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REMEDIAL INVESTIGATION REPORT FOR OPERABLE UNIT 2 ***FINAL*** - JANUARY 21, 1995 - VOLUME 3 OF 6 - BASELINE RISK ASSESSMENT

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REPORT

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REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

REMEDIAL INVESTIGATION REPORT OPERABLE UNIT 2

Volume 3 of 6
Baseline Risk Assessment
January 21, 1995

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

REMEDIAL INVESTIGATION REPORT FOR OPERABLE UNIT 2

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

VOLUME 3 OF 6
BASELINE RISK ASSESSMENT

JANUARY 21, 1995

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

FINAL

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ACRONYMS AND ABBREVIATIONS

a	Adult (in exposure parameter tables)
ACGIH	American Conference of Government Industrial Hygienists
ASI/IT	Advanced Sciences Incorporated/International Technology
AT	Averaging time
ATDSR	Agency for Toxic Substances and Disease Registry
BEIR	Biological Effects of Ionizing Radiation
°C	degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF	Conversion Factor
CFR	Code of Federal Regulations
CH	Chlorinated Hydrocarbons
CIS	Characterization Investigation Study
CNS	Central Nervous System
CLP	Contract Laboratory Program
CPC	Constituent of Potential Concern
COC	Contaminant of Concern
cpm	counts per minute
CRARE	Comprehensive Response Action Risk Evaluation
CRU2	CERCLA/RCRA Unit 2
CSM	Conceptual Site Model
CT	Central Tendency
Cu	Copper
DCR	Document Change Request
DOE	United States Department of Energy
DOE-FN	United States Department of Energy - Fernald Field Office
dpm	disintegrations per minute
DQO	data quality objective
DVS	Data Validation Support
ECAO	Environmental Criteria and Assessment Office
ED	Exposure duration
EF	Exposure frequency
EPA	United States Environmental Protection Agency
ERMC	Environmental Restoration Management Contractor
ES	Environmental Survey
Fe	Iron
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Company
FI	Fraction ingested
FS	Feasibility Study
ft.	foot, feet
µg/L	microgram/liter
GI	Gastrointestinal
HCl	Hydrochloric Acid
HEAST	Health Effects Assessment Summary Tables

ACRONYMS AND ABBREVIATIONS
(Continued)

HI	Hazard Indices
HQ	Hazard Quotient
I	Intake
IARC	International Agency for Research on Cancer
ICRP	International Commission on Radiological Protection
ILCR	Incremental Lifetime Cancer Risk
in.	inch(es)
IR	Ingestion rate
IRIS	Integrated Risk Information System
ISCLT2	Industrial Source Complex Long-Term dispersion model
Kg	Kilogram
L	liter
LOAEL	lowest observed adverse effect level
LSP	Lime Sludge Ponds
mL	milliliter
Mn	Manganese
MSL	Mean sea level
mtu	metric tons uranium
MUSLE	Modified Universal Soil Loss Equation
NaOH	Sodium Hydroxide
NOAEL	No observed adverse effect level
NOEL	No observed effect level
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
OAC	Ohio Administrative Code
oc	Older child (in Exposure Parameter Table)
OEPA	Ohio Environmental Protection Agency
ORD	Office of Research and Development
OSHA	Occupational Safety and Health Administration
OU 1	Operable Unit 1
OU 2	Operable Unit 2
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyl
pCi/g	picocuries per gram
ppb	parts per billion
PPE	Personal Protective Equipment
PAH	Polynuclear Aromatic Hydrocarbons
PSP	Project Specific Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAWPA	Risk Assessment Work Plan Addendum
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation

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ACRONYMS AND ABBREVIATIONS
(Continued)

RI/FS	Remedial Investigation/Feasibility Study
RM	River Mile
RME	Reasonable Maximum Exposure
SAP	Sampling and Analysis Plan
SAS	Statistical Analysis Software
SQL	Sample Quantification Limits
SR	State Road
SVOC	Semi-Volatile Organic Compound
TCLP	Toxicity Characteristics Leaching Procedure
TEF	Toxicity Equivalency Factor
TF	Toxicity Factor
TLD	Thermoluminescent Dosimeter
TOC	Total Organic Carbon
TOX	Total Organic Halogen
TPH	Total Petroleum Hydrocarbon
TSS	Total Suspended Solids
UBK	Uptake/Biokinetic
UCL	Upper Confidence Limit
USDA	United States Department of Agriculture
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
WRS	Wilcoxon Rank Sum
yc	young child (used in Exposure Parameter tables)
Zn	Zinc

B.1.0 INTRODUCTION

B.1.1 OBJECTIVES AND SCOPE

This appendix contains the Baseline Risk Assessment for Operable Unit 2 at the U. S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP). The baseline risk assessment is part of the Operable Unit 2 Remedial Investigation (RI) report and will also support the Feasibility Study (FS) and Comprehensive Response Action Risk Evaluation (CRARE) for Operable Unit 2. Operable Unit 2 is one of five operable units at the FEMP. It includes the Active Flyash Pile, South Field, Inactive Flyash Pile, Solid Waste Landfill, and Lime Sludge Ponds, as well as the berms, liners, and soil within the operable unit boundaries. These are termed subunits throughout this document.

The primary objective of this baseline risk assessment is to evaluate and document the potential threats to human health that may be posed by current and predicted future exposures to contaminants within Operable Unit 2 if no remedial action is taken. If estimated risks indicate that remedial action is desirable, the baseline risk assessment provides the framework for developing risk information to assist in developing remedial alternatives for Operable Unit 2.

The specific objectives of this baseline risk assessment are to:

- Determine constituents of potential concern (CPC) for environmental media for each subunit within Operable Unit 2.
- Quantify the potential human health risk associated with each individual subunit within Operable Unit 2, due to contaminants of concern (COCs) using Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) methodology, assuming no remedial actions are taken.
- Provide a basis for determining whether remediation of specific subunits within Operable Unit 2 is necessary.
- Identify specific contaminants, areas, and environmental media within subunits for which cleanup is appropriate.
- Provide a basis for determining cleanup levels and criteria.
- Provide a "baseline" of potential health risks for the no-action scenario in the FS for Operable Unit 2 as well as for the CRARE.

An additional objective of this baseline risk assessment is to demonstrate responsiveness to comments made by the U. S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA) on previous risk assessments submitted for the FEMP site. In particular, this risk assessment is intended to be responsive to comments from the EPA on the Operable Unit 2 Risk Assessment and RI dated December 17, 1992 and EPA comments on the Operable Unit 4 Risk Assessment submitted June 17, 1993 (DOE 1993b).

The Operable Unit 2 risk baseline assessment addresses only the potential risks associated with waste subunits within the boundaries or battery limits of Operable Unit 2. Subunit battery limits are defined in Section 1.6 of this report. The Operable Unit 2 baseline risk assessment does not consider existing contamination in groundwater, surface water, sediment, or soil unless it is contained within the battery limits of Operable Unit 2. Therefore, risk quantified in this baseline risk assessment represents only a portion of the total risk posed by the FEMP site. Total cumulative risk from all operable units will be addressed in the final CRARE prepared for Operable Unit 5. Risks due to existing groundwater contamination outside the battery limits of Operable Unit 2 will be evaluated as part of Operable Unit 5.

In accord with an agreement between EPA Region V and DOE, ecological risks (impacts on flora and fauna) are not addressed in the Operable Unit 2 RI report. Baseline ecological risks for the FEMP site will be addressed in the site-wide ecological risk assessment to be submitted as part of the Operable Unit 5 RI/FS. The site-wide ecological risk assessment will address only on-site and off-site areas not likely to be remediated on the basis of human health concern. Since significant areas within Operable Unit 2 are likely to be remediated based on human health concerns, ecological risks are not evaluated in this Operable Unit 2 RI. The potential impacts to ecological receptors associated with implementation of remedial alternatives will be considered in the Operable Unit 2 FS.

B.1.2 OVERVIEW

Using the data collected during RI investigations, this baseline risk assessment is conducted for each of the five subunits present within Operable Unit 2. This facilitates remedial decisions for each source area. The same general exposure scenarios are evaluated for each subunit. This maintains consistency in the underlying basis of risk estimates across subunits within Operable Unit 2.

To assist in evaluating the possible impacts of releases of constituents on human health, the general conceptual site model (CSM) for Operable Unit 2 contained in this risk assessment emphasizes potential migration of constituents from waste areas to environmental media contacted by potential receptors. Both current and future land use scenarios are considered in identifying potential receptors. The purpose of the CSM is to illustrate and describe the most current understanding of the sources of constituents within Operable Unit 2; the types of constituents present; constituent release and transport mechanisms; affected and potentially affected media; known and potential routes of constituent migration; and known and potential human receptors. This information clarifies which environmental media and specific human receptors need to be addressed to adequately characterize risk resulting from waste areas within Operable Unit 2. This in turn allows for the initial grouping of data into subsets relevant to quantitatively assessing risk.

The Risk Assessment Work Plan Addendum established that, at a minimum, the following three land use designations should be addressed in operable unit risk assessments: current land use with active access controls; current land use without access controls; and future land use without access controls, reasonable maximum exposure (RME). In addition to these three land use scenarios, two additional scenarios have been included in previously submitted operable unit risk assessments. These scenarios are: future land use with passive access controls; and future land use without access controls, central tendency (CT) exposure.

The future land use with passive access controls scenarios assumes the government owns the property but does not maintain access control with security personnel or active sensors. A fence is assumed to surround the site and the public is assumed to be off-property. This scenario includes the assessment of future risks assuming receptors are off-property with the exception of an expanded trespasser receptor, who has access to the property. The second additional scenario has been added in response to guidance from the EPA suggesting that all risk assessments provide an evaluation of the CT of the risk range. The recent guidance (EPA 1992c and EPA 1992d) suggests adding a set of risk descriptors for the CT of the risk range at all Superfund sites, using the best information available to describe the average situation.

For this risk assessment, land use assumptions and receptors were selected to ensure that they are consistent with the Risk Assessment Work Plan Addendum (DOE 1992a) where still applicable; they allow adequate quantification of risk for every contaminated, or potentially contaminated, medium

within each subunit; and they are consistent with draft FEMP risk assessment guidelines for exposure scenarios (most recent version is dated October 19, 1993). These land use assumptions and receptors, which provide the framework for the quantitative estimates of risk, are described in detail in Section 2.0 of this RI report.

Environmental sampling data collected from Operable Unit 2 during both phases of the RI field investigation were used in this risk assessment. Once the data set was complete, statistical methods were used to evaluate the analytical results from each waste area in order to: (1) identify CPCs specific to the waste areas, (2) develop waste area specific source term concentrations for fate and transport modeling, and (3) establish waste area specific exposure point concentrations of potential receptor locations. The detailed CPC selection process is described in Section 2.0 of this RI report.

B.1.3 RISK ASSESSMENT GUIDANCE

This baseline risk assessment follows the guidance available from EPA as of September 1993. In accordance with the 1991 Amended Consent Agreement between EPA and DOE , the methodology presented in the Risk Assessment Work Plan Addendum (DOE 1992a) was prepared to establish specific risk assessment methodology to be followed in all RI/FS risk assessments for the FEMP. The Risk Assessment Work Plan Addendum is based primarily on the following EPA guidance and databases:

- Risk Assessment Guidance for Superfund (EPA 1989a)
- Exposure Factors Handbook (EPA 1989c)
- Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Volume I, Supplemental Guidance, Standard Default Exposure Factors, Interim Final (EPA 1991b)
- Health Effects Assessment Summary Tables (HEAST) (EPA 1993b).

B.1.4 ORGANIZATION OF BASELINE RISK ASSESSMENT

Section B.1.0 contains an overview of the purpose for this baseline risk assessment, the scope of the assessment, the guidance used in preparing the risk assessment, and describes Operable Unit 2 history and site conditions.

Section B.2.0 contains the general methodology used in preparing the baseline risk assessment for Operable Unit 2. Within this section, the methodology for the following analyses are discussed:

- Risk Assessment Workplan Addendum (Section B.2.1)
- Refinement of Conceptual Site Model (Section B.2.2)
- Evaluation of Data and Identification of Constituents of Potential Concern (Section B.2.3)
- Exposure Assessment (Section B.2.4)
- Toxicity Assessment (Section B.2.5)
- Risk Characterization (Section B.2.6).
- Uncertainty Analysis (Section B.2.7)

The methodology and processes discussed in Section B.2.0 are common to all subunits within Operable Unit 2 and repeated as the risk associated with each subunit is evaluated and quantified.

Section B.3.0 present the results of the analyses described in Section B.2.0. The section is organized so that the results for each subunit are presented individually, in addition to results of cumulative risk posed by Operable Unit 2 as a whole.

Section B.4.0 summarizes the results and discusses their significance. Uncertainties are re-emphasized to explain the accuracy of the risk estimates and to assist in risk management decisions.

Section B.5.0 presents the references used in preparing this baseline risk assessment.

Finally, the following attachments are appended to this report:

- Attachment B.I — Description and Results of Indoor Radon Modeling
- Attachment B.II — Toxicity Profiles
- Attachment B.III — Intake and Risk/Hazard Results

B.1.5 OVERVIEW OF OPERABLE UNIT 2 BACKGROUND

A detailed description of the FEMP site background and history is provided in Section 1.0 of this RI report.

Operable Unit 2 was defined as a functional unit to efficiently address the remediation of waste subunits with relatively large volumes of waste but presumed to contain small quantities of hazardous materials and radionuclides. Operable Unit 2 includes the following individual areas:

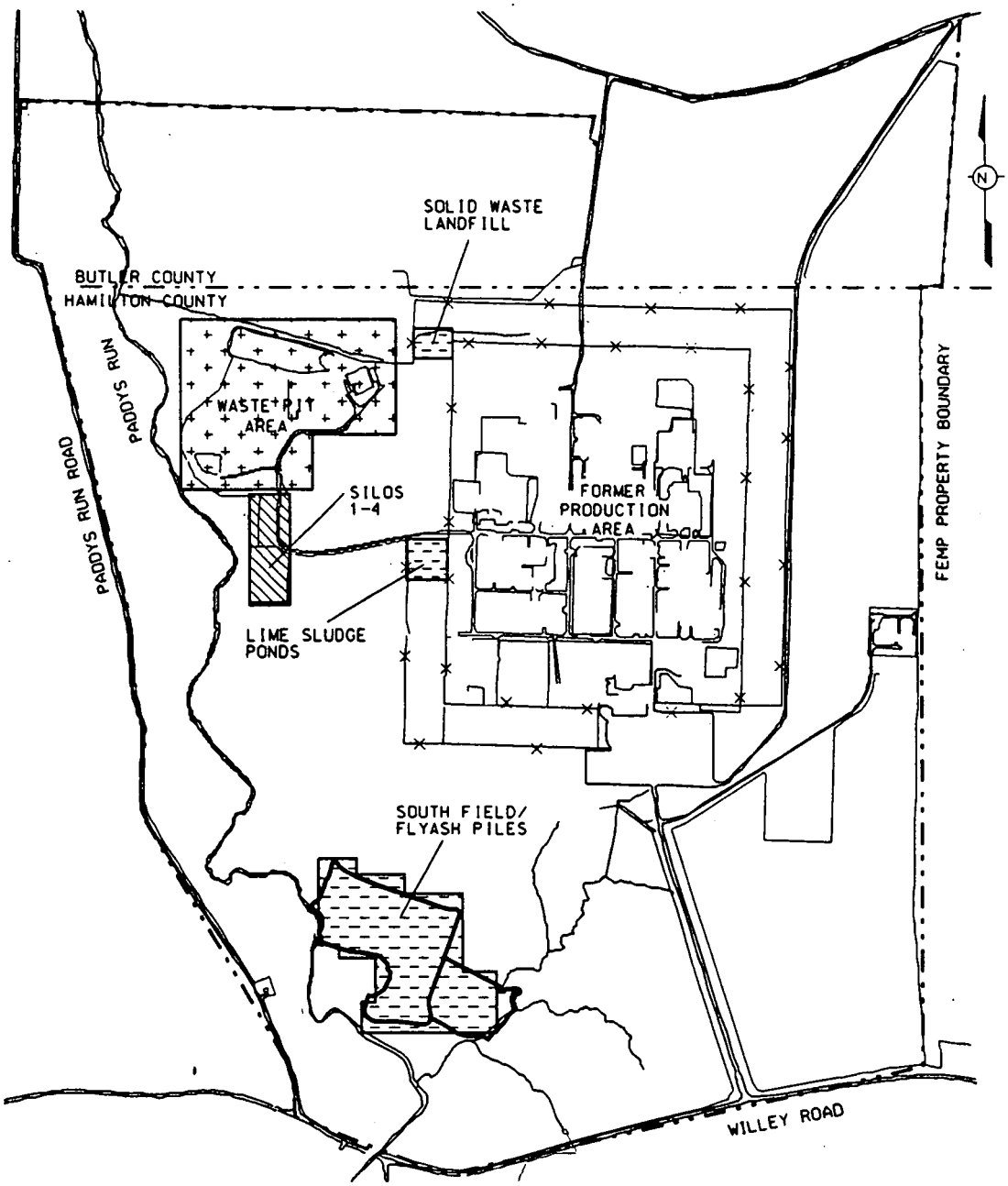
- Solid Waste Landfill
- North and South Lime Sludge Ponds
- South Field
- Inactive Flyash Pile
- Active Flyash Pile

The locations of the Operable Unit 2 areas within the Fernald site are presented in Figure B.1-1. The Solid Waste Landfill is located on a small tract at the northeast corner of the Waste Storage Area (Figure B.1-1). The landfill occupies approximately one acre of land and is covered by a layer of soil. The total estimated volume of fill in the landfill is about 14,400 cubic yards. Materials reported to have been disposed at the landfill include bagged trash and wood; respirator cartridges, asphalt roofing materials, medical wastes, firehoses, and rubber hoses/belts; and medicine vials, bagged asbestos, ceramic tiles, magnesium fluoride, glass acid bottles, steel cables/cans, paint cans, and copper tubing.

The North Lime Sludge Pond is an active unlined pond located southeast of the Waste Storage Area (Figure B.1-1). The approximate dimensions of sludge in the pond are 125 feet by 225 feet by 5.3 feet deep, with a total volume of approximately 5000 cubic yards, not including berms. This pond is approximately 90 percent full and is partially covered with water. This pond contains an estimated 150,000 gallons of water with a depth that varies to 7 feet and an average depth of 2 to 3 feet. Spent lime sludges (primarily lime-alum and boiler blowdown) from the FEMP water treatment plant operations are conveyed to this pond.

The South Lime Sludge Pond is an inactive unlined pond located southeast of the Waste Storage Area (Figure B.1-1). The South Lime Sludge Pond is 125 feet by 225 feet by 11.2 feet deep, with a total volume of approximately 10,000 cubic yards, not including berms. This pond was retired in the mid-1960s and is now overgrown with grass. The use of this pond was similar to that of the North Lime Sludge Pond.

The Inactive Flyash Pile is located approximately 2,000 feet south/southeast of the Waste Storage Area (Figure B.1-1). The pile occupies approximately two acres. It is west of and contiguous to the



LEGEND

- OPERABLE UNIT 1
- OPERABLE UNIT 2
- OPERABLE UNIT 4

SCALE

0 1200 2400 FEET

NOTE

OPERABLE UNIT 3 INCLUDES ALL BUILDINGS, PIPELINES, AND ABOVEGROUND STRUCTURES IN THE FORMER PRODUCTION AREA. OPERABLE UNIT 5 INCLUDES GROUNDWATER, SURFACE WATER, SOILS, SEDIMENTS, FLORA AND FAUNA IN THE REGIONAL AREA AS WELL AS THE FORMER PRODUCTION AREA.

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FIGURE B.1-1
RI/FS OPERABLE UNITS

South Field without clear definition of the two subunits. Based on information provided by WEMCO, 1500 to 2000 tons per year of flyash were generated during the period of disposal (1952 to 1968).

The South Field is located between the Inactive Flyash Pile and the Active Flyash Pile, where construction rubble was deposited on the surface of the glacial overburden (Figure B.1-1). The thickness of the fill increases at the western and southern edges of the area to approximately 25 feet because material was dumped down the natural slope of an old meander scar. The fill volume is estimated to be approximately 109,000 cubic yards. A review of the shallow trenches through the fill indicates that the material is predominantly soil with some rock and concrete and only occasional pieces of wood. The construction rubble deposited in the South Field contains low levels of radioactive materials (DOE 1993d).

The Active Flyash Pile received flyash from the coal-fired boiler plant at the FEMP until December 1992. This disposal area is located east of and adjacent to the South Field (Figure B.1-1). The Active Flyash Pile has an area of approximately 100,000 square feet with an approximate maximum depth of fill of 38 feet, and it contains approximately 64,600 cubic yards of flyash. Active Flyash Pile waste is comprised of 70 percent bottom ash collected below the boilers, and the remaining 30 percent is a combination of precipitator ash collected from pollution control devices and flyash removed from the middle levels of the boiler. Some unburned coal and rock are also present in small quantities in the Active Flyash Pile material. The newly generated flyash is currently being transported off site to a licensed disposal facility.

Investigation activities conducted in the Operable Unit 2 subunit are discussed in Section 3.0 and nature and extent of contamination within each subunit is presented in Section 4.0 of this report.

B.2.0 METHODOLOGY

This baseline risk assessment addresses only the potential risks posed by constituents in, and migrating from, the waste areas of Operable Unit 2. Parameters and equations used to calculate risks and hazards are presented in Sections B.2.3, B.2.4, and B.2.5. The Risk Assessment Work Plan Addendum (DOE 1992a) provides detailed descriptions of methodology used for FEMP baseline risk assessments. This methodology is based on the four primary steps of risk assessment described in EPA guidance: (1) identification of constituents of potential concern; (2) exposure assessment; (3) toxicity assessment; and (4) risk characterization. Exposure assessment methodology, assumptions, values, and relative information is presented in Section B.2.0.

The methodology described in the Risk Assessment Work Plan Addendum (DOE 1992a) has been followed in this risk assessment with the modifications and enhancements noted below. These changes reflect responsiveness to comments from the EPA and OEPA on previous FEMP risk assessments; efforts to establish a consistent approach to risk assessments across all operable units and across all risk assessment related deliverables (e.g., RI operable unit baseline risk assessments, FS risk assessments, and CRAREs); and updates in EPA risk assessment guidance.

To make judgements and remedial decisions about each specific subunit within Operable Unit 2, a risk assessment for each subunit was performed independently and for all subunits together. Since the general methodology followed for the risk assessment is the same, it is summarized once in this section, then applied repeatedly to each assessment to obtain the results presented in Section B.3.0. Figure B.2-1 presents a flow diagram of the FEMP risk assessment process. Significant features of that methodology are summarized below after first noting the changes from the Risk Assessment Work Plan Addendum (DOE 1992a) incorporated into this risk assessment.

B.2.1 CHANGES FROM THE RISK ASSESSMENT WORKPLAN ADDENDUM

Changes to the methodology described in the Risk Assessment Work Plan Addendum (DOE 1992a) incorporated into this risk assessment are as follows:

1. Source-term concentrations based on measurement data from small sample populations (less than seven samples) are calculated using the maximum value detected.

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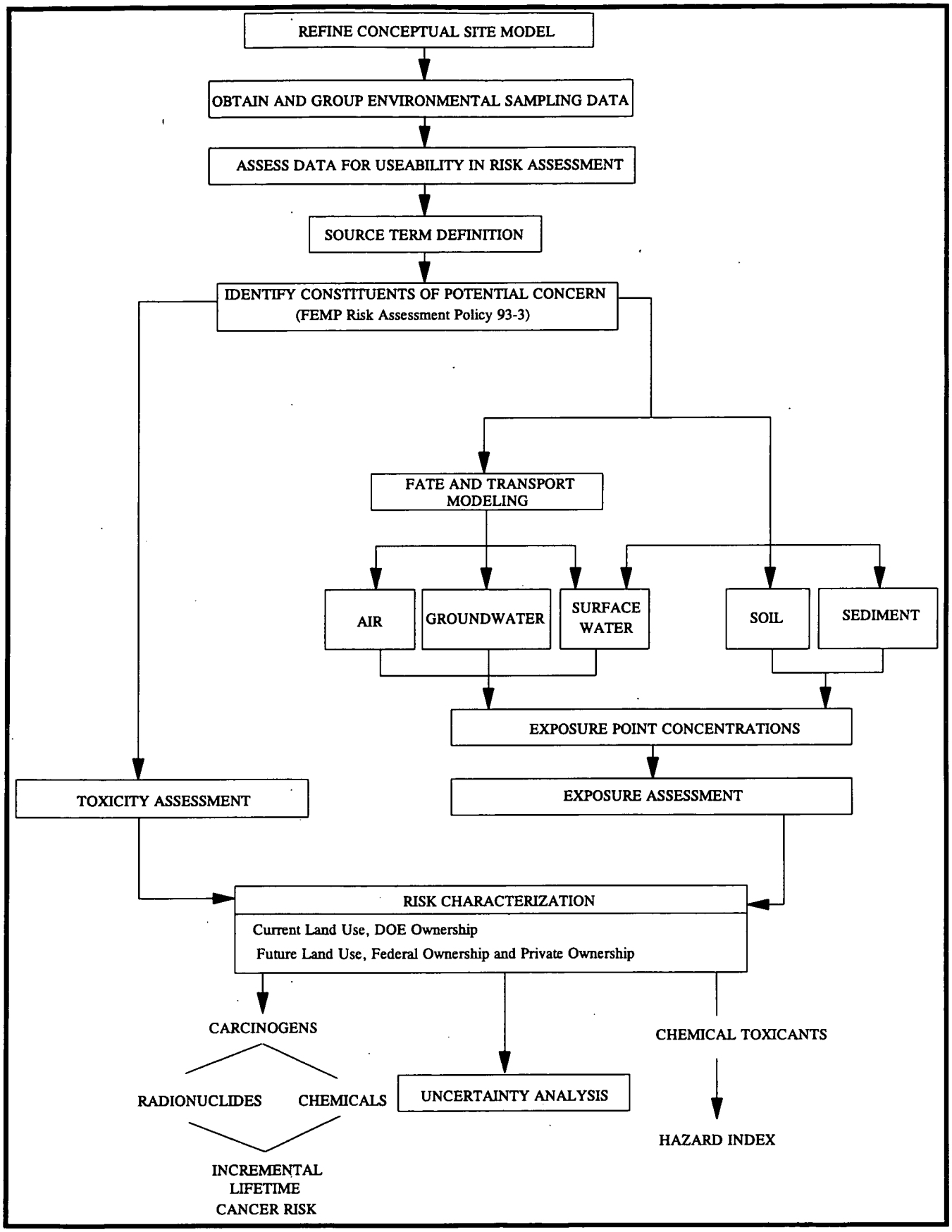

FIGURE B.2-1. FEMP RISK ASSESSMENT PROCESS

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Justification: With a small data set, the distribution of concentration data often cannot be adequately assessed. Without knowing the proper distributional assumptions, it is not valid to calculate the 95 percent UCL.

2. The selection of CPC, which is the subset of constituents determined to be present above background, is performed using traditional statistical methods including the Students t-test and the Wilcoxon Rank Sum test, except when these tests cannot be validly applied. A comparison of each site related measurement to the 95th percentile of background data is also performed on sample sets less than 30 for the purposes of identifying CPCs which may have been "averaged out" by the statistics. Details of these statistical methods are discussed in Section B.2.3.5.1.

   Justification: The comparison of detected concentrations to the 95th percentile of the background ensures that constituents potentially present above naturally occurring levels will not be ruled out as CPCs.

3. The selection of CPCs, which is the subset of detected constituents that is carried through the risk assessment, followed a systematic approach recently approved by EPA for use at this site. This approach is described in detail in Section B.2.3.

   Justification: This approach facilitates a consistent, statistically and toxicologically defensible approach to selecting constituents for which risk will be quantified.

4. Background soil data from literature sources are replaced with data from the March 1993 CERCLA/RCRA Background Soil Study (DOE 1993f).

   Justification: Site-specific background soil data provides a more accurate measure of background concentrations.

5. Airborne particulate concentrations of constituents are calculated using the Industrial Source Complex Long Term (ISCLT2) dispersion model (EPA 1992b).

   Justification: The ISCLT2 dispersion model is one of the EPA's guideline models. It is a sector-averaged, Gaussian plume model capable of calculating seasonal or annual ground level constituent concentrations in suspended particulates. The ISCLT2 model predicts concentrations at grid points set by the user and has the capability to model multiple release sources. The model contains a number of options, allowing the user to make the model more site-specific.

6. The Andelman Model (Andelman 1990) for modeling volatile releases to air from water used in the home is used in the risk assessment.

   Justification: Use of the Andelman Model reflects the most recent EPA guidance for evaluation of the pathway involving inhalation of volatiles released to air from water used in the home.

7. Slope factors for radionuclides are taken from HEAST Annual Fiscal Year (FY) 1993 (EPA 1993b).

Justification: HEAST is updated regularly. The Operable Unit 2 risk assessment uses the most up-to-date HEAST as of October 1993.

8. Risks to an off-property resident farmer receptor for future exposure scenarios are presented.

   Justification: An off-property resident farmer may be exposed to site-related constituents via air transport and migration to the Great Miami Aquifer. The risk assessment for this receptor was specifically requested by EPA in the comment resolution for the Site-Wide Characterization Report (DOE 1992c).

9. Risks due to "average" exposure conditions (in addition to "reasonable maximum" exposure conditions) for the future on-property resident farmer are included.

   Justification: Additional EPA guidance on risk assessment issued in February 1992 (a memorandum from EPA's Deputy Administrator, F. H. Habicht, to EPA's Assistant and Regional Administrators concerning guidance on risk characterization for risk managers) (EPA 1992c) urges risk assessors to address or provide descriptions of individual risk that include the "high end" portions and CT of the risk distribution. Because future on-property resident farmers constitute a very important subgroup for risk estimates at the FEMP, this exposure scenario is selected to present both RME and CT estimates of risk.

10. Dermal contact models and parameters have been revised to reflect the most recent guidance from the EPA (EPA 1992f).

    Justification: The DOE has agreed to employ the most recent dermal exposure assessment guidance from the EPA in operable unit-specific risk assessments.

11. A drinking water pathway assuming domestic use of perched groundwater is quantitatively evaluated where applicable.

    Justification: Hydrogeological data within two Operable Unit 2 subunits (Lime Sludge Ponds and Solid Waste Landfill) indicate the presence of perched groundwater. Assessment of potential risk due to domestic use of this water should provide the highest upper bound estimate of risk due to groundwater at these subunits.

12. The soil ingestion rate for the on-property and off-property farmer is adjusted for an age and occupation specific soil ingestion rate.

    Justification: A site-specific soil ingestion rate is developed to replace the value in the Risk Assessment Work Plan Addendum (DOE 1992a).

13. The inhalation rate for the on-property resident child is replaced by a value that more closely reflects the physiology of a young child.

    Justification: During ERA review of FEMP Operable Unit 4 RI Report, DOE has agreed to modify the inhalation rate for the on-property resident child. The adult inhalation rate used previously is replaced by a value that is more appropriate for the resident child receptor.

14. CPCs were not evaluated separately for target organ effects when evaluating exposure to systemic toxicants.

    Justification: Target organ effects and mode of action were not considered separately for systemic toxicants because hazard indices (His) were low (typically less than 1). Therefore, the concern for consideration of target organ effects and mode of action are not of concern for evaluation of potential systemic toxicity.

15. The removal processes considered to predict concentrations in food include the effects of leaching in addition to the radioactive and chemical decay presented in the Risk Assessment Work Plan Addendum. This is presented in more detail in the section in Section B.2.0.

    Justification: During irrigation and aerial deposition, constituents are added to the soil. Simultaneously, radioactive decay, chemical degradation, and soil leaching deplete these constituents. The methodology set forth in the Risk Assessment Work Plan Addendum effectively calculates radioactive decay and chemical degradation, but approximated the effect of leaching by calculating plant concentrations after 70 years of deposition/irrigation. This approach is appropriate for most chemicals and radionuclides at the site. However, this approach overestimates the concentrations of very mobile constituents such as technetium-99. An updated methodology, based on work published in National Council on Radiation Protection (NCRP) Report No. 76 (NCRP 1984c) and Commentary No. 3 (NCRP 1989) has been adopted to more accurately represent the physical processes at the site.

B.2.2 REFINEMENT OF CONCEPTUAL SITE MODEL (CSM)

To assist in evaluating the possible impacts of releases of constituents on human health, the general CSM of the Operable Unit 2 site has been refined to emphasize current understanding of constituent migration and potential exposures at Operable Unit 2. Both current and future land use scenarios are considered. The overall purpose of the model is to illustrate and describe the sources of constituent within Operable Unit 2; constituent release and transport mechanisms; impacted and potentially

impacted media; and known and potential human receptors. This information helps to clarify which environmental media and specific human receptors need to be addressed to adequately characterize risk resulting from waste areas within Operable Unit 2. This in turn is critical for the initial grouping of data into subsets relevant to assessing risk so that independent risk-based decisions can be made for each subunit. Refinement of the CSM is therefore an important first step in completing the baseline risk assessment.

The CSM for Operable Unit 2 is depicted in Figure B.2-2. It shows the five waste areas that are the sources of constituents, as well as the secondary sources (groundwater, soil) impacted by migration of constituents from these source areas and is based on the current understanding of Operable Unit 2 RI activities. Nature and extent of contamination in the source areas is described in Section 4.0 of this RI. Potential transport and release mechanisms and impact of receiving media (i.e., air, groundwater, and surface water) in the future is described in Section 5.0. This section of Appendix B emphasizes those parts of the CSM describing current and potential future land use on and around the FEMP site, as well as the exposure pathways via which human receptors may contact impacted media associated with each of the Operable Unit 2 subunits.

Identification of exposure scenarios is dependent on the physical characteristics of the site; the identification of applicable land use scenarios; and identification of populations of concern under both current and future land use configurations.

Populations of concern are identified for a reasonable area of impact considering site-specific environmental conditions such as the results of site characterization, environmental monitoring, constituent fate and transport modeling, and the nature of potential exposure pathways. Subpopulations, such as young children, that could be exposed to increased risk as a result of behavior or increased sensitivity are also identified.

Potential receptors are further characterized according to the degree of potential exposures. In accordance with EPA guidance, risk estimates for receptor populations are developed on the basis of RME conditions. RME conditions can reasonably be expected to occur under current and future land use scenarios, and are defined by conservative exposure parameters. The RME is intended to represent a conservative exposure case that is above the average estimated exposure level. The

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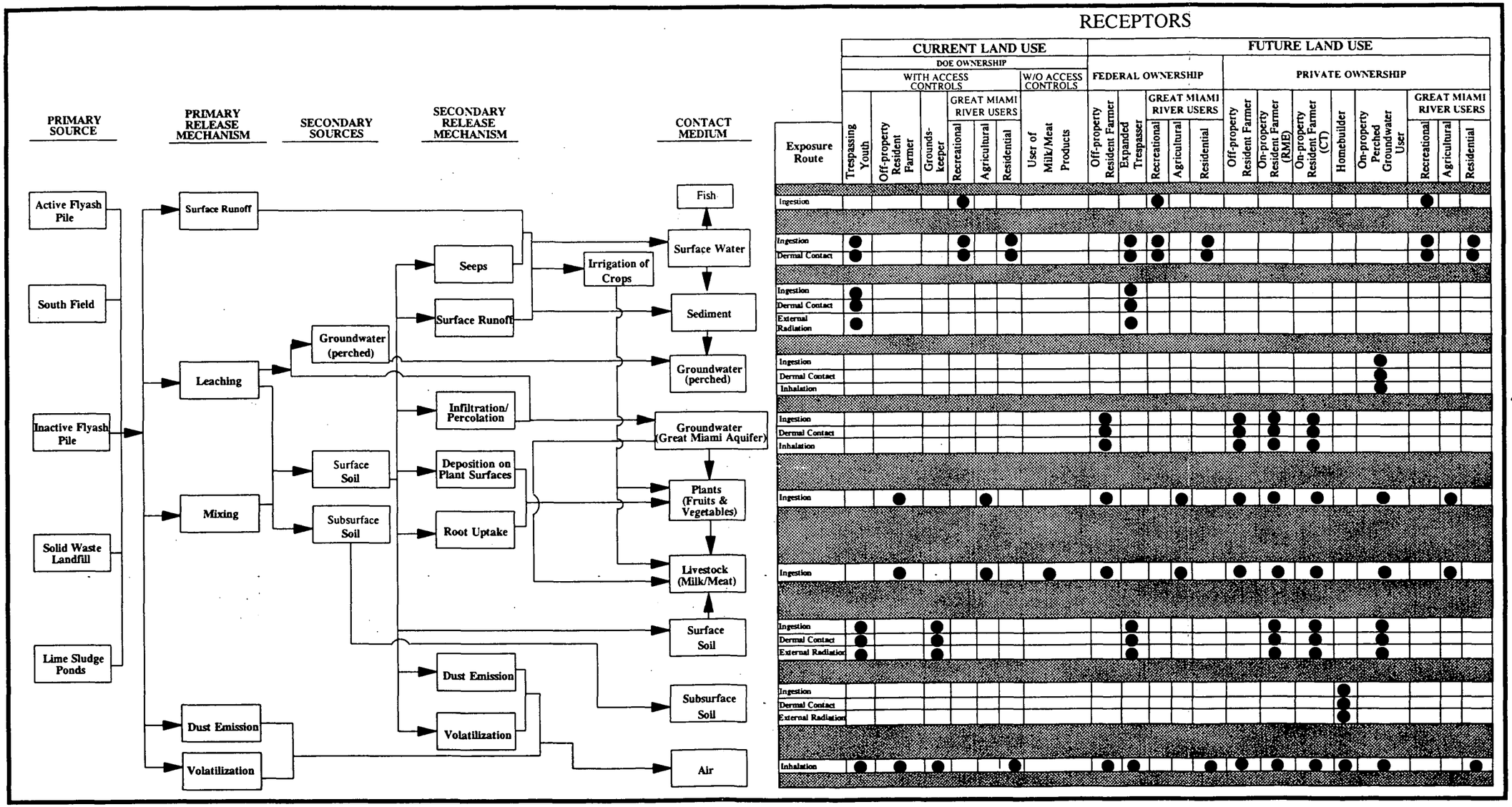

FIGURE B.2-2 GENERAL CONCEPTUAL SITE MODEL/OPERABLE UNIT 2

Operable Unit 2 baseline risk assessment is based on RME assumptions for each potential receptor exposure scenario evaluated.

The baseline risk assessment also evaluates more typical exposure conditions by utilizing a CT analysis for a selected receptor. This CT analysis utilizes mostly average exposure parameters and therefore represents a less conservative exposure case than the RME receptor.

Land use designations and exposure scenarios illustrated in Figure B.2-2 are described in the following sections.

B.2.2.1 Land Use

Potential exposures to the environmental media noted on Figure B.2-2 are evaluated in the context of four land use configurations: (1) current land use assuming DOE ownership with access control, (2) current land use assuming DOE ownership without access control, (3) future land use assuming federal ownership, and (4) future land use assuming private ownership. These land use configurations reflect the current framework for assessing risk at the FEMP. As indicated in the CSM, the receptors assuming access controls are trespassing youths, off-property residents, on-property groundskeeper, Great Miami River users under recreational, agricultural, and residential uses, and users of meat and milk products; future receptors assuming federal ownership are expanded trespassers and off-property residents; and future receptors assuming private ownership are on-property farmers, off property farmers, homebuilders, perched groundwater users, and Great Miami River users under recreational, agricultural, and residential uses.

These receptors differ slightly from what is described in the Risk Assessment Work Plan Addendum (DOE 1992a). The Risk Assessment Work Plan Addendum established that, at a minimum, the following three land use scenario should be addressed in operable unit risk assessments: (1) current land use with active access controls; (2) current land use without access controls; and (3) future land use without access controls.

In addition to the above land use scenarios, two additional scenarios have been requested by EPA and included in previously submitted operable unit risk assessments. These scenarios are: future land use with passive access controls (continued federal ownership); and future land use without access controls (private ownership), with CT exposure. The future land use with passive access controls

scenarios describes a scenario where the government owns the property but does not maintain access control with security personnel or active sensors. A fence is assumed to surround the site and the public is assumed to be off-property. The second additional scenario was added in response to new guidance from the EPA suggesting that all risk assessments provide an evaluation of the CT of the risk range. The recent guidance (EPA 1992c and EPA 1992d) suggests adding a set of risk descriptors for the CT of the risk range at all Superfund sites, using the best information available to describe the average situation. All other exposure scenarios in this risk assessment are based on RME input parameters.

For this risk assessment, land use assumptions and receptors were selected to ensure: 1) they are consistent with the Risk Assessment Work Plan Addendum (DOE 1992a) where still applicable; 2) they allow adequate quantification of risk for every contaminated, or potentially contaminated, medium within each subunit; and 3) they are consistent with FEMP risk assessment guidelines for exposure scenarios. Table B.2-1 summarizes land use and receptor designations outlined in the Risk Assessment Work Plan Addendum (DOE 1992a) and compares them to equivalent receptors from the previously submitted Operable Unit 2 risk assessment, as well as receptors identified in this risk assessment. This table illustrates that even though the descriptions of land use and exposure scenarios have undergone changes in terminology the important potential exposures are consistently evaluated.

B.2.2.2 Exposure Scenarios

Table B.2-2 summarizes land use and receptor designations utilized to quantify risk in this baseline risk assessment. The scenarios described in Table B.2-2 are those listed in the far right column of Table B.2-1.

B.2.2.2.1 Current Exposure Scenarios

Under the current land use scenarios, the FEMP is evaluated with and without access controls assuming present site operations. In addition, no remedial action is assumed to have been taken beyond that already accomplished.

Existing access controls at and in the vicinity of Operable Unit 2 limits the possible receptors exposed under current land conditions. The receptor most likely to be exposed to constituents on and migrating from Operable Unit 2 waste areas are trespassers who may routinely bypass existing controls and enter the site; off-property farm families who may live in the vicinity of the FEMP

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TABLE B.2-1

EXPOSURE SCENARIOS CONSIDERED AND SELECTED FOR EVALUATION

Land Use[1]	RAWPA Receptor (June 1992)[1]		Potentially Contaminated Media Contacted	Quantified In Current OU2 Risk Assessment?/Reason	Operable Unit 2 Receptor
Current/Access Controls (Assumes current land use of FEMP property will continue under DOE ownership)	Visitor (regular visitor to FEMP or OU)		OU-specific	no/visitors to OU2 not anticipated; incidental exposures to contaminated media evaluated in other scenarios	NE
	Trespasser (remaining near fence or property line)		surface soil air surface water/sediment	yes/incidental exposures possible	current trespassing youth
	Exploring child (aged 6-17)		sediment in Paddy's Run	yes/exposures to sediment evaluated with trespasser scenario	current trespassing youth
	Off-property farmer (at property boundary)		surface soil air home-grown produce beef/milk from livestock grazing off FEMP property	yes/represents RME scenario for current land use	current off-property farmer (adult and child), livestock grazing off-property
	On-property grazing		beef/milk from livestock grazing on FEMP property	no/equivalent exposures evaluated with future land use, without federal ownership, on-property farmer scenario and with current/no access controls	NE
	Groundskeeper		soil sediment air	yes/assumes exposure to on-property maintenance worker not covered by FEMP health & safety and radiiological program	current on-property groundskeeper
	Great Miami River User	Recreational User	surface water fish	yes/evaluates potential risk to recreational GMR user	estimated surface water concentrations in GMR
		Agricultural User		yes/evaluates potential risk to agricultural users of GMR	estimated surface water concentrations in GMR
		Residential User		yes/evaluates potential risk to household users of the GMR	estimated surface water concentrations in GMR

See footnotes at end of table

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TABLE B.2-1
(Continued)

Land Use[1]	RAWPA Receptor (June 1992)[1]	Potentially Contaminated Media Contacted	Quantified In Current OU2 Risk Assessment?/Reason	Operable Unit 2 Receptor
Current/No Access Controls (Assumes environmental restoration of the property has ceased and present access restrictions are discontinued)	Visitor (regular visitor to FEMP or OU)	OU-specific	no/visitors to OU2 not anticipated	NE
	Trespasser (moving throughout property)	surface soil air surface water/sediment	yes/incidental exposures possible	current trespassing youth
	Exploring child (aged 6-17)	surface soil air	yes/exposures evaluated with current trespassing youth scenario	current trespassing youth
	Off-property farmer (at property boundary)	surface soil air homegrown produce beef/milk from livestock grazing on FEMP property	yes/but assuming livestock grazing on-property	future off-property farmer (adult and child), livestock grazing on-property
	On-property grazing	beef/milk from livestock grazing on FEMP property	yes/on-subunit grazing is possible	user of meat and milk products
	On-property building user	surface soil/waste material	no/no buildings within OU2	NE
	Hunter	surface/subsurface soil air animal products from wild animals currently on FEMP property	no/hunting exposures unlikely; equivalent exposures to potentially contaminated media evaluated with trespasser and farmer scenarios	NE
Future (assumes reasonable future land uses of the property; no access controls)	Resident farm family	surface soil air groundwater (Great Miami aquifer) homegrown produce beef/milk from livestock grazing on FEMP property	yes/represents worst case scenario for future on-property exposures	future on-property farmer (adult and child), livestock grazing on-property, groundwater obtained on-property

See footnotes at end of table

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TABLE B.2-1
(Continued)

Land Use[1]	RAWPA Receptor (June 1992)[1]		Potentially Contaminated Media Contacted	Quantified In Current OU2 Risk Assessment?/Reason	Operable Unit 2 Receptor
Future (assumes reasonable future land uses of the property; no access controls) (Continued)	Construction intruder		surface/subsurface soil air	yes/evaluates potential risk of exposures to subsurface soil	future home-builder
	Recreational user[2]		surface soil air surface water sediment	yes/represents RME scenario for future on-property exposures (Fernald Risk Assessment Policy 93-1, October 19, 1993)	replaced with expanded trespasser
	Expanded Trespasser[2]		surface soil air surface water sediment	yes/EPA comment request (OU4 FS)	expanded trespasser
	User of perched groundwater[2]		perched groundwater surface soil air homegrown produce (irrigated from GMA) beef/milk from livestock grazing on-property (irrigated from GMA)	yes/EPA comment request	future user of perched groundwater
	Off-property farmer[2]		surface soil air homegrown produce beef/milk from livestock grazing off-property groundwater (Great Miami Aquifer)	yes/represents RME scenario for future off-property exposures	future off-property farmer (adult and child), livestock grazing off-property, groundwater off-property
	Great Miami River User	Recreational User	surface water fish	yes/evaluates potential risk to recreational GMR user	estimated surface water concentrations in GMR
		Agricultural User		yes/evaluates potential risk to agricultural users of GMR	estimated surface water concentrations in GMR
		Residential User		yes/evaluates potential risk to household users of the GMR	estimated surface water concentrations in GMR

[1]Identified in RAWPA (DOE 1992a)
[2]Not identified in RAWPA (DOE 1992a)
[3]NE- Not evaluated

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TABLE B.2-2

GENERIC DESCRIPTION OF EXPOSURE SCENARIOS AND EXPOSURE POINT CONCENTRATIONS OPERABLE UNIT 2 BASELINE RISK ASSESSMENT

Current Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current with Access Controls (current use of FEMP continues, DOE ownership)	Trespassing Youth	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
		air	inhalation particulates, volatiles, and gases	maximum estimated on-subunit current concentration derived from air modeling
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	incidental ingestion dermal contact external radiation	sediment within subunit
	Off-Property Resident Farmer (adult and child), homegrown produce off-property, livestock grazing off-property	air	inhalation particulates, volatiles, and gases	maximum estimated off-property current concentrations derived from air modeling
		plants (homegrown produce)	ingestion fruits and vegetables	maximum estimated off-property current concentrations derived from air modeling
		livestock (grazing off-property)	ingestion milk beef	maximum estimated off-property current concentrations derived from air modeling
	Groundskeeper	air	inhalation particulates, volatiles and gases	maximum estimated on-subunit current concentration derived from air modeling
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit

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TABLE B.2-2
(Continued)

Current Land Use	Receptor		Direct Contact Medium	Route of Exposure		Exposure Point Concentration
Current with Access Controls (current use of FEMP continues, DOE ownership) (Continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact		estimated concentrations in the Great Miami River
			fish	ingestion		estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion	fruit and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion	beef and milk	estimated concentrations in the Great Miami River
		Household User	surface water	inhalation ingestion dermal contact	particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Current without Access Controls (current use of FEMP continues)	User of Meat and Milk Products		livestock (grazing on-property)	ingestion of milk and beef		maximum estimated on-property current concentrations derived from air modeling

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TABLE B.2-2
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, grazing off-property, groundwater off-property	air	inhalation — particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from air modeling
		plants (homegrown produce)	ingestion — fruits and vegetables	maximum estimated off-property future concentrations derived from air modeling and groundwater modeling
		livestock (grazing at property boundary)	ingestion — milk and beef	maximum estimated off-property future concentrations derived from air modeling and groundwater modeling
		groundwater	ingestion dermal contact inhalation of volatiles released during household use	modeled groundwater concentrations at fenceline when concentration is greatest
	Expanded Trespasser (youth)	air	inhalation — particulates, volatiles, and gases	maximum estimated on-subunit air concentrations derived from air modeling
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	ingestion dermal contact external radiation	sediment within subunit

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TABLE B.2-2
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure		Exposure Point Concentration
Federal Ownership (Continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact		estimated concentrations in the Great Miami River
			fish	ingestion		estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion	fruit and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion	beef and milk	estimated concentrations in the Great Miami River
		Household User	surface water	inhalation ingestion dermal contact	particulates, volatiles and gases	estimated concentrations in the Great Miami River
Without Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, grazing off-property, groundwater off-property		air	inhalation	particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from air modeling
			plants (homegrown produce)	ingestion	fruits and vegetables	maximum estimated off-property future concentrations derived from air modeling and groundwater modeling
			livestock (grazing at property boundary)	ingestion	milk and beef	maximum estimated off-property future concentrations derived from air modeling and groundwater modeling
			groundwater	ingestion dermal contact inhalation of volatiles released during household use		modeled groundwater concentrations at fenceline when concentration is greatest

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TABLE B.2-2
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure		Exposure Point Concentration
Without Federal Ownership (Continued)	Future On-Property Resident Farmer (adult and child), homegrown produce on-subunit, livestock grazing on-property, groundwater on-property; will include RME and CT estimates	air	inhalation	particulates, volatiles, gases, and indoor radon	maximum estimated on-subunit future concentrations derived from air modeling; radon estimated from soil radium concentrations
		plants (homegrown produce)	ingestion	fruits and vegetables	maximum estimated on-subunit future concentrations derived from air modeling and groundwater modeling of the Great Miami Aquifer.
		livestock (grazing on property)	ingestion	milk and beef	maximum estimated on-subunit future concentrations derived from air modeling and groundwater modeling of Great Miami Aquifer
		groundwater	inhalation ingestion dermal contact	particulates, volatiles, and gases	groundwater concentration in Great Miami Aquifer underlying subunit at time when concentration is greatest
	Future On-Property Resident Farmer (adult and child), homegrown produce on-property, livestock grazing on-subunit, groundwater on property; will include RME and CT estimates (continued)	surface soil	incidental ingestion dermal contact external radiation		surface soil within subunit
	Future Homebuilder	waste material/subsurface soil	external radiation incidental ingestion dermal contact		subsurface soil within subunit
		air	inhalation	particulates, volatiles, and gases	air concentrations at construction site based on modeling

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TABLE B.2-2
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure		Exposure Point Concentration
Without Federal Ownership (Continued)	Future Perched Groundwater User, homegrown produce on-subunit, groundwater on-property	air	inhalation	particulates, volatiles, gases, and indoor radon	maximum estimated on-subunit future concentrations derived from air modeling; radon estimated from soil radium concentrations
		plants (home grown produce)	ingestion	fruits and vegetables	maximum estimated on-subunit future concentrations derived from air modeling and groundwater modeling of the Great Miami Aquifer
		livestock (grazing on property)	ingestion	milk and beef	maximum estimated on-subunit future concentrations derived from air modeling and groundwater modeling of the Great Miami Aquifer
		perched groundwater directly underlying subunit	ingestion dermal contact inhalation of volatiles released during house use		perched groundwater concentrations directly underlying the subunit at time when concentrations are greatest
		surface soil	incidental ingestion dermal contact external radiation		surface soil within subunit

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property; on-property groundskeeper conducting general maintenance activities not covered under FEMP health/safety and radiation programs, and Great Miami River (GMR) users under exclusive recreational, agricultural, and residential (household) uses. Users of meat and milk products from livestock grazing on the property were evaluated under the scenario that access controls are lost. As summarized in the CSM (Figure B.2-2) and on Table B.2-2, current land use receptors include:

- Off-Property Resident Farmer (Adult and Child) - This exposure scenario assumes that a farm family lives immediately adjacent to the FEMP property boundary. Exposure routes include:
  - Inhalation of fugitive dust, VOCs, and gases.
  - Consumption of farm-product foodstuffs including vegetables, meat, and milk.
- Trespassing Youth (7-18 years) - This exposure scenario considers the risk incurred by a trespassing youth who wanders freely over the site. Exposure routes include:
  - Inhalation of fugitive dust, VOCs, and gases.
  - Incidental ingestion of, direct radiation exposure from, and dermal contact with contaminated soils.
  - Incidental ingestion of and dermal contact with surface water.
  - Incidental ingestion of and dermal contact with contaminated sediment.
- On-Property Groundskeeper - This exposure scenario considers the risks associated with the on-site maintenance receptor. Exposure pathways include:
  - Inhalation of fugitive dust, VOCs, and gases
  - Incidental ingestion of dermal contact with, and direct radiation exposure from contaminated soil.

Current land use without access controls include the following receptors:

- Off-Property Resident Farmer (Adult and Child) - This exposure scenario assumes that a farm family lives immediately adjacent to the FEMP property boundary. Exposure routes include:
  - Inhalation of fugitive dust, VOCs, and gases.
  - Consumption of farm-product foodstuffs including vegetables, meat, and milk.
- Trespassing Youth (7-18 years) - This exposure scenario considers the risk incurred by a trespassing youth who wanders freely over the site. Exposure routes include:
  - Inhalation of fugitive dust, VOCs, and gases.
  - Incidental ingestion of, direct radiation exposure from, and dermal contact with contaminated soils.
  - Incidental ingestion of and dermal contact with surface water.
  - Incidental ingestion of and dermal contact with contaminated sediment.

- User of Meat and Milk Product from Livestock grazing on the site. This exposure scenario considers the risks associated with off-property use of animal products produced by cattle currently grazing on Operable Unit 2. Exposure pathways include:

  - Ingestion of beef and milk.

Under the current scenario, the use of the GMR was evaluated for three exclusive uses. This exposure scenario evaluates risks associated with the GMR for recreational, agricultural, and residential uses. It is assumed that the preceding use receptors are exclusive. Exposure routes for each receptor include:

- Recreational Use

  - Ingestion of and dermal contact with surface water.
  - Ingestion of fish.

- Agricultural Use

  - Consumption of beef and milk produced using contaminated water.
  - Consumption of fruits and vegetables produced using contaminated water.

- Residential Use

  - Ingestion of drinking water.
  - Inhalation of VOCs during household use.
  - Dermal contact while bathing.

The current land use configuration used in this risk assessment reflects the physical state of Operable Unit 2 as it exists today. Exposures assuming current land use are based on the following assumptions:

- The Active Flyash Pile and Lime Sludge Ponds remain on site, untreated, uncovered, and vegetated as they are currently.
- Existing DOE access restrictions remain.
- No additional removal actions are taken.
- Mobility of groundwater throughout the site is unaltered.
- Pathways of surface water runoff are unaltered.
- Vegetative cover remains unchanged.
- The effects of radiological and chemical decay of the source are assumed to be minimal.

As indicated in Table B.2-1, receptors listed in the Risk Assessment Work Plan Addendum (DOE 1992a) that were not evaluated under current land use for this risk assessment include:

- Visitor - This scenario is intended to evaluate exposures incurred by the activities of a regular visitor to the FEMP site who is not covered by a health and safety or radiation protection program. An example of this receptor would be a delivery person making regular deliveries to a given building on the site. This receptor was not considered applicable since no visitor would consistently visit the Operable Unit 2 area.

- On-Property Building User - This scenario considers risks from occupancy of an existing building on site by a hypothetical receptor. This receptor was not considered since no existing habitable structures exist in Operable Unit 2.

- Hunter - this scenario examines risks due to consumption of animal products from wild animals found on the FEMP property. This receptor, as stated in the Risk Assessment Work Plan, will be evaluated in the Operable Unit 5 RI report.

B.2.2.2.2 Future Exposure Scenarios

Under future land use assumptions it is assumed that the FEMP site will either be retained by the federal government (federal ownership) or will be released for private development (private ownership). It is assumed that the FEMP site may remain restricted under federal ownership. Hence the most appropriate future on-property receptor to evaluate is the expanded trespasser. Potential exposures to an off-property farmer family and users of the GMR were also evaluated. It was assumed that the most likely off-site future land use would be for it to remain agricultural. For the GMR users, it was assumed that Operable Unit 2 has potential to contaminate the GMR and Paddys Run. Specific exposure pathways which these receptors may be exposed to constituents on, or migrating from Operable Unit 2 source areas, are summarized in the CSM and listed in Table B.2-2.

For the purpose of establishing preliminary remediation goals (PRGs) for the Future Land Use With Continued Federal Ownership scenario, an on-property trespassing receptor was established. Under this exposure scenario, access to the site would be restricted and discouraged through the construction and maintenance of signs, fences, and locked gates around the perimeter of the restricted area. Despite these controls, it was assumed that trespassing would occur. The expanded trespasser scenario assumes a youth (ages 6 to 18) trespasses 110 days per year for two hours each day and the same person trespasses as an adult (ages 18 to 50) 40 days per year for one hour each day. This receptor and the associated exposure factors apply only to Operable Units 1, 2, 3, and 4. The risk assessment for the Operable Unit 5 FS will include additional trespassing and recreational exposure scenarios, which are to be fully developed on a site-wide basis within the Operable Unit 5 RI/FS. A

full array of trespassing and recreational exposure scenarios from no trespassing through full recreational use of the site will be developed.

Potential exposures to an off-property farm family and recreational user of the Great Miami River were also evaluated. It was assumed that the most likely off-site future land use would be for it to remain agricultural. For the Great Miami River user, it was assumed that Operable Unit 2 has potential to contaminate the Great Miami River and Paddys Run. This receptor is evaluated for both federal ownership and private ownership. Specific exposure pathways which these receptors may be exposed to constituents on, or migrating from Operable Unit 2 source areas are summarized in the CSM and listed in Table B.2-2.

As summarized in the CSM (Figure B.2-2), future land use receptors assuming federal ownership, include:

- The Expanded Trespasser - This scenario assumes that access to the area remains restricted in the future and that either an adult or child trespasser routinely visit the area and be exposed to CPCs. Exposure routes include:

  - Inhalation of fugitive dust, VOCs, and gases.
  - Ingestion of, dermal contact with, and external radiation from, contaminated soil.
  - Incidental ingestion of and dermal contact with surface water.
  - Incidental ingestion and dermal contact with sediment.
  - External radiation from contact with sediment.

- The Off-Property Resident Farmer (Adult and Child) - This scenario assumes that a farm family lives immediately adjacent to the FEMP property boundary. Exposure routes for this receptor include those listed for the same receptor assuming current land use, in addition to ingestion, dermal contact, and inhalation from groundwater.

- User of the Great Miami River (Adult and Child) - This scenario considers risks to an off-property resident who uses the river for recreation purposes. Exposure routes include:

  - Incidental ingestion of and dermal contact with surface water.
  - Incidental ingestion of and dermal contact with sediment.
  - Ingestion of fish.

If the FEMP property does not remain under the federal ownership, it is assumed that it will be held in private ownership and developed for agricultural use. As illustrated in the CSM (Figure B.2-2) and summarized in Table B.2-2, future land use receptors, assuming private ownership, include:

- The RME On-Property Resident Farmer Receptor (Adult and Child) - This exposure assumes that a farmer resides on the property and conducts agricultural activities. Typical activities may include food and feed production, livestock production, and general farm work. Exposure routes include:

  - Inhalation of fugitive dust, VOCs, and gases.
  - Ingestion of groundwater (separate evaluations for groundwater from the Great Miami Aquifer and for perched groundwater).
  - Dermal contact and inhalation while using groundwater in the home.
  - Consumption of foodstuff grown on the property, including vegetables, meat, and milk.
  - Incidental ingestion of, external radiation from, and dermal contact with, soil.
  - Inhalation of indoor radon.

- The CT On-Property Resident Farmer Receptor (Adult) - This exposure assumes that a farmer resides on the property and conducts agricultural activities. This exposure is similar to the RME on-property resident farmer with modifications of exposure parameter values to more closely reflect values typical of the CT of exposure. Exposure routes for this receptor include those listed for the RME on-property resident farmer receptor, excluding ingestion of perched groundwater trapped within the sand lens.

- The Future Home Builder - This exposure scenario involves exposures to workers building residences or other structures within Operable Unit 2. Exposure routes include:

  - Dermal contact with, ingestion of and external radiation from soil.
  - Inhalation of fugitive dust, VOCs, and gases.

- A Perched Groundwater User - This exposure scenario involves exposures to users of perched groundwater within Operable Unit 2. This scenario includes only household use of perched groundwater, because the perched groundwater zone would not be sufficient to support agricultural use. Exposure routes include:

  - Inhalation and dermal contact while using perched groundwater.
  - Ingestion of perched groundwater.

Under the future scenario, the use of the GMR was evaluated for three exclusive uses. This exposure scenario evaluates risks associated with the GMR for recreational, agricultural, and residential uses. It is assumed that the preceding use receptors are exclusive. Exposure routes for each receptor include:

- Recreational Use

  - Ingestion of and dermal contact with surface water.
  - Ingestion of fish.

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- Agricultural Use

  - Consumption of beef and milk produced using contaminated water.
  - Consumption of fruits and vegetables produced using contaminated water.

- Residential Use

  - Ingestion of drinking water.
  - Inhalation of VOCs during household use.
  - Dermal contact while bathing.

- User of the Great Miami River (Adult and Child) - This scenario considers risks to an off-property resident who uses the river for recreation purposes. Exposure routes include:

  - Incidental ingestion of and dermal contact with surface water.
  - Incidental ingestion of and dermal contact with sediment.
  - Ingestion of fish.

The future land use assumptions reflect activities that require development time. It is assumed that under continued federal ownership, areas within Operable Unit 2 will remain restricted and that under private ownership, the operable unit is developed for residential and agricultural purposes. This land use configuration considers both the site's current configuration and the processes that would act on it if all maintenance activities were discontinued. Exposures assuming future land use are based on the following assumptions:

- The South Field and Solid Waste Landfill may be developed as cropland or pastureland.

- The OU2 assessment considers three future receptors, the expanded trespasser, off-property resident farmer (private ownership), and on-property RME farmer. These three receptors were selected based upon the conservative exposure parameters and exposure activities. The selected receptors are found in each of the five subunits and provide a good comparative range of risks and activities. Although child receptors are recognized to be good indicators of toxicity their limited exposure duration limits the estimation of carcinogenic effects.

- Domestic water source for on-property residences will be obtained from locations on the site producing the maximum potential exposures to constituents.

- Off-property receptors will remain the same as under the current land use configuration.

- Excess surface water runoff flows to Paddys Run and eventually into the Great Miami River.

- Vegetative cover is consistent with local agricultural practices and ecological succession.

- Under federal ownership, an expanded trespasser moves freely throughout the area.

- The OU2 wide assessment considers three future receptors, the expanded trespasser, off-property resident farmer (private ownership), and on-property RME farmer. The exposure assessment methodologies for these receptors under the OU2 wide scenario are identical to the other land use scenarios.

B.2.3 EVALUATION OF DATA AND IDENTIFICATION OF CONSTITUENTS OF POTENTIAL CONCERN

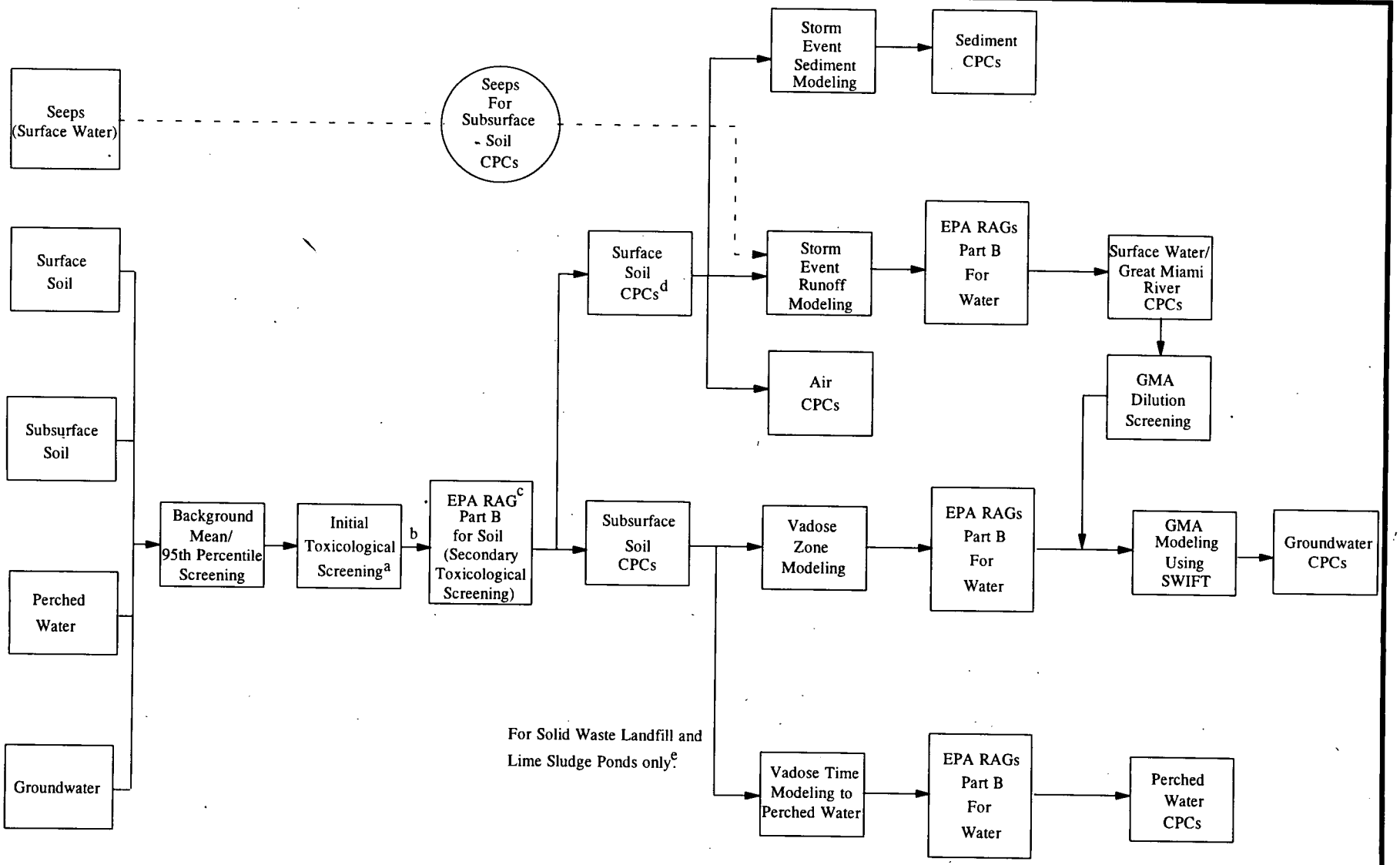
As indicated above, remedial decisions are made for each waste area, or subunit, within Operable Unit 2. Consequently, CPCs are identified separately for all relevant environmental media for each subunit for use in quantifying risk for that subunit. To ensure a consistent approach for operable unit risk assessments, the FEMP has established guidelines for determining CPCs. The selection process follows guidance provided by EPA Region V and is generally illustrated in Figure B.2-3A (Figure B.2-3B and B.2-3C are in Section B.2.4A.2.3 on pages B-2-92 and B-2-93).

The selection process involves first a statistical comparison of constituent concentrations with background concentrations and then a conservative toxicological screening to identify CPCs. Sources of analytical data subjected to this process are described in Section B.2.3.1. Procedures used to analyze and validate the data are described in Section B.2.3.2. The statistical process used to compare constituent concentrations to background is described in Section B.2.3.4. Procedures used to calculate concentration terms for use in that comparison are described in Section B.2.3.5. This process is then followed by a toxicological screening process, which is described in Section B.2.3.6. Constituents not eliminated by the end of this process are carried completely through the risk assessment process. Those CPCs remaining at the end of the risk assessment process become COCs.

Since radionuclides and chemical carcinogens were expected to contribute the most to estimated risk at Operable Unit 2, radionuclides and EPA Class A, B1, or B2 carcinogens were an exception to the process. These compounds were selected as CPCs for all media where they were detected regardless of whether they were present below background or below screening criteria.

The statistical methods used in data evaluation are shown as a process flowchart in Figure B.2-4. The rationale used to develop this methodology and the statistical techniques are based on the following sources:

- "The Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Volume I, Part A, Interim Final" (EPA 1989a).



[a]Initial toxilogical screening includes removal of CPCs based on detection only once in one medium; essential macro/micronutrients; ubiquitious in nature; and nonspecific class of compounds (see Section B.2.4.2).

[b]Surface and subsurface soil possible CPCs.

[c]Risk Assessment Guidance, Part B (EPA 1991d).

[d]Constituents of Potential Concern

[e]Subunits where perched water may be used for drinking water.

FIGURE B.2-3A CONSTITUENTS OF POTENTIAL CONCERN (CPCs) IDENTIFICATION PROCESS

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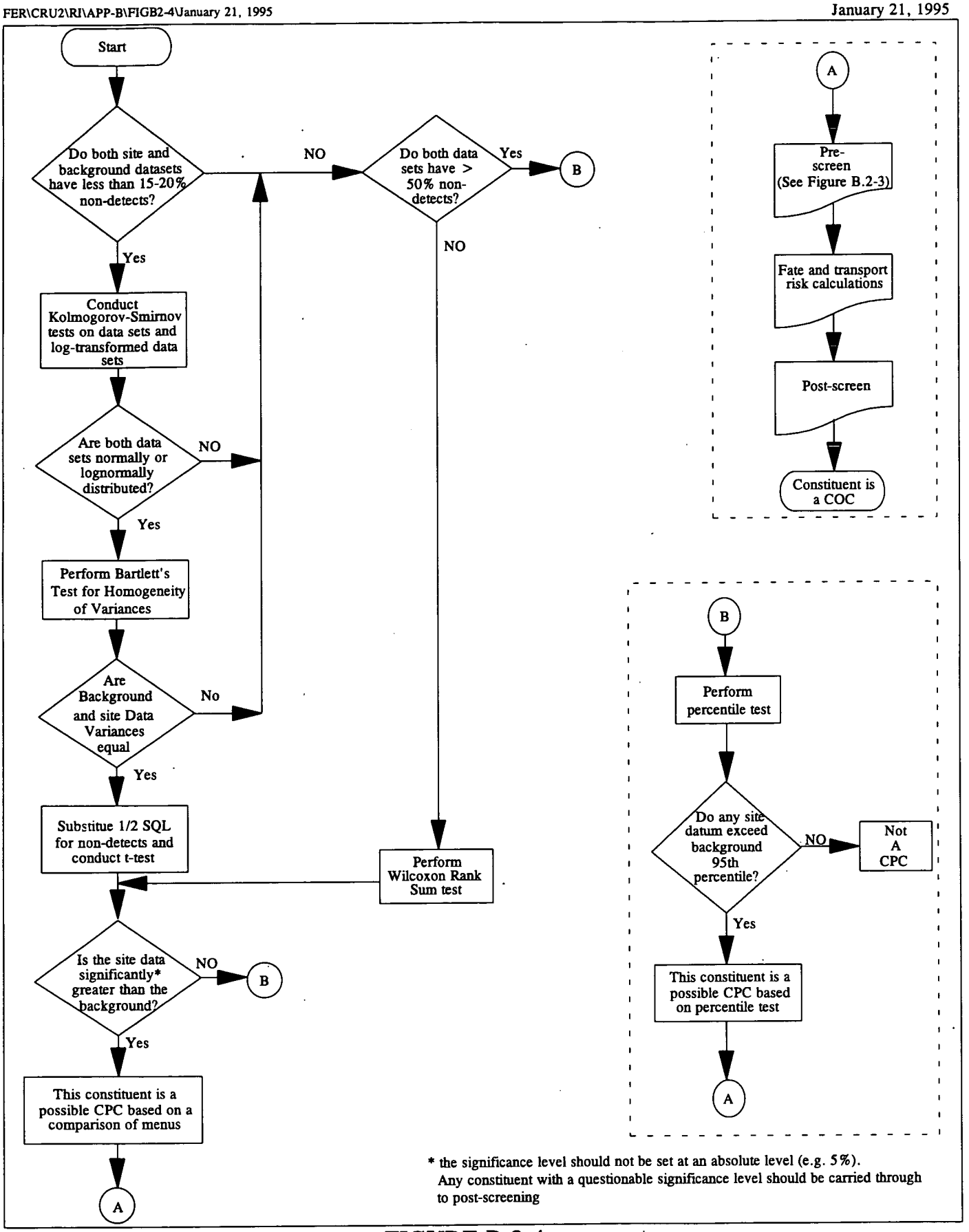

* the significance level should not be set at an absolute level (e.g. 5%). Any constituent with a questionable significance level should be carried through to post-screening

FIGURE B.2-4
CONSTITUENT OF POTENTIAL CONCERN (CPC) SELECTION PROCESS

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- "Statistical Methods for Evaluating the Attainment of Cleanup Standards, Volume I and Volume 3 (Draft)" (EPA 1989d and 1990a).
- "Statistical Methods for Environmental Pollution Monitoring" (Gilbert 1987).
- "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance" (EPA 1989e).
- "EPA comments (December 1991 and March 1992) on the statistical methods used in the October 1991 Draft Risk Assessment Work Plan Addendum (Saric 1991 and 1992).

B.2.3.1 Data Sources

Below is a discussion of data sources used in this baseline risk assessment. These data sources included subunit data generated during on-site field sampling programs and background data generated from samples collected 3 to 5 miles away from the FEMP site.

B.2.3.1.1 Subunit Data

In accordance with the Risk Assessment Work Plan Addendum, data generated in RI/FS field sampling programs are given first consideration in risk assessments. These data are the most current and most reliable based on RI/FS quality assurance/quality control (QA/QC) practices. For Operable Unit 2, two RI/FS field sampling programs were completed. The first (Phase I) was completed in the Summer 1992 and the second (Phase II) was completed in Summer 1993. Analytical data from both of these efforts are utilized in this risk assessment. Because data from the Characterization Investigation Study (CIS) were not validated, data from these investigations were not used for this risk assessment, but were used to guide sampling activities for the Phase I and Phase II RI/FS (see Section 2.0 of this report.)

B.2.3.1.2 Background Data

The site-specific background data set for soil consisted of a series of soil samples collected approximately three to five miles from the FEMP site. Background concentrations in surface and subsurface soil were determined based on direct analysis of regional soils at three depths (i.e., 0 to 6 inches, 36 to 42 inches, and 48 to 54 inches), the assumption of secular equilibrium in the radioactive decay process, and the recognition that certain organic compounds and radionuclides (i.e., technetium-99 and the isotopes of plutonium) do not occur naturally.

Background concentrations for the glacial overburden unit and the Great Miami Aquifer are based on the sample results provided in the FEMP RI/FS document "Characterization of Background Water Quality for Streams and Groundwater". Background concentrations in the Great Miami Aquifer are from upgradient Wells 2043, 2050, 2056, 2066, and 2383 located off-site from Operable Unit 2.

Background concentration in the glacial overburden unit are from Wells 1024, 1040, 1059, 1060, and 1065. These locations are distant from site activities and known sources of contamination. Lithologic correlation is highly variable because of the heterogeneity and anisotropy of glacial sediment. Much of the glacial overburden at the FEMP consists of a clayey till and discontinuous sand lenses. Unsaturated zones within the glacial overburden make a transition to perched lenses when sandy units are encountered, because of porosity changes and semiconfined hydrostatic pressures. Therefore, the geochemistry of perched zone groundwater samples may vary from site to site. Background concentrations in the overburden unit are listed in Section B.4.0.

B.2.3.2. Data Validation

The data validation process is described in Section 2.2.2.4 of this RI report. All of the measured constituent concentration data obtained in the RI/FS sampling program for Operable Unit 2 have been validated. Data which did not adequately meet the criteria addressed during data validation were rejected. These data were not used in the quantitative baseline risk assessment process according to EPA guidance (EPA 1989a). All measured constituent concentration data used in this risk assessment was validated to at least ASL C, and 10 percent were validated to ASL D.

B.2.3.3 Treatment of Non-Detected Results

Analytical results are presented as "non-detects" whenever chemical concentrations in samples do not exceed the detection or quantitation levels for the analytical procedures for those samples. There are numerous terms used to describe the detection or quantitation levels (EPA 1989a). SQLs are the most relevant quantitation limits for evaluating non-detected chemicals. SQLs take into account sample characteristics, sample preparation, and analytical adjustments. Generally, the detection limit (the lowest amount of a chemical that can be "detected" above the normal, random noise of an analytical instrument or method) is multiplied by a factor of three to five to obtain the SQL (EPA 1989a).

For radionuclides, the minimum detectable activity (MDA) corresponds most directly to the SQL for chemicals. The MDA is the estimate of the activity level that can be practically achieved under a

specified set of typical measurement parameters. These parameters include the sample size, counting time, counting efficiency, self-absorption and decay corrections, chemical yield, and other factors involved in determining activity concentrations (EPA 1980). For the purposes of evaluating data in the RI/FS, the term "SQL" will be used for both chemicals and radionuclides.

Non-detected results (if present in the data set) must be considered with positively detected background results for determining the descriptive statistics for background data sets. Although EPA's Risk Assessment Guidance for Superfund Part A, Human Health Evaluation Manual allows for best professional judgement in determining the most appropriate assignment of values for non-detected results (EPA 1989a), EPA Region V has requested that a value of one-half the SQL be assigned for each non-detected result. Therefore, statistical treatment of background data for risk assessments will conform with the methodology requested by EPA Region V.

A value of the SQL was sought for each non-detected result. If SQLs were not obtainable for chemical analytical results, the contract-required quantitation limit (CRQL) was used as the value of the SQL. The uncertainty introduced by this assumption was evaluated, since the CRQL may have overestimated or underestimated the actual SQL (EPA 1989a).

B.2.3.4 Evaluation of Background

B.2.3.4.1 Determination of Background Distribution

Each background data set was evaluated to determine the probability distribution (normal, lognormal, or undefined) that best describes the data set. Two methods were used to determine the distribution type.

The first method employed to determine the appropriate distribution was the Kolmogorov-Smirnov test with Lilliefors adjustment (Lilliefors 1967). This method is recommended in EPA's Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities. The test was performed on the untransformed data to test the normality assumption and on the log-transformed data to test the assumption of lognormality. If the test provided sufficient evidence to reject both normality or lognormality assumptions then a second method was employed.

The second method consists of the construction of a probability plot of the data set. If the plotted points fit a straight line reasonably well with no large data gaps, a normal distribution will be assumed. If the data do not follow a straight line on the probability plot, the data was log-transformed and a new plot is generated. If the log-transformed data reasonably fit a straight line then a lognormal distribution was assumed. If a straight line does not fit the plotted points on either the normal probability plot or the log-transformed probability plot, then it was assumed that the data set is neither normally distributed nor lognormally distributed. Visual inspection of the probability plot is often sufficient to determine whether the plotted points follow a normal or lognormal distribution though some experienced professional judgement may be necessary when there are minor deviations. The statistical methods employed to determine the concentration terms are robust to minor deviations from normality or lognormality and visual inspection of probability plots is often a sufficient tool.

B.2.3.4.2 Tests for Outliers in Background Concentration Data

An outlier is defined as an abnormally high or low data value. Since an outlier can represent a true extreme value or can indicate data errors, it is important to evaluate each data value to determine if it is an outlier or a true data value that will be included in the data set (Gilbert 1987).

Visual inspection of the normal and lognormal probability plots of the data set (see Section B.2.3.3.1) was performed to determine whether any data points differ significantly from the remaining data. A value that was four to five times greater than the next highest data value is generally viewed with suspicion.

In order to yield meaningful results, the t-Test is used only if the following conditions are met:

1) Do both the site dataset and background dataset contain fewer than 15 to 20% non-detects.
2) Do the site and background datasets come from the same type of distribution (i.e. are they both Normal? Both LogNormal?)
3) Do the datasets pass Bartlett's test for homogeneity of variances. This is important to ensure that potentially significant results are not being masked by one dataset be highly variable.

If the above criteria are not met then the non-parametric Wilcoxon Rank Sum procedure was applied because it is a distribution-free technique and does not rely on distributional assumptions. Both of these procedures can be found in any general statistical text (e.g. Gilbert, 1987).

If specific data points stood out as suspected outliers in the background datasets, a quantitative test was performed. Since this test, as with most quantitative tests for outliers, assumes an approximate normal distribution, attempts were made to transform datasets that are not normally distributed to approximate a normal distribution before the test is performed.

The method used for identifying outliers consisted of the following steps:

1. Calculate the mean, $\bar{x}$, and the standard deviation, s, of the data including all measurements.

2. Compute the statistic, T_n, given by

$$T_n = \frac{x_n - \bar{x}}{s} \qquad \text{(B.2-1)}$$

   for each value suspected of being on outlier.

3. Compare the statistic T_n to the critical value for the given sample size, n, from Table 4-2 in the Risk Assessment Work Plan Addendum (DOE 1992a).

4. If the statistic T_n for the suspected value exceeds the critical value from Table 4-2 in the Risk Assessment Work Plan Addendum (DOE 1992a), this is evidence that the suspected value, x_n, is a statistical outlier.

Since the presence of outliers can severely affect the determination of descriptive statistics and statistical comparisons, any potential or suspect outliers in the background data sets were investigated. The investigation included, if possible, a review of the raw data associated with the determination of the background concentration value.

During the determination of background concentration values, nine values failed the outliers test and were removed from the groundwater data before determination of the concentration terms because they were highly suspect and assumed to be true outliers. The values were:

Calcium:	1.03 J and 1.3 J,	UCL = 100.7
Chromium:	0.56 J,	UCL = 0.01

Magnesium:	0.5 J and 0.581,	UCL = 28.3
Nickel:	0.78 J,	UCL = 0.012
Potassium:	13.4 and 13.5,	UCL = 2.004
Selenium:	0.06 UJ,	UCL = 0.002

("J" indicates an estimated value below the method detection limit, "UJ" indicates that the value was below an estimated detection limit of the value shown.)

Tables B.2-2A through B.2-2D provide the background and 95th percentile concentration values.

B.2.3.5 Determination of Concentration Term

The subunit concentration term is assumed to be the 95 percent UCL of the mean. If the distribution for an analyte was determined to be either normal or lognormal the appropriate equation was used to calculate the 95 percent UCL. Section B.2.3.4.1 presents the methods used to determine which distribution best fits the data and therefore which equation should be used to estimate the concentration term. The UCL equations for both a normal distribution and lognormal distribution are presented below.

The UCL for a normal distribution (Gilbert 1987):

$$UCL_{(.95)} = \bar{x} + t_{(.95,n-1)} \times \frac{S}{\sqrt{n-1}} \qquad \text{(B.2-5)}$$

where

n = number of samples
$\bar{x}$ = sample mean concentration
$t_{(.95,n-1)}$ = percentage point from the t distribution
s = sample standard deviation
$= \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i-\bar{x})^2}$

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TABLE B.2-2A

BACKGROUND CONCENTRATIONS FOR SURFACE SOIL

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Aluminum	mg/kg	30/30	5350	15000	8,812.15	11,880.19
Antimony	mg/kg	0/30				
Arsenic	mg/kg	26/30	3.4	9.2	5.56	8.20
Barium	mg/kg	29/29	31	94.1	67.70	94.10
Beryllium	mg/kg	1/30	0.6	0.6	0.60	0.60
Boron	mg/kg	11/29	12.6	25.4	12.60	25.10
Cadmium	mg/kg	6/30	0.52	0.95	0.52	0.87
Calcium	mg/kg	30/30	856	5340	2,581.16	4,339.17
Chromium	mg/kg	30/30	6.7	17.7	11.62	15.50
Cobalt	mg/kg	30/30	4.3	16.5	10.78	14.16
Copper	mg/kg	27/30	3.2	17.3	8.60	14.07
Cyanide	mg/kg	12/30	0.14	0.29	0.15	0.27
Iron	mg/kg	30/30	9370	24900	16,244.47	21,728.17
Lead	mg/kg	28/30	11	36.4	18.90	26.40
Magnesium	mg/kg	30/30	1020	3590	1,926.10	2,776.97
Manganese	mg/kg	29/29	189	1500	814.16	1,348.04
Mercury	mg/kg	2/30	0.12	0.3	0.12	0.12
Molybdenum	mg/kg	0/30				
Nickel	mg/kg	29/30	5.8	22.7	12.72	20.87
Potassium	mg/kg	29/30	374	1590	834.25	1,231.34

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TABLE B.2-2A
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Selenium	mg/kg	1/30	0.72	0.72	0.72	0.72
Silicon	mg/kg	29/29	480	2230	1,276.44	1,797.03
Silver	mg/kg	0/30				
Sodium	mg/kg	27/30	26.9	54.7	37.50	51.10
Thallium	mg/kg	1/30	0.58	0.58	0.58	0.58
Vanadium	mg/kg	30/30	11.3	32.7	22.28	30.37
Zinc	mg/kg	30/30	29.4	70	44.60	59.61
Actinium-227	pCi/g	1/30	0.09	0.09	0.09	0.09
Cesium-137	pCi/g	30/30	0.15	0.71	0.44	0.71
Lead-210	pCi/g	30/30	0.53	1.3	1.00	1.30
Potassium-40	pCi/g	30/30	13.1	21.4	16.89	19.71
Protactinium-231	pCi/g	0/30				
Radium-224	pCi/g	30/30	0.54	0.93	0.86	0.90
Radium-226	pCi/g	30/30	0.85	1.48	1.22	1.42
Radium-228	pCi/g	30/30	0.8	1.27	1.10	1.25
Ruthenium-106	pCi/g	0/30				
Strontium-90	pCi/g	0/30				
Technetium-99	pCi/g	0/30				
TH-Total	ug/g	2/30	8.31	10.7	10.70	10.70
Thorium-288	pCi/g	29/30	0.68	1.43	1.12	1.43

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TABLE B.2-2A
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Thorium-230	pCi/g	29/30	0.9	2.01	1.50	1.97
Thorium-232	pCi/g	30/30	0.64	1.52	1.08	1.36
Uranium-234	pCi/g	30/30	0.67	1.31	1.04	1.24
Uranium-235/236	pCi/g	27/30	0.03	0.2	0.09	0.15
Uranium-238	pCi/g	30/30	0.85	1.33	1.08	1.22

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TABLE B.2-2B

BACKGROUND CONCENTRATIONS FOR SUBSURFACE SOIL

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Aluminum	mg/kg	51/51	3250	16100	9737.08	16063.97
Antimony	mg/kg	0/37				
Arsenic	mg/kg	44/51	1.6	14.5	5.65	9.57
Barium	mg/kg	51/51	13.7	134	67.17	119.17
Beryllium	mg/kg	15/50	0.48	0.68	0.48	0.62
Boron	mg/kg	49/51	18.6	47.1	31.27	42.95
Cadmium	mg/kg	6/51	0.47	1.3	0.47	0.91
Calcium	mg/kg	51/51	3310	335000	108000.00	15000.00
Chromium	mg/kg	51/51	4.5	22.4	12.63	20.68
Cobalt	mg/kg	51/51	3.6	17.9	10.04	20.03
Copper	mg/kg	50/51	6.8	24.3	13.41	20.03
Cyanide	mg/kg	2/50	0.13	0.17	0.13	0.13
Iron	mg/kg	51/51	8970	30700	20138.49	30700.00
Lead	mg/kg	47/51	3	18.4	9.52	15.58
Magnesium	mg/kg	51/51	2930	54100	24206.82	42648.21
Manganese	mg/kg	51/51	251	1750	534.00	1300.00
Mercury	mg/kg	1/51	0.29	0.29	0.29	0.29
Molybdenum	mg/kg	1/51	2.7	2.7	2.70	2.70
Nickel	mg/kg	51/51	8.5	41.9	21.90	34.35
Potassium	mg/kg	51/51	340	2180	1178.62	1979.99

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TABLE B.2-2B
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Selenium	mg/kg	0/51				
Silicon	mg/kg	51/51	449	1850	1060.12	1593.08
Silver	mg/kg	0/51				
Sodium	mg/kg	51/51	53.8	345	131.00	285.00
Thallium	mg/kg	3/51	0.49	0.55	0.49	0.49
Vanadium	mg/kg	51/51	8.43	44.5	18.50	37.80
Zinc	mg/kg	51/51	27.3	101	52.29	72.58
Actinium-227	pCi/g	3/51	0.06	0.1	0.06	0.06
Cesium-137	pCi/g	0/51				
K-40	pCi/g	51/51	8.6	31	18.71	27.76
Protactinium-231	pCi/g	0/51				
Lead-210	pCi/g	43/51	0.31	0.97	0.57	0.81
Radium-224	pCi/g	51/51	0.29	1.07	0.66	1.01
Radium-226	pCi/g	51/51	0.59	1.61	0.88	1.47
Radium-228	pCi/g	51/51	0.36	1.37	0.85	1.31
Ruthenium-106	pCi/g	51/51				
Strontium-90	pCi/g	1/51	0.56	0.56	0.56	0.56
Technetium-99	pCi/g	0/51				
Thorium-288	pCi/g	41/51	0.6	1.39	0.88	1.33
Thorium-230	pCi/g	45/51	0.62	2.34	1.24	1.88

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TABLE B.2-2B
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Thorium-232	pCi/g	36/51	0.63	1.35	0.85	1.26
TH-Total	ug/g	3/3	8.24	9.47	9.47	9.47
Uranium-234	pCi/g	47/51	0.48	1.3	0.73	1.04
Uranium-235/236	pCi/g	46/51	0.03	0.2	0.06	0.15
Uranium-238	pCi/g	48/51	0.6	1.23	0.84	1.12

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TABLE B.2-2C

BACKGROUND CONCENTRATIONS FOR PERCHED WATER

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Aluminum	mg/L	2/2	0.1206	0.123	0.123	0.123
Antimony	mg/L	10/20	0.1	4.5	0.580	4.340
Arsenic	mg/L	3/12	0.015	0.122	0.015	0.122
Barium	mg/L	19/20	0.034	0.459	0.112	0.450
Beryllium	mg/L	2/2	0.001	0.0018	0.002	0.002
Cadmium	mg/L	2/19	0.006	0.007	0.006	0.007
Calcium	mg/L	22/22	74.4	130	99.878	123.837
Chloride	mg/L	17/22	1.4	50	25.000	46.100
Chromium	mg/L	8/22	0.02	0.12	0.020	0.035
Cobalt	mg/L	0/2				
Copper	mg/L	5/22	0.013	0.19	0.013	0.030
Fluoride	mg/L	22/22	0.2	1.3	0.786	1.298
Iron	mg/L	15/22	0.061	4.9	2.100	3.440
Lead	mg/L	5/13	0.002	0.05	0.003	0.050
Magnesium	mg/L	22/22	20.4	47.8	35.236	48.546
Manganese	mg/L	15/20	0.007	0.22	0.092	0.150
Mercury	mg/L	2/20	0.0004	0.0037	0.0004	0.0004
Molybdenum	mg/L	2/20	0.024	0.028	0.024	0.025
Nickel	mg/L	5/22	0.021	0.18	0.021	0.026
Nitrate	mg/L	11/13	0.012	0.3	0.315	0.462

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TABLE B.2-2C
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Phosphorus	mg/L	12/20	0.026	0.18	0.117	0.206
Potassium	mg/L	19/20	0.891	31.5	16.599	26.976
Selenium	mg/L	0/11				
Silver	mg/L	5/22	0.0105	0.052	0.011	0.040
Sodium	mg/L	20/20	5.71	56.3	30.081	47.982
Sulfate	mg/L	19/22	3.24	175	75.716	138.192
Total Kjelda	mg/L	6/9	0.178	4.34	4.200	4.340
Vanadium	mg/L	2/2	0.018	0.0195	0.020	0.020
Zinc	mg/L	1/2	0.0317	0.0317	0.032	0.032
NP-237	pCi/L	0/19				
PU-238	pCi/L	0/19				
PU-239/240	pCi/L	0/19				
Radium-226	pCi/L	1/16	1	1	1.000	1.000
Radium-228	pCi/L	2/18	4.5	5.2	4.500	5.200
Strontium-90	pCi/L	0/20				
Technetium-99	pCi/L	0/22				
Thorium-288	pCi/L	2/23	1.04	1.6	1.040	1.040
Thorium-230	pCi/L	1/23	2	2	2.000	2.000
Thorium-232	pCi/L	0/19				
TH-Total	ug/L	1/13	3	3	3.000	3.000

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TABLE B.2-2C
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Uranium-234	pCi/L	5/22	1.06	1.9	1.060	1.900
Uranium-235	PCi/L	0/2				
Uranium-235/236	pCi/L	21/21				
Uranium-238	pCi/L	2/22	1.07	1.5	1.070	1.070
U-Total	ug/L	9/21	0.8	5.33	1.000	4.000

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TABLE B.2-2D

BACKGROUND CONCENTRATIONS FOR GROUNDWATER (GMA)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Ammonia	mg/L	36/105	0.1	12.6	0.100	3.240
Chloride	mg/L	102/117	0.02	120	54.077	120.00
Fluoride	mg/L	111/118	0.05	1.9	0.410	0.929
Nitrate	mg/L	57/69	0.014	24.9	1.880	11.400
Phenols	mg/L	57/106	0.01	0.09		
Phosphorus	mg/L	75/106	0.01	3.08	0.261	0.679
Sulfate	mg/L	108/118	2.79	321	133.229	352.992
Sulfide	mg/L	3/14	0.0005	30.4	0.250	30.400
TDS	mg/L	2/2	472	600	600.00	600.00
TKN	mg/L	37/53	0.116	4.74	1.450	3.224
TOC	mg/L	13/21	1	4.12	2.250	3.764
TOH	mg/L	11/82	0.01	0.32	0.010	0.021
TON	mg/L	63/98	0.1	2.75	0.259	0.652
Aluminum	mg/L	17/21	0.062	0.182	0.118	0.180
Antimony	mg/L	1/5	0.0384	0.0384	0.006	0.006
Arsenic	mg/L	24/87	0.002	0.55	0.004	0.300
Barium	mg/L	100/114	0.006	0.789	0.166	0.436
Beryllium	mg/L	7/11	0.001	0.0023	0.0017	0.0023
Cadmium	mg/L	24/112	0.002	0.017	0.002	0.006
Calcium	mg/L	114/115	63.6	181	100.673	134.783

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TABLE B.2-2D
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
Chromium	mg/L	43/117	0.01	0.045	0.010	0.041
Cobalt	mg/L	0/11				
Copper	mg/L	37/118	0.01	0.27	0.010	0.120
Cyanide	mg/L	0/5				
Iron	mg/L	77/117	0.007	4.2	0.642	4.000
Lead	mg/L	17/81	0.0026	0.14	0.0026	0.028
Magnesium	mg/L	114/114	15.7	46.5	28.274	37.961
Manganese	mg/L	86/112	0.002	0.897	0.078	0.800
Mercury	mg/L	13/111	0.0002	0.0011	0.0002	0.0005
Molybdenum	mg/L	24/109	0.004	0.04	0.004	0.025
Nickel	mg/L	19/117	0.012	0.036	0.012	0.024
Potassium	mg/L	101/109	0.664	4.03	2.004	3.077
Selenium	mg/L	5/77	0.002	0.006	0.002	0.004
Silicon	mg/L	10/10	2	6.14	4.729	6.140
Silver	mg/L	18/116	0.01	0.11	0.010	0.014
Sodium	mg/L	117/112	0.61	55	20.741	51.267
Thallium	mg/L	0/05				
Tin	mg/L	0/3				
Vanadium	mg/L	18/21	0.01	0.025	0.018	0.025
Zinc	mg/L	11/11	0.0202	0.133	0.066	0.095

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TABLE B.2-2D
(Continued)

PARAMETER	UNITS	FREQUENCY	MINHIT	MAXHIT	CONC TERM	95TH PERCENTILE
CS-137	pCi/L	0/5				
NP-237	pCi/L	0/103				
PU-238	pCi/L	0/105				
PU-239/240	pCi/L	0/105				
Radium-226	pCi/L	1/95	1.1	8.5	1.100	1.200
Radium-228	pCi/L	8/91	3.1	5.5	3.100	4.000
Radium-106	pCi/L	0/6				
Strontium-90	pCi/L	0/107				
Technetium-99	pCi/L	1/114	36	36	< 30 ?	36.000
Thorium-288	pCi/L	8/119	1	2.9	1.000	1.400
Thorium-230	pCi/L	11/119	1	3.44	1.000	1.700
Thorium-232	pCi/L	0/108				
TH-Total	ug/L	4/85	2	6.14	2.000	2.000
Uranium-234	pCi/L	7/118	1.2	4.2	1.200	1.200
Uranium-235	PCi/L	0/3				
Uranium-235/236	pCi/L	0/115				
Uranium-238	pCi/L	4/118	0.9	4.4	0.900	0.900
U-Total	ug/L	51/113	0.1	3.13	0.300	2.000

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The UCL for a lognormal distribution:

$$UCL_{(.95)} = e^{\bar{y} + \frac{s_y^2}{2}} + \frac{S_y \times H_{.95}}{\sqrt{n-1}} \qquad \text{(B.2-6)}$$

where

n = number of samples
$\bar{y}$ = sample mean of the log-transformed data
$H_{(.95)}$ = quantiles obtained from tables provided by Land 1975
S_y = sample standard deviation of the log-transformed data

$$= \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} (y_i - \bar{y})^2}$$

Undetermined Distribution

If the distribution of the subunit data could not be adequately determined, a conservative non-parametric method was used to estimate the concentration term. Because of the uncertainty of an undefined distribution the non-parametric 95th percentile concentration was used as the concentration term. The initial step in this procedure is to order the data such that

$$x_1 \leq x_2 \leq \ldots \leq x_i \qquad \text{(B.2-7)}$$

where

$x_{j,\ (j=1\ to\ i)}$ = sample concentrations
i = the number of background samples

The 95th percentile concentration is then determined to be

$$x_k$$

such that

$$k \geq i \times 0.95 \ (i = \text{number of samples})$$

Example Calculations: Concentration Term (Normal Distribution)

Source: Active Flyash Pile Surface Soil

Parameter: Uranium-238

Sample ID	Conc. (pCi/g)	Conc. - Mean	(Conc. - Mean)^2
112091	2.88	-0.534	0.28546
112129	3.47	0.056	0.00310
112160	3.67	0.256	0.06539
112241	4.39	0.976	0.95202
112248	3.11	-0.304	0.09259
112249	3.05	-0.364	0.13270
112251	3.62	0.206	0.04232
112252	3.36	-0.054	0.00295
112254	2.95	-0.464	0.21556
112255	3.11	-0.304	0.09259
112257	3.5	0.086	0.00735
112258	3.37	-0.044	0.00196
112259	3.9	0.486	0.23592
112264	3.42	0.006	0.00003
Sum	47.8		2.12994

n = number of samples = 14

Mean = $\bar{x}$

Standard Deviation = s^2

95% Upper Confidence Limit on the Mean = x

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

$$= \frac{1}{14}\sum_{i=1}^{14} x_i$$

$$= \frac{1}{14}(47.8)$$

$$= 3.414$$

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})}$$

$$= \sqrt{\frac{1}{13}\sum_{i=1}^{14}(x_i - 3.414)}$$

$$= \sqrt{\frac{1}{13}(2.12994)}$$

$$= 0.40477$$

$$UCL_{.95} = \bar{x} + t_{(.95,n-1)} \times \frac{s}{\sqrt{n}}$$

$$= 3.414 + t_{(.95,13)} \times \frac{0.40477}{\sqrt{14}}$$

$$= 3.414 + 1.771 \times \frac{0.40477}{\sqrt{14}}$$

$$= 3.606$$

Concentration Term

The concentration term is defined as the smaller of the $UCL_{.95}$ or Maximum value detected. In other words, if the calculated $UCL_{.95}$ exceeds the maximum value detected than the Maximum value detected will be used as the concentration term.

For this example, 3.606 does not exceed the maximum detected value of 4.39 so the concentration term is determined to be 3.606 pCi/g.

Example Calculations: Concentration Term (LogNormal Distribution)
Source: Lime Sludge Ponds Surface Soil
Parameter: Uranium-238

Sample	Conc. (pCi/g)	ln(Conc.)	ln(Conc.)-Mean	[ln(Conc.)-Mean]^2
114467	8.49	2.1389	0.2124	0.0451
114474	6.54	1.8779	-0.0486	0.0024
114477	4.64	1.5347	-0.3918	0.1535
114485	6.67	1.8976	-0.0289	0.0008
114487	2.12	0.7514	-1.1751	1.3809
114488	6.69	1.9006	-0.0259	0.0007
114498	9.38	2.2386	0.3121	0.0974
114501	9.54	2.2555	0.3290	0.1082
114514	56.4	4.0325	2.1060	4.4350
114516	84	4.4308	2.5043	6.2715
114598	1.24	0.2151	-1.7114	2.9289
114881	0.856	-0.1555	-2.0820	4.3347
Sum		23.1182		19.7591

n = number of samples = 12

y = ln(concentration)

Mean of the Log-transformed data

$$\bar{y} = \frac{1}{n}\sum_{i=1}^{n} y_i$$

$$= \frac{1}{12}\sum_{i=1}^{12} y_i$$

$$= \frac{1}{12}\,(23.1182)$$

$$= 1.9265$$

Standard Deviation of the Log-transformed data

Upper Confidence Limit on the Mean

Note: The $H_{.95}$ value used in this equation is a two-way interpolation between n=10 and n=12 and between s_y=1.25 and s_y=1.50. An abbreviated version of Land's H-table can be found in Appendix

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$$s_y = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(y_i - \bar{y})}$$

$$= \sqrt{\frac{1}{11}\sum_{i=1}^{12}(y_i - 1.9265)}$$

$$= \sqrt{\frac{1}{11}(19.7591)}$$

$$= 1.34025$$

$$UCL_{.95} = e^{\bar{y} + \frac{s_y^2}{2} + \frac{s_y \times H_{.95}}{\sqrt{n-1}}}$$

$$= e^{1.9265 + \frac{1.34025^2}{2} + \frac{1.34025 \times 3.57204}{\sqrt{11}}}$$

$$= e^{4.2681}$$

$$= 71.39$$

A-12 in Gilbert, 1987.

Concentration Term

The concentration term is defined as the smaller of the $UCL_{.95}$ or Maximum value detected. In other words, if the calculated $UCL_{.95}$ exceeds the maximum value detected than the Maximum value detected will be used as the concentration term.

For this example, 71.39 does not exceed the maximum detected value of 84 so the concentration term is determined to be 71.39 pCi/g.

Example Calculations: Concentration Term (Undefined Distribution)

- Non-parametric Approach

Source: Lime Sludge Pile Waste Material

Parameter: Thorium-238

Sample	Conc. (pCi/g)	Adj. Conc.	Rank*
114485	< 0.224	0.112	1
114857	< 0.25	0.125	2
67904	< 0.6	0.3	3
67902	< 0.6	0.3	4
114881	0.037	0.037	5
114821	0.06	0.06	6
114734	0.082	0.082	7
114762	0.11	0.11	8
114812	0.112	0.112	9
114605	0.146	0.146	10
114487	0.22	0.22	11
114745	0.23	0.23	12
114835	0.53	0.53	13
114501	0.693	0.693	14
114498	0.841	0.841	15
114488	0.87	0.87	16
114570	0.88	0.88	17
114564	0.88	0.88	18
114591	0.92	0.92	19
114477	0.93	0.93	20
114600	0.947	0.947	21
114474	1.01	1.01	22
114510	1.05	1.05	23
114576	1.07	1.07	24
114467	1.13	1.13	25

Note: When ranking data all non-detected samples are placed at the bottom because of the unknown actual concentration. This procedure was uniformly applied throughout the statistical analyses.

Concentration Term

The Concentration Term determined from an undefined distribution is conservatively equated to the non-parametric 95th percentile value of the observed data. After ordering the data, the 95th percentile is defined as the smallest value whose rank exceeds or equals:

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$$k \geq n \times 0.95 \leq n \times 0.95+1$$

This is equivalent to always rounding the calculated rank, k, up to the next highest integer. In this example,

$$n = \text{the number of samples}$$
$$= 25$$

$$k = n \times 0.95$$
$$= 25 \times 0.95$$
$$= 23.75$$

The smallest value whose rank equals or exceeds the calculated rank of 23.75 is 1.07 (rank = 24). Thus, 1.07 pCi/g is used as the concentration term.

Comparison to Background Example: t-Test

Example: Surface Soil Uranium-238 - Lime Sludge Ponds vs. Background

Background Dataset: Surface Soil Uranium-238

SAMPLE ID	Conc.	Ln(Conc.)	Ln(Conc)-Mean	[Ln(Conc)-Mean]2
61622	1.06	0.0583	0.0196	0.000384
61626	1.04	0.0392	0.0005	0.000000
61629	0.85	-0.1625	-0.2012	0.040479
61632	1.01	0.0100	-0.0287	0.000825
61635	1.02	0.0198	-0.0189	0.000356
61638	1.08	0.0770	0.0383	0.001466
61640	0.99	-0.0101	-0.0487	0.002374
61644	1.06	0.0583	0.0196	0.000384
61647	0.9	-0.1054	-0.1440	0.020747
61650	1.01	0.0100	-0.0287	0.000825
61653	1.07	0.0677	0.0290	0.000840

SAMPLE ID	Conc.	Ln(Conc.)	Ln(Conc)-Mean	[Ln(Conc)-Mean]2
61656	0.98	-0.0202	-0.0589	0.003467
61659	1.33	0.2852	0.2465	0.060764
61663	1.01	0.0100	-0.0287	0.000825
61666	1.02	0.0198	-0.0189	0.000356
61668	1.13	0.1222	0.0835	0.006979
61670	1.02	0.0198	-0.0189	0.000356
61673	1.15	0.1398	0.1011	0.010218
61677	1.03	0.0296	-0.0091	0.000083
61679	1.21	0.1906	0.1519	0.023087
61682	0.94	-0.0619	-0.1006	0.010111
61685	0.91	-0.0943	-0.1330	0.017686
61689	0.92	-0.0834	-0.1221	0.014898
61692	1.11	0.1044	0.0657	0.004314
61696	1.09	0.0862	0.0475	0.002256
61698	1.08	0.0770	0.0383	0.001466
61702	0.93	-0.0726	-0.1112	0.012376
61705	1.21	0.1906	0.1519	0.023087
61708	0.99	-0.0101	-0.0487	0.002374
61711	1.18	0.1655	0.1268	0.016088
Sum		1.1603		0.279472

Using the same calculations for the Mean and Standard Deviation shown in the example calculations for the Concentration Term for a LogNormal Distribution we get:

Mean (log-transformed data): 0.0387

Standard Deviation (log-transformed data): 0.0982

And recalling the Lime Sludge Ponds Surface Soil Uranium Example with:

Mean: 1.9265

Std. Dev.: 1.34025

The t-Test is performed by calculating the t-statistic:

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$$t = \frac{\bar{x}_1 - \bar{x}_2}{sd\sqrt{\frac{1}{n} + \frac{1}{m}}}$$

where

$$sd^2 = \frac{\sum_{i=1}^{n}(x_{i1} - \bar{x}_1) + \sum_{j=1}^{m}(x_{j2} - \bar{x}_2)}{n + m - 2}$$

sd^2 is the estimate of the pooled variance. Using the Sum of the Squared differences ((ln(Conc.)-Mean)^2) from the Lime Sludge Ponds data (1) and Background data (2) the equation becomes:

$$sd^2 = \frac{(19.7591) + (0.2795)}{12 + 30 - 2}$$

$$= 0.5010$$

$$sd = \sqrt{0.5010}$$

$$= 0.7078$$

The t-statistic is then calculated:

$$t = \frac{(1.9265) - (0.0387)}{0.7078\sqrt{\frac{1}{12} + \frac{1}{30}}}$$

$$= \frac{1.8878}{0.7078 \times (.3416)}$$

$$= 7.81$$

This value is then compared to the value from the t-distribution table with degrees of freedom = n + m - 2 = 40, and an alpha = 0.05. The calculated t-statistic exceeds the tabulated value of 1.684 so we conclude that there is significant evidence to conclude that Lime Sludge Ponds Surface Soil Uranium-238 data exceed background surface soil levels.

Comparison to Background: Wilcoxon Rank Sum

Example: Surface Soil Uranium-238 - Inactive Flyash Pile vs. Background

Background	Combined Rank	Inactive Flyash Pile	Combined Rank
0.85	2	0.422	1
0.9	3	1.44	32
0.91	4	2.98	33
0.92	5	6.12	34
0.93	6	7.56	35
0.94	7	10.4	36
0.98	8	11.2	37
0.99[1]	9.5		
0.99[1]	9.5		
1.01[2]	12		
1.01[2]	12		
1.01[2]	12		
1.02[3]	15		
1.02[3]	15		
1.02[3]	15		
1.03	17		
1.04	18		
1.06[4]	19.5		
1.06[4]	19.5		
1.07	21		
1.08[5]	22.5		
1.08[5]	22.5		
1.09	24		
1.11	25		
1.13	26		
1.15	27		
1.18	28		
1.21[6]	29.5		
1.21[6]	29.5		
1.33	31		
		W_{rs} =	208

000081

Theory

If the site data and the background data were actually from the same population (i.e. the site data showed no environmental impact, therefore there was no difference) then it would be expected that random samples drawn from the same population would have an equal dispersion of ranks. If the ranks of the site data population are inordinately high in relation to those of the background dataset then we would conclude that there is evidence of environmental impact.

Test Statistic

If there are no tied values:

$$Z_{rs} = \frac{W_{rs} - \frac{n_1(m+1)}{2}}{\sqrt{\frac{n_1 n_2 (m+1)}{12}}}$$

If there are ties values:

$$Z_{rs} = \frac{W_{rs} - \frac{n_1(m+1)}{2}}{\sqrt{\frac{n_1 n_2}{12}\left(m + 1 - \frac{\sum_{j=1}^{g} t_j(t_j^2 - 1)}{m(m-1)}\right)}}$$

This value is then compared to the Standard Normal Table. For our example, there are ties so the later formula will be used.

W_{rs} = sum of the site ranks = 208

n_1 = number of sample from the Inactive Flyash Pile dataset = 7

n_2 = number of sample from the background dataset = 30

$m = n_1 + n_2 = 37$

g = number of tied groups = 6 (0.99(2), 1.01(3), 1.02(3), 1.06(2), 1.08(2), 1.21(2))

t_j = number of tied values in the jth tie group (2,3,3,2,2,2)

The test statistic is computed

$$Z_{RS} = \frac{208 - \frac{7(37+1)}{2}}{\sqrt{\frac{7 \times 30}{12}\left(37 + 1 - \frac{2(2^2-1)+3(3^2-1)+3(3^2-1)+2(2^2-1)+2(2^2-1)+2(2^2-1)}{37(37-1)}\right)}}$$

$$= \frac{208 - 133}{\sqrt{17.5\ (38 - \frac{6+24+24+6+6+6}{1332})}}$$

$$= \frac{75}{\sqrt{17.5\ (38 - \frac{72}{1332})}}$$

$$= \frac{75}{\sqrt{664.054}}$$

$$= 2.91$$

This value exceeds the $Z_{1-.05}$ value of 1:645 from the Standard Normal Table so we conclude that there is sufficient evidence to conclude that the Uranium-238 concentration in the Inactive Flyash Pile Surface Soil significantly exceed the concentrations observed in the background at the alpha = 0.05 significance level.

Secondary Statistical Screening: 95th Percentile Test

Example: Surface Soil Uranium-238 - Active Flyash Pile vs. Background

Purpose

The 95th Percentile test is performed as 'hot spot' analysis. Some sample distributions may not have significant differences in mean concentrations from background. But, these same sample distributions may also contain one or more high values that are not consistent with background levels but have been 'averaged-out'. The 95th percentile test is used to detect high values that exceed the expected range of concentrations if the data agreed with background levels. It is only necessary to test the maximum observed site sample versus the background 95th percentile to conclude that there are present values that exceed the expected range of background concentrations.

The background surface soil Uranium-238 data has been determined to be LogNormally distributed by the methods outlined in Section B.2.3.4.1. The appropriate equation (see Section B.2.3.5.1) for the 95th percentile of a lognormally distributed dataset is:

$$P_{95} = e^{\bar{y} + Z_{0.95} \times S_y}$$

In this example:
Mean (log-transformed data): 0.0387

Standard Deviation (log-transformed data): 0.0982

$Z_{0.95}$ (from the Standard Normal table): 1.645

$$P_{95} = e^{\bar{y} + Z_{0.95} \times S_y}$$

$$= e^{0.0387 + 1.645 \times 0.0982}$$

$$= e^{0.20024}$$

$$= 1.22$$

The maximum value observed in the Active Flyash Pile Surface Soil Uranium-238 of 4.39 pCi/g exceeds the calculated background 95th percentile of 1.22 pCi/g. We would then conclude that there is present at least one high value outside the expected range of background and, therefore, Active Flyash Pile Surface Soil Uranium-238 would be determined to be a CPC. (Note: If Active Flyash Pile Surface Soil Uranium-238 had already been determined to be a CPC by the initial step, t-Test or WRS, then the 95th percentile test would be redundant. This test is only performed if the sample dataset does not test at being significantly different in the previous tests.)

B.2.4A Identification of Constituents of Potential Concern (CPCs)

B.2.4A.1 Comparison to Background

The first step in selecting CPCs is to compare the concentration term to background concentrations. To conduct the comparison between the site-related measurements and the background data for a

constituent, two tests were used in sequence: (1) a "location" test (Student's t-test or Wilcoxon Rank Sum test) and (2) followed by the "95th Percentile Test" (see below for details). If either of the test results rejects the null hypothesis that the site data is equal to background (i.e., the distribution of measurements at the site appears to be shifted to the right (to higher measurements) of the background distribution), the constituent is considered to be a possible CPC and is submitted to toxicological screening. The constituent is not included as a possible CPC only if both test results indicate that there was not a "significant difference" between the two distributions. For cases where the location tests could not be performed due to small sample sizes or large portion of nondetects and the 95th Percentile Test suggests that the site-related data are not different from the background data, professional judgement by risk assessors was used to make the final determination.

The "location" test can be either the t-test, a parametric statistical method, or the Wilcoxon Rank Sum (WRS) test (or the Mann-Whitney U-test, a direct corollary to the WRS) which is the counterpart of the t-test in a nonparametric approach. The t-test was used to compare the mean of the site-related data with the mean of the background data. The WRS test compares two distributions of rank ordered data (equivalent proportions of ranks would indicate similar distributions). The criteria for conducting the t-test are presented in Figure B.2-4. For cases in which the t-test cannot be applied to the data, the WRS test was conducted.

The 95th Percentile Test determines if any sample measurements for a given constituent exceed the upper 95th percentile for the background distribution. If so, the test indicates that the data contains at least one relatively high concentration and the constituent should be considered as a CPC. The 95th percentile for the background distribution can be computed as follows:

For background data with a normal distribution (Gilbert 1987):

$$P_{95} = \bar{x} + z_{0.95} * s \qquad \text{(B.2-2)}$$

where:

$\bar{x}$ = sample arithmetic mean

s = sample standard deviation

$z_{0.95}$ = 1.645

For background data with a lognormal distribution (Gilbert, 1987):

$$P_{95} = \exp(\bar{y} + z_{0.95} * s_y) \quad \text{(B.2-3)}$$

where:

$\bar{y}$ = sample arithmetic mean of the log-transformed data

($y = \ln x$; $\bar{y} = \Sigma y/n$)

s_y = sample standard deviation of the log-transformed data

$z_{0.95}$ = 1.645

Undetermined Distribution (USEPA, 1992g, p.7-52)

If the distribution of the background data could not be adequately determined, a conservative non-parametric method was used to estimate the concentration term. Because of the uncertainty of an undefined distribution the non-parametric 95th percentile concentration was used as the concentration term. The initial step in this procedure is to order the data such that

$$x_1 \leq x_2 \leq \ldots \leq x_i \quad \text{(B.2-4)}$$

where

$x_{j,\,(j=1\ \text{to}\ i)}$ = sample concentrations

i = the number of background samples

The 95th percentile concentration is then determined to be

$$x_k$$

such that

$$k \geq i \times 0.95 \ (i = \text{number of samples})$$

Because organic chemicals, some fission product radionuclides, and activation product radionuclides are not naturally occurring at measurable levels, background concentrations are assumed to be zero.

Consequently, if these organic chemicals, fission products, or activation products are selected as CPCs, they are not based on comparison to background.

Table B.2-2E presents the constituents that were eliminated based on statistical (background and 95th percentile) screening. All compounds determined to be present above background concentrations were considered to be CPCs and were then subjected to toxicological screening.

B.2.4A.2 Toxicological Screening

After statistical comparisons to background and the 95th percentile were made, detected constituents which have been shown to exceed background were subjected to toxicological screening to exclude constituent that are unlikely to have a human health risk at levels detected. The following criteria were used to eliminate constituents based on toxicological screening:

- Constituents which were detected only once in one medium and not found in any other media were removed.
- Constituents which are essential micronutrients and macronutrients that were nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe, etc.) were removed.
- Constituents that were ubiquitous in nature and considered to become nontoxic (e.g., Al, Si, Cl) were removed.
- Nonspecific classes of chemical compounds (e.g., TOC, TPH, PAH, CH, etc.) were removed.
- Constituents with representative concentrations lower than the values calculated from U.S. EPA RAGs Part B, based on a HI of 0.1 and risk level of 1.0×10^{-7}, were removed.

Group A/B chemical carcinogens (see Section B.2.5.1.2) and radionuclides which were present above background and the 95th percentile were retained as CPCs.

B.2.4A.2.1 Initial Toxicological Screening

The initial toxicological screening consisted of the first four criteria presented above. Once the background and the 95th percentile comparisons were made, possible CPCs for surface soil, subsurface soil, surface water, perched water, and groundwater were subjected to the initial toxicological screening.

Constituents were evaluated for their presence and persistence in more than one medium for that subunit. If a constituent was detected only once in one medium (i.e., not found in any other media), it

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TABLE B.2.2E

CONSTITUENTS ELIMINATED BASED STATISTICAL SCREENING[a,b]

Surface Soil[c,d]	Subsurface Soil[c,d]	Sediment[c,d]
ACTIVE FLYASH PILE		
Aluminum	Calcium	Aluminum
Iron	Magnesium	Arsenic
Manganese	Manganese	Cadmium
Silicon	Potassium	Chromium
		Cobalt
		Iron
		Manganese
		Nickel
		Potassium
		Silicon
		Thallium
		Vanadium
		Zinc
		Cesium-137
		Radium-226
		Radium-228
		Thorium-228
		Thorium-230
SOUTH FIELD		
Cobalt	Aluminum[c]	Manganese
Silicon	Antimony[c]	Silicon
	Boron	Cesium-137
	Calcium[c]	
	Cobalt[c]	
	Iron[c]	
	Magnesium[c]	
	Manganese[c]	
	Nickel[c]	
	Potassium[c]	
	Selenium[c]	
	Silicon[c]	
	Thallium[c]	
	Zinc[c]	
	Strontium-90[c]	
	Technetium-99[c]	

See footnotes at end of table

TABLE B.2-2E
(Continued)

Surface Soil[c,d]	Subsurface Soil[c,d]	Sediment[c,d]
INACTIVE FLYASH PILE		
Aluminum	Aluminum[c]	Aluminum
Chromium	Antimony[c]	Arsenic
Cobalt	Boron	Barium
Iron	Calcium[c]	Cadmium
Manganese	Cobalt[c]	Chromium
Nickel	Iron[c]	Cobalt
Silicon	Magnesium[c]	Copper
Zinc	Manganese[c]	Cyanide
Cesium-137	Nickel[c]	Iron
	Potassium[c]	Lead
	Selenium[c]	Manganese
	Silicon[c]	Nickel
	Thallium[c]	Potassium
	Zinc[c]	Silicon
	Strontium-90[c]	Thallium
	Technetium-99[c]	Vanadium
		Zinc
		Radium-226
		Radium-228
		Thorium-228
		Thorium-230
		Thorium-232
		Thorium-Total
		Uranium-235/236
SOLID WASTE LANDFILL		
Cadmium[d]	Boron	Aluminum
Cobalt		Arsenic
Manganese		Barium
Selenium		Chromium
Silicon		Cobalt
Cesium-137		Iron
		Lead
		Nickel
		Potassium
		Silicon
		Vanadium

See footnotes at end of table

TABLE B.2-2E
(Continued)

Surface Soil[c,d]	Subsurface Soil[c,d]	Sediment[c,d]
	SOLID WASTE LANDFILL (Continued)	
		Radium-226
		Radium-228
		Thorium-228
		Thorium-230
		Thorium-232
	LIME SLUDGE PONDS[f]	
Cobalt	Magnesium	
Manganese	Thorium-232	
Selenium		

[a]Constituents were eliminated because they were present below background (initial screening) or the 95th percentile (secondary screening) concentrations.

[b]Statistical screening was not performed on surface water samples because background data is not available.

[c]Initial screening: CPC is removed if concentration term is below background.

[d]Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile concentration.

[e]Initial screening was not performed on sediment samples because background data is not available. However, secondary screening was performed using the 95th percentile concentrations from surface soil for comparison.

[f]Constituents in the subsurface soil column are from waste material in the Lime Sludge Ponds.

was removed from the possible CPC list. For example, 2-chlorophenol was detected in one sample of subsurface soil for the Active Flyash Pile and not found in any other media for that subunit, therefore, it was removed from the possible CPC list.

Possible CPCs were next subjected to screening based on them being an essential macronutrient or micronutrient present at nontoxic levels. Constituents eliminated based on this criteria included aluminum, sodium, potassium, magnesium, calcium, and iron.

The third criteria evaluated constituents based on them being ubiquitous in nature and considered to become nontoxic. Such constituents included aluminum, silicon, and chloride. Silicon and chloride were the predominant constituent eliminated based on this criteria.

The last criteria of the initial toxicological screening included removal of constituents which were from nonspecific classes of chemical compounds. Such constituents included total organic compounds, total petroleum hydrocarbons, polynuclear aromatic hydrocarbons, chlorinated hydrocarbons, and general aqueous chemicals (e.g., ammonia, chloride, fluoride, sulfate, sulfide, etc.).

Table B.2-2F presents the constituents eliminated from each subunit based on the initial toxicological screening.

B.2.4A.2.2 Secondary Toxicological Screening

Possible CPCs remaining after the initial toxicological screening were subjected to a secondary toxicological screening which included a qualitative comparison of concentration terms to screening values calculated using the following EPA Risk Assessment Guidance (RAGs) Part B (EPA 1991d) reduced equations for residential land use soil and water based on 30 years of exposure.

Residential Soil for Chemicals

Carcinogenic

$$\text{Risk-based PRG} = 0.64/SF_o \quad \text{(mg/kg; target risk} = 10^{-7}) \qquad \text{(B.2-8a)}$$

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TABLE B.2.2.F

CONSTITUENTS ELIMINATED BASED INITIAL TOXICOLOGICAL SCREENING[a]

Surface Soil	Subsurface Soil	Surface Water	Sediment
ACTIVE FLYASH PILE			
Calcium[c]	Aluminum[c]	Calcium[c]	Calcium[c]
Iron[c]	Iron[c]	Iron[c]	Magnesium[c]
Magnesium[c]	Sodium[c]	Magnesium[c]	Sodium[c]
Potassium[c]	2-Chlorophenol[b]	Manganese[c]	Ammonia[e]
Sodium[c]	4-Chloro-3-methylphenol[b]	Potassium[c]	Chloride[e]
	4-Nitrophenol[b]	Selenium[c]	Fluoride[e]
	Di-n-octylphthalate[b]	Silicon[d]	Nitrate[e]
	1,1-Dichloroethane[b]	Sodium[c]	Phosphorous[e]
	1,1-Dichloroethene[b]	Alkalinity[e]	Sulfate[e]
	1,2-Dichlrorethane[b]	Ammonia[e]	Total Organic
	2-Hexanone[b]	Chloride[e]	Nitrogen[e]
	Benzene[b]	Fluoride[e]	
	Bromomethane[b]	Nitrate[e]	
	Chloroethane[b]	Phenols[e]	
	Chloroform[b]	Phosphorous[e]	
	Vinyl chloride[b]	Sulfate[e]	
	Xylenes, total[b]	Sulfide[e]	
		Total Kjeldahl Nitrogen[e]	
		Total Organic Carbon[e]	
		Total Organic Halides[e]	
		Total Organic Nitrogen[e]	
		Total Phosphorous[e]	
SOUTH FIELD			
Aluminum[c]	Sodium[c]	Aluminum[c]	Aluminum[c]
Calcium[c]	Total Organic Carbon[e]	Calcium[c]	Calcium[c]
Iron[c]		Magnesium[c]	Iron[c]
Magnesium[c]		Potassium[c]	Magnesium[c]
Potassium[c]		Silicon[c]	Potassium[c]
Sodium[c]		Sodium[c]	Sodium[c]
		Alkalinity[e]	
		Chloride[e]	

See footnotes at end of table

TABLE B.2.2.F
(Continued)

Surface Soil	Subsurface Soil	Surface Water	Sediment
		SOUTH FIELD (Continued)	
		Fluoride[e]	
		Phosphorous[e]	
		Sulfate[e]	
		Total Kjeldahl Nitrogen[e]	
		Total Organic Carbon[e]	
		Total Organic Nitrogen[e]	
		Total Phosphorous[e]	
		INACTIVE FLYASH PILE	
Calcium[c]	Sodium[c]	Aluminum[c]	Aluminum[c]
Potassium[c]	Total Organic Carbon[e]	Calcium[c]	Calcium[c]
Sodium[c]		Iron[c]	Iron[c]
Fluorene[c]		Magnesium[c]	Magnesium[c]
		Potassium[c]	Potassium[c]
		Sodium[c]	Silicon[d]
		Alkalinity[e]	Sodium[c]
		Ammonia[e]	Alkalinity[e]
		Chloride[e]	Ammonia[e]
		Fluoride[e]	Chloride[e]
		Nitrate[e]	Fluoride[e]
		Phosphorous[e]	Nitrate[e]
		Sulfate[e]	Phosphorous[e]
		Total Kjeldahl Nitrogen[e]	Sulfate[e]
		Total Organic Carbon[e]	Total Kjeldahl Nitrogen[e]
		Total Organic Halides[e]	Total Organic Carbon[e]
		Total Organic Nitrogen[e]	Total Organic Halides[e]
		Total Phosphorous[e]	Total Organic Nitrogen[e]
			Total Phosphorous[e]
		SOLID WASTE LANDFILL	
Aluminum[c]	Aluminum[c]	Silicon[d]	Calcium[c]
Calcium[c]	Potassium[c]		Magnesium[c]
Iron[c]	Sodium[c]		Sodium[c]
Magnesium[c]	Acenaphthylene[b]		

See footnotes at end of table

TABLE B.2.2.F
(Continued)

Surface Soil	Subsurface Soil	Surface Water	Sediment
	SOLID WASTE LANDFILL (Continued)		
Potassium[c]	Carbon Disulfide[b]	Alkglinitz[e]	
Silicon[d]	Dichlorodifluoromethane[b]	Chloride[e]	
Sodium[c]	Pyridine[b]	Fluoride[e]	
	Styrene[b]	Nitrate[c]	
	Trichlorofluoromethane[b]	Phosphorous[e]	
	Vinyl chloride[b]	Sulfate[e]	
	Sulfide[e]	Total Kjeldahl Nitrogen[e]	
	1,2,3,4,6,7,8-heptachlorodibenzofuran[b]		
	1,2,3,5,6,7,8-heptachlorodibenzo-p-dioxin[b]		
	Endosulfan sulfate		
	Endrin aldehyde[b]		
	Total Organic Carbon[e]	Total Organic Carbon[e]	
	Endosulfan II[b]	Total Organic Halides[e]	
		Total Organic Nitrogen[e]	
		Total Phosphorous[e]	
	LIME SLUDGE PONDS[f]		
Aluminum[c]	Aluminum[c]		
Calcium[c]	Iron[c]		
Iron[c]	Potassium[c]		
Magnesium[c]	Silicon[d]		
Potassium[c]	1,1-Dichloroethane[b]		
Silicon[d]	2-Butanone[b]		
Sodium[c]	Idomethane[b]		

[a]Constituents were eliminated based on the first four toxicological screening criteria (i.e., detected once in one medium; macronutrient/micronutrient that is nontoxic; ubiquitous in nature; and nonspecific class of compounds).
[b]Constituent was removed because it was detected only once in one medium (not detected in any other media).
[c]Constituent was removed because it is an essential macronutrient and macronutrient that is nontoxic at the levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
[d]Constituent was removed because it is ubiquitous in nature and considered to become nontoxic (e.g., Al, Si, Cl).
[e]Constituent was removed because it is from a nonspecific class of chemical compounds (e.g., TOC, TPH, PAH, CH, and general aqueous chemicals).
[f]Constituents in the subsurface soil column are from waste material in the Lime Sludge Ponds.

SF_o = oral slope factor $(mg/kg\text{-}day)^{-1}$

Noncarcinogenic

Risk-based PRG = $2.7 \times 10^5(RfD_o)$ (B.2-8b)

(mg/kg; target hazard = 0.1)

RfD_o = oral chronic reference dose (mg/kg-day)

Residential Soil for Radionuclides

Carcinogenic

Risk-based PRG = $1.0 \times 10^{-6}/1.3 \times 10^3(SF_o) + 3.4 \times 10^6(SF_e)$ (B.2-9)

(pCi/g; target risk = 10^{-7})

SF_o = oral slope factor (risk/pCi)

SF_e = external exposure slope factor (risk/yr per pCi/m^2)

Residential Water for Chemicals

Carcinogenic

Risk-based PRG = $1.7 \times 10^{-4}/2(SF_o) + 7.5(SF_i)$ (B.2-10a)

(mg/L; target risk = 10^{-7})

SF_o = oral slope factor $(mg/kg\text{-}day)^{-1}$

SF_i = inhalation slope factor $(mg/kg\text{-}day)^{-1}$

Noncarcinogenic

Risk-based PRG = $73/[7.5/RfD_i + 2/RfD_o]$ (B.2-10b)

(mg/L; target hazard = 0.1)

RfD_o = oral chronic reference dose (mg/kg-day)

RfD_i = inhalation chronic reference dose (mg/kg-day)

Residential Water for Radionuclides

Carcinogenic

$$\text{Risk-based PRG} = 9.5 \times 10^{-11}/2(SF_o) + 7.5(SF_i) \quad \text{(B.2-11)}$$

(pCi/g; target risk = 10^{-7})

SF_o = oral slope factor (risk/pCi)

SF_i = inhalation slope factor (risk/pCi)

It is important to note that although the purpose of these equations are to develop risk-based concentrations to be used as preliminary remediation goals (PRGs), their use in this baseline risk assessment was to develop screening levels for which concentration terms were compared.

As a point of departure from EPA RAGs Part B (EPA 1991d) and the National Oil and Hazardous Substances Contingency Plan (EPA 1990f) which recommends that the risk-based concentrations correspond to a risk level of 1.0×10^{-6} for carcinogens and a hazard index (HI) of 1.0 for noncarcinogens. Risk based concentrations for Operable Unit 2 screening were derived to correspond to a risk level of 1.0×10^{-7} and HI of 0.1 so that the screening levels conservatively account for the additive nature of the relative risk contributions from individual CPCs.

Deviation of risk-based concentrations were based on the availability of established toxicity criteria (i.e., slope factors and reference doses). The slope factor- or reference dose-based risk based concentration became the screening level. Screening levels were selected as the lower of the two values for constituents where both slope factor- and reference dose-based concentrations were derived. For constituents with no toxicity criteria established, screening levels were not determined. Tables B.2-2G and B.2-2H present the risk-based screening levels developed for soil and water, respectively.

The soil risk-based screening levels were compared with surface soil and subsurface soil concentration terms. Although the residential soil equation is for use with surface soil, the same screening values were used for comparison of subsurface soils. This is construed as conservative because direct contact to subsurface soil is less frequent.

TABLE B.2-2G

SOIL RISK-BASED SCREENING LEVELS DEVELOPED FROM EPA RAGS, PART B[a]

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
aluminum				ND	ND	ND
antimony			4.0E-04	ND	1.08E+01	1.08E+01
arsenic	1.75E+00		3.0E-04	3.66E-02	8.10E+00	3.66E-02
barium			7.0E-02	ND	1.89E+03	1.89E+03
beryllium	4.3E+00			1.49E-02	ND	1.49E-02
boron			9.0E-02	ND	2.43E+03	2.43E+03
cadmium			1.0E-03	ND	2.70E+01	2.70E+01
calcium				ND	ND	ND
chromium vi			0.005	ND	1.35E+02	1.35E+02
cobalt			0.06	ND	1.62E+03	1.62E+03
copper			0.037	ND	9.99E+02	9.99E+02
cyanide			0.02	ND	5.40E+02	5.40E+02
iron				ND	ND	ND
lead				ND	ND	ND
magnesium			9.7	ND	2.62E+05	2.62E+05
manganese			0.14	ND	3.78E+03	3.78E+03
mercury			0.0003	ND	8.10E+00	8.10E+00
molybdenum			0.005	ND	1.35E+02	1.35E+02
nickel			0:02	ND	5.40E+02	5.40E+02

See footnotes at end of table

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TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
potassium				ND	ND	ND
selenium			0.005	ND	1.35E+02	1.35E+02
silicon				ND	ND	ND
silver			0.005	ND	1.35E+02	1.35E+02
sodium				ND	ND	ND
thallium			0.00007	ND	1.89E+00	1.89E+00
thorium-total				ND	ND	ND
uranium-total			0.003	ND	8.10E+01	8.10E+01
vanadium			0.007	ND	1.89E+02	1.89E+02
zinc			0.3	ND	8.10E+03	8.10E+03
1,1,1-trichloroethane				ND	ND	0.00
1,1,2,2-tetrachloroethane	0.2			3.20E-01	ND	3.20E-01
1,1,2-trichloroethane	0.057		0.004	1.12E+00	1.08E+02	1.12E+00
1,1,2-trichlorotrifluoroethane				ND	ND	ND
1,1-dichloroethane			0.1	ND	2.70E+03	2.70E+03
1,1-dichloroethene	0.61		0.009	1.05E-01	2.43E+02	1.05E-01
1,2,4-trichlorobenzene			0.01	ND	2.70E+02	2.70E+02
1,2-dichloroethane	0.091			7.03E-01	ND	7.03E-01
1,2-dichloroethene			0.009	ND	2.43E+02	2.43E+02
1,2-dichloropropane				ND	ND	ND

See footnotes at end of table

TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
1,2-diethylbenzene				ND	ND	ND
1,4-dichlorobenzene	0.024			2.67E+00	ND	2.67E+00
1,4-dioxane				ND	ND	ND
2,4,6-trichlorophenol	0.011			5.82E+00	ND	5.82E+00
2,4-dichlorophenol			0.003	ND	8.10E+01	8.10E+01
2,4-dinitrophenol			0.002	ND	5.40E+01	5.40E+01
2,4-dinitrotoluene	0.68		0.002	9.41E-02	5.40E+01	9.41E-02
2-butanone			0.6	ND	1.62E+04	1.62E+04
2,6-dinitrotoluene	0.68		0.001	9.41E-02	2.70E+01	9.41E-02
2-chlorophenol			0.005	ND	1.35E+02	1.35E+02
2-hexanone			0.04	ND	1.08E+03	1.08E+03
2-methylnaphthalene				ND	ND	ND
2-nitroanaline				ND	ND	ND
2-nitrophenol				ND	ND	ND
3,3-dichlorobenzidene	0.45			1.42E-01	ND	1.42E-01
3-chloropropene				ND	ND	ND
3-nitroanaline			0.003	ND	8.10E+01	8.10E+01
4-chloro-3-methylphenol				ND	ND	ND
4-methyl-2-pentanone			0.05	ND	1.35E+03	1.35E+03
4-methylphenol	4		0.005	1.60E-02	1.35E+02	1.60E-02

See footnotes at end of table

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TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] (mg/Kg/day)$^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens (TR[e] = 10^{-7}) (mg/kg;pCi/g)	Toxicants (HI[d,f] = 0.1) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
4-nitrophenol				ND	ND	0.00
acetone			0.1	ND	2.70E+03	2.70E+03
acetonitrile			0.006	ND	1.62E+02	1.62E+02
acrylonitrile	0.54			1.19E-01	ND	1.19E-01
benzene	0.029			2.21E+00	ND	2.21E+00
benzoic acid			4	ND	1.08E+05	1.08E+05
butyl benzyl phthalate			0.2	ND	5.40E+03	5.40E+03
bis(2-ethylhexyl)phthalate	0.014		0.02	4.57E+00	5.40E+02	4.57E+00
bromodichloromethane	0.062		0.02	1.03E+00	5.40E+02	1.03E+00
bromoform	0.0079		0.02	8.10E+00	5.40E+02	8.10E+00
bromomethane			0.0014	ND	3.78E+01	3.78E+01
carbazole	0.02			3.20E+00	ND	3.20E+00
carbon disulfide			0.1	ND	2.70E+03	2.70E+03
carbon tetrachloride	0.131		0.0007	4.89E-01	1.89E+01	4.89E-01
chlorobenzene			0.02	ND	5.40E+02	5.40E+02
chloroform	0.0061		0.01	1.05E+01	2.70E+02	1.05E+01
chloromethane	0.013			4.92E+00	ND	4.92E+00
chrysene	0.0073			8.77E+00	ND	8.77E+00
dibromochloromethane	0.084		0.02	7.62E-01	5.40E+02	7.62E-01
dichlorofluoromethane				ND	ND	0.00

See footnotes at end of table

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TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
diethyl phthalate			0.8	ND	2.16E+04	2.16E+04
dimethyl phthalate			1	ND	2.70E+04	2.70E+04
di-n-butyl phthalate			0.1	ND	2.70E+03	2.70E+03
di-n-octyl phthalate			0.02	ND	5.40E+02	5.40E+02
ethylbenzene			0.1	ND	2.70E+03	2.70E+03
hexachlorobenzene	1.6		0.0008	4.00E-02	2.16E+01	4.00E-02
hexachloroethane	0.014		0.001	4.57E+00	2.70E+01	4.57E+00
hexane			0.06	ND	1.62E+03	1.62E+03
iodomethane				ND	ND	ND
isophorone	0.0041		2	1.56E+01	5.40E+04	1.56E+01
methylene chloride	0.0075		0.061	8.53E+00	1.65E+03	8.53E+00
naphthalene			0.04	ND	1.08E+03	1.08E+03
n-nitrosodiphenylamine	0.0049			1.31E+01	ND	1.31E+01
n-nitrosodipropylamine	7			9.14E-03	ND	9.14E-03
pentachlorophenol	0.12		0.03	5.33E-01	8.10E+02	5.33E-01
phenol			0.6	ND	1.62E+04	1.62E+04
pyrene			0.003	ND	8.10E+01	8.10E+01
pyridine			0.01	ND	2.70E+02	2.70E+02
styrene	0.03		0.2	2.13E+00	5.40E+03	2.13E+00
tetrachloroethene	0.052		0.01	1.23E+00	2.70E+02	1.23E+00

See footnotes at end of table

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TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
tetrachloroethylene	0.052		0.01	1.23E+00	2.70E+02	1.23E+00
toluene			0.2	ND	5.40E+03	5.40E+03
tributyl phosphate			0.005	ND	1.35E+02	1.35E+02
trichloroethene	0.011			5.82E+00	ND	5.82E+00
trichlorofluoromethane			0.3	ND	8.10E+03	8.10E+03
vinyl acentate			1	ND	2.70E+04	2.70E+04
vinyl chloride	1.9			3.37E-02	ND	3.37E-02
xylenes, total			2	ND	5.40E+04	5.40E+04
acenaphthene			0.06	ND	1.62E+03	1.62E+03
acenaphthylene			0.06	ND	1.62E+03	1.62E+03
anthracene			0.3	ND	8.10E+03	8.10E+03
benzo(g,h,i)perylene				ND	ND	ND
dibenzofuran			0.004	ND	1.08E+02	1.08E+02
fluoranthene			0.04	ND	1.08E+03	1.08E+03
fluorene			0.04	ND	1.08E+03	1.08E+03
phenanthrene				ND	ND	ND
benzo(a)anthracene	0.73			8.77E-02	ND	8.77E-02
benzo(a)pyrene	7.3			8.77E-03	ND	8.77E-03
benzo(b)fluoranthene	0.73			8.77E-02	ND	8.77E-02
benzo(k)fluoranthene	0.073			8.77E-01	ND	8.77E-01

See footnotes at end of table

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TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
chrysene	0.0073			8.77e+00	ND	8.77E+00
dibenzo(a,h)anthracene	7.3			8.77E-03	ND	8.77E-03
indeno(1,2,3-cd)pyrene	0.73			8.77E-02	ND	8.77E-02
4,4-ddd	0.24			2.67E-01	ND	2.67E-01
4,4-ddE	0.34			1.88E-01	ND	1.88E-01
4,4-ddt	0.34		0.0005	1.88E-01	1.35E+01	1.88E-01
aldrin	17		0.00003	3.76E-03	8.10E-01	3.76E-03
alpha bhc	6.3			1.02E-02	ND	1.02E-02
aroclor-1248	7.7			8.31E-03	ND	8.31E-03
aroclor-1254	7.7			8.31E-03	ND	8.31E-03
aroclor-1260	7.7			8.31E-03	ND	8.31E-03
alpha-chlorodane	1.3		0.00006	4.92E-02	1.62E+00	4.92E-02
beta bhc	1.8			3.56E-02	ND	3.56E-02
gamma-chlorodane	1.3		0.00006	4.92E-02	1.62E+00	4.92E-02
chlorodane	1.3		0.00006	4.92E-02	1.62E+00	4.92E-02
delta bhc				ND	ND	ND
diazinon			0.0009	ND	2.43e+01	2.43E+01
dieldrin	16		0.00005	4.00E-03	1.35E+00	4.00E-03
endosulfan I			0.006	ND	1.62E+02	1.62E+02
endosulfan II			0.00005	ND	1.35E+00	1.35E+00

See footnotes at end of table

TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
endrin			0.0003	ND	8.10E+00	8.10E+00
Endrin ketone			0.00034	ND	9.18E+00	9.18E+00
gamma chlorodane				ND	ND	ND
heptachlor	4.5		0.0005	1.42E-02	1.35E+01	1.42E-02
heptachlor epoxide	9.1		0.000013	7.03E-03	3.51E-01	7.03E-03
lindane			0.0003	ND	8.10E+00	8.10E+00
malathion			0.02	ND	5.40E+02	5.40E+02
methoxychlor			5.0E-02	ND	1.35E+02	1.35E+02
toxaphene	1.1			5.82E-02	ND	5.82E-02
heptachlorodibenzofuran	1500			4.27E-05	ND	4.27E-05
heptachlorodibenzo-p-dioxin	1500			4.27E-05	ND	4.27E-05
hexachlorodibenzofuran	15000			4.27E-06	ND	4.27e-06
hexachlorodibenzo-p-dioxin	15000			4.27E-06	ND	4.27E-06
octachlorodibenzofuran	150			4.27E-04	ND	4.27E-04
octachlorodibenzo-p-dioxin	150			4.27E-04	ND	4.27E-04
pentachlorodibenzofuran	7500			8.53E-06	ND	8.53E-06
tetrachlorodibenzofuran	15000			4.27E-06	ND	4.27E-06
tetrachlorodibenzo-p-dioxin	150000			4.27E-07	ND	4.27E-07
ammonia				ND	ND	0.00
chloride				ND	ND	ND

See footnotes at end of table

TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
fluoride			6.0E-02	ND	1.62E+03	1.62E+03
nitrate			1.6E+00	ND	4.32E+04	4.32E+04
nitrite			1.0E-01	ND	2.70E+03	2.70E+03
sulfate				ND	ND	ND
Cs-137+1d	2.800E-11	2.0E-06		1.47E-08	ND	1.47E-08
Np-237+1d	2.200E-10	4.3E-07		6.84E-08	ND	6.84E-08
Pb-210+2d	7.0E-10	1.60E-10		1.84E-04	ND	1.84E-04
Pu-238	2.200E-10	2.80E-11		1.05E-03	ND	1.05E-03
Ra-226+5d	1.200E-10	6.0E-06		4.90E-09	ND	4.90E-09
Ra-226+8d	8.00E-10	6.0E-06		4.90E-09	ND	4.90E-09
Ra-228	1.000E-10			7.69E-01	ND	7.69E-01
Ra-228+1d	1.000E-10	2.90E-6		1.01E-08	ND	1.01E-08
Sr-90+1d	3.600E-11			2.14E+00	ND	2.14E+00
Tc-99	1.300E-12	6.00E-13		4.90E-02	ND	4.90E-02
Th-228	1.100E-11	6.0E-10		5.35E-05	ND	5.35E-05
Th-228+7d	5.500E-11	5.6E-6		5.25E-09	ND	5.25E-09
Th-230	1.300E-11	5.40E-11		5.45E-04	ND	5.45E-04
Th-232	1.200E-11	2.60E-11		1.13E-03	ND	1.13E-03
Th-232+10d	1.700E-10	8.5E-6		3.46E-09	ND	3.46E-09
U-234	1.600E-11	3.00E-11		9.80E-04	ND	9.80E-04

See footnotes at end of table

000105

TABLE B.2-2G
(Continued)

Constituent	Dose-Response			Risk-based PRGs based on EPA RAGs Part B[b]		
	Oral CSF[c] $(mg/Kg/day)^{-1}$	External CSF (risk/yr per pCi/m^2)	Oral RfD (mg/Kg/day)	Carcinogens ($TR^e = 10^{-7}$) (mg/kg;pCi/g)	Toxicants ($HI^{d,f} = 0.1$) (mg/Kg;pCi/g)	Screening Value (mg/Kg;pCi/g)
U-235	1.600E-11	2.4E-7		1.23E-07	ND	1.23E-07
U-235/236	1.600E-11	2.4E-7		1.23E-07	ND	1.23E-07
U-236	1.500E-11	2.40E-11		1.23E-03	ND	1.23E-03
U-238	1.600E-11	2.10E-11		1.40E-03	ND	1.40E-03
U-238+2d	2.800E-11	3.6E-8		8.17E-07	ND	8.17E-07

[a]EPA Risk Assessment Guidance, Part B (EPA 1991d).
[b]Exposure time is based on 30 years.
[c]Cancer Slope Factor
[d]Reference Dose
[e]Target Risk
[f]Hazard Index

N/D - no data available, under review

000106

6502

TABLE B.2-2H

TAP WATER RISK-BASED SCREENING LEVELS DEVELOPED FROM EPA RAGS, PART B[a]

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
aluminum					ND	ND	ND
antimony			4.0E-04		ND	1.46E-03	1.46E-03
arsenic	1.75E+00	15.1	3.0E-04		1.46E-07	1.09E-03	1.46E-07
barium			7.0E-02		ND	2.56E-01	2.56E-01
beryllium	4.3E+00	8.4			2.37E-07	ND	2.37E-07
boron			9.0E-02	5.71E-03	ND	3.29E-01	3.29E-01
cadmium		6.3	1.0E-03	6.0E-05	3.60E-07	3.65E-03	3.60E-07
calcium					ND	ND	ND
chromium vi		42	5.0E-03		5.40E-08	1.82E-02	5.40E-08
cobalt			6.0E-02	3.00E-07	ND	2.19E-01	2.19E-01
copper			3.7E-02		ND	1.35E-01	1.35E-01
cyanide			2.0E-02		ND	7.30E-02	7.30E-02
iron					ND	ND	ND
lead					ND	ND	ND
magnesium			9.7E+00		ND	3.54E+01	3.54E+01
manganese			1.4E-01	0.000114	ND	5.11E-01	5.11E-01
mercury			3.0E-04	0.000086	ND	1.10E-03	1.10E-03
molybdenum			5.0E-03		ND	1.82E-02	1.82E-02

See footnotes at end of table

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
nickel		0.84	2.0E-02		2.70E-06	7.30E-02	2.70E-06
potassium					ND	ND	ND
selenium			5.0E-03		ND	1.83E-02	1.83E-02
silicon					ND	ND	ND
silver			5.0E-03		ND	1.82E-02	1.82E-02
sodium					ND	ND	ND
thallium			7.0E-05		ND	2.55E-04	2.55E-04
thorium-total					ND	ND	ND
uranium-total			3.0E-03		ND	1.09E-02	1.09E-02
vanadium			7.0E-03		ND	2.56E-02	2.56E-02
zinc			3.0E-01		ND	1.09E+00	1.09E+00
1,1,1-trichloroethane				0.286	ND	2.78E-01	2.78E-01
1,1,2,2-tetrachloroethane	2.0E-01	0.203			8.84E-06	ND	8.84E-06
1,1,2-trichloroethane	5.7E-02	0.057	4.0E-03		3.14E-05	1.46E-02	3.14E-05
1,1,2-trichlorotrifluoroethane					ND	ND	ND
1,1-dichloroethane			1.0E-01	0.143	ND	1.01E-01	1.01E-01
1,1-dichloroethene	6.1E-01	0.18	9.0E-03		6.61E-06	3.28E-02	6.61E-06
1,2,4-trichlorobenzene			1.0E-02	0.00257	ND	2.34E-03	2.34E-03
1,2-dichloroethane	9.1E-02	0.091			1.97E-05	ND	1.97E-05

See footnotes at end of table

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^{f} = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
1,2-dichloroethene			9.0E-03		ND	3.29E-02	3.29E-02
1,2-dichloropropane		0.068		0.00114	3.33E-05	1.11E-03	3.33E-05
1,2-diethylbenzene					ND	ND	ND
1,4-dichlorobenzene	2.4E-03			0.229	3.54E-04	2.23E-01	3.54E-04
1,4-dioxane					ND	ND	ND
2,4,6-trichlorophenol	1.1E-02	0.011			1.63E-04	ND	1.63E-04
2,4-dichlorophenol			3.0E-03		ND	1.09E-02	1.09E-02
2,4-dinitrophenol			2.0E-03		ND	7.30E-03	7.30E-03
2,4-dinitrotoluene	6.8E-01		2.0E-03		1.25E-05	7.30E-03	1.25E-05
2-butanone			6.0E-01	0.286	ND	2.47E-01	2.47E-01
2,6-dinitrotoluene	6.8E-01		1.0E-03		1.25E-05	3.65E-03	1.25E-05
2-chlorophenol			5.0E-03		ND	1.83E-02	1.83E-02
2-hexanone			4.0E-2		ND	1.46E-01	1.46E-01
2-methylnaphthalene					ND	ND	ND
2-nitroanaline				0.000057	ND	5.56E-05	5.56E-05
2-nitrophenol					ND	ND	ND
3,3-dichlorobenzidene	4.5E-01				1.89E-05	ND	1.89E-05
3-chloropropene					ND	ND	ND
3-nitroanaline			3.0E-03		ND	1.10E-02	1.10E-02

See footnotes at end of table

000109

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
4-chloro-3-methylphenol					ND	ND	ND
4-methyl-2-pentanone			5.0E-02	0.0229	ND	1.99E-02	1.99E-02
4-methylphenol	4.0E+00		5.0E-03		2.12E-06	1.82E-02	2.12E-06
4-nitrophenol				0.06	ND	5.84E-02	5.84E-02
acetone			1.0E-01		ND	3.65E-01	3.65E-01
acetonitrile			6.0E-03	0.05	ND	1.51E-02	1.51E-02
acrylonitrile	5.4E-01	0.238		0.000571	5.93E-06	5.56E-04	5.93E-06
benzene	2.9E-02	0.0292			6.14E-05	ND	6.14E-05
benzoic acid			4.0E+00		ND	1.46E+01	1.46E+01
butyl benzyl phthalate			2.0E-01		ND	7.30E-01	7.30E-01
bis(2-ethylhexyl)phthalate	1.4E-02		2.0E-02		6.07E-04	7.30E-02	6.07E-04
bromodichloromethane	6.2E-02		2.0E-02		1.37E-04	7.30E-02	1.37E-04
bromoform	7.9E-03	0.0039	2.0E-02		3.77E-04	7.30E-02	3.77E-04
bromomethane			2.0E-03	0.00143	ND	1.09E-03	1.09E-03
carbazole	2.0E-02				4.25E-04	ND	4.25E-04
carbon disulfide			1.0E-01	0.00286	ND	2.76E-03	2.76E-03
carbon tetrachloride	1.31E-01	0.053	7.0E-04		2.58E-05	2.56E-03	2.58E-05
chlorobenzene			2.0E-02	0.00571	ND	5.16E-03	5.16E-03
chloroform	6.1E-03	0.0805	1.0E-02		2.76E-05	3.65E-02	2.76E-05

See footnotes at end of table

000210

6502

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
chloromethane	1.3E-02	0.0063			2.32E-04	ND	2.32E-04
chrysene	7.3E-03	0.0061			2.82E-04	ND	2.82E-04
dibromochloromethane	8.4E-02		2.0E-02		1.01E-04	7.30E-02	1.01E-04
dichlorofluoromethane				14.3	ND	1.39E+01	1.39E+01
diethyl phthalate			8.0E-01		ND	2.92E+00	2.92E+00
dimethyl phthalate			1.0E+00		ND	3.65E+00	3.65E+00
di-n-butyl phthalate			1.0E-01		ND	3.65E-01	3.65E-01
di-n-octyl phthalate			2.0E-02		ND	7.30E-02	7.30E-02
ethylbenzene			1.0E-01	0.286	ND	1.58E-01	1.58E-01
hexachlorobenzene	1.6E+00	1.6	8.0E-04		1.12E-06	2.92E-03	1.12E-06
hexachloroethane	1.4E-02	0.014	1.0E-03		1.28E-04	3.65E-03	1.28E-04
hexane			6.0E-02		ND	2.19E-01	2.19E-01
iodomethane					ND	ND	ND
isophorone	4.1E-03		2.0E+00		2.07E-03	7.30E+00	2.07E-03
methylene chloride	7.5E-03	0.00165	6.1E-02	0.857	6.21E-04	1.76E-01	6.21E-04
naphthalene			4.0E-02		ND	1.46E-01	1.46E-01
n-nitrosodiphenylamine	4.9E-03				1.73E-03	ND	1.73E-03
n-nitrosodipropylamine	7.0E+00				1.21E-06	ND	1.21E-06
pentachlorophenol	1.2E-01		3.0E-02		7.08E-05	1.10E-01	7.08E-05

See footnotes at end of table

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^{f} = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
phenol			6.0E-01		ND	2.19E+00	2.19E+00
pyrene			0.003		ND	1.10E-02	1.10E-02
pyridine			0.01		ND	3.65E-02	3.65E-02
styrene	3.0E-02		2.0E-01	0.286	2.83E-04	2.02E-01	2.83E-04
tetrachloroethene	5.2E-02	0.002	1.0E-02		1.43E-04	3.65E-02	1.43E-04
tetrachloroethylene	5.2E-02	0.002	1.0E-02		1.43E-04	3.65E-02	1.43E-04
toluene			2.0E-01	0.114	ND	9.63E-02	9.63E-02
tributyl phosphate			5.0E-03		ND	1.83E-02	1.83E-02
trichloroethene	1.1E-02	0.006			2.54E-04	ND	2.54E-04
trichlorofluoromethane			3.0E-01	0.2	ND	1.65E-01	1.65E-01
vinyl acetate			1.0E+00	0.0571	ND	5.47E-02	5.47E-02
vinyl chloride	1.9E+00	0.3			2.81E-06	ND	2.81E-06
xylenes, total			2.0E+00	0.0857	ND	8.25E-02	8.25E-02
acenaphthene			6.0E-02		ND	2.19E-01	2.19E-01
acenaphthylene			6.0E-02		ND	2.19E-01	2.19E-01
anthracene			3.0E-01		ND	1.10E+00	1.10E+00
benzo(g,h,i)perylene					ND	ND	ND
dibenzofuran			4.0E-03		ND	1.46E-02	1.46E-02
fluoranthene			4.0E-02		ND	1.46E-01	1.46E-01

See footnotes at end of table

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
fluorene			4.0E-02		ND	1.46E-01	1.46E-01
phenanthrene					ND	ND	ND
benzo(a)anthracene	7.3E-01	0.61			2.82E-06	ND	2.82E-06
benzo(a)pyrene	7.3E+00	6.1			2.82E-07	ND	2.82E-07
benzo(b)fluoranthene	7.3E-01	0.61			2.82E-06	ND	2.82E-06
benzo(k)fluoranthene	7.3E-02	0.061			2.82E-05	ND	2.82E-05
chrysene	7.3E-03	0.0061			2.82E-04	ND	2.82E-04
dibenzo(a,h)anthracene	7.3E+00	6.1			2.82E-07	ND	2.82E-07
indeno(1,2,3-cd)pyrene	7.3E-01	0.61			2.82E-06	ND	2.82E-06
4,4-ddd	2.4E-01				3.54E-05	ND	3.54E-05
4,4-dde	3.4E-01				2.50E-05	ND	2.50E-05
4,4-ddt	3.4E-01	0.34	5.0E-04		5.26E-06	1.83E-03	5.26E-06
aldrin	1.7E+01	17	3.0E-05		1.05E-07	1.10E-04	1.05E-07
alpha bhc	6.3E+00	6.3			2.84E-07	ND	2.84E-07
aroclor-1248	7.7E+00				1.10E-06	ND	1.10E-06
aroclor-1254	7.7E+00				1.10E-06	ND	1.10E-06
aroclor-1260	7.7E+00				1.10E-06	ND	1.10E-06
alpha-chlorodane	1.3E+00	1.3	6.0E-05		1.38E-06	2.19E-04	1.38E-06
beta bhc	1.8E+00	1.8			9.94E-07	ND	9.94E-07

See footnotes at end of table

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TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^{f} = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
gamma-chlorodane	1.3E+00	1.3	6.0E-05		1.38E-06	2.19E-04	1.38E-06
chlorodane	1.3E+00	1.3	6.0E-05		1.38E-06	2.19E-04	1.38E-06
delta bhc					ND	ND	ND
diazinon			9.0E-04		ND	3.28E-03	3.28E-03
dieldrin	1.6E+01	16	5.0E-05		1.12E-07	1.83E-04	1.12E-07
endosulfan I			6.0E-03		ND	2.19E-02	2.19E-02
endosulfan II			5.0E-05		ND	1.83E-04	1.83E-04
endrin			3.0E-04		ND	1.09E-03	1.09E-03
Endrin ketone			3.0E-04		ND	1.24E-03	1.24E-03
gamma chlorodane					ND	ND	ND
heptachlor	4.5E+00	4.5	5.0E-04		3.98E-07	1.83E-03	3.98E-07
heptachlor epoxide	9.1E+00	9.1	1.0E-05		1.97E-07	4.75E-05	1.97E-07
lindane			3.0E-04		ND	1.10E-03	1.10E-03
malathion			2.0E-02		ND	7.30E-02	7.30E-02
methoxychlor			5.0E-03		ND	1.83E-02	1.83E-02
toxaphene	1.1E+00	1.1			1.63E-06	ND	1.63E-06
heptachlorodibenzofuran	1.5E+03	1500			1.19E-09	ND	1.19E-09
heptachlorodibenzo-p-dioxin	1.5E+03	1500			1.19E-09	ND	1.19E-09
hexachlorodibenzofuran	1.5E+04	15000			1.19E-10	ND	1.19E-10

See footnotes at end of table

TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
hexachlorodibenzo-p-dioxin	1.5E+04	15000			1.19E-10	ND	1.19E-10
octachlorodibenzofuran	1.5E+02	150			1.19E-08	ND	1.19E-08
octachlorodibenzo-p-dioxin	1.5E+02	150			1.19E-08	ND	1.19E-08
pentachlorodibenzofuran	7.5E+03	7500			2.39E-10	ND	2.39E-10
tetrachlorodibenzofuran	1.5E+04	15000			1.19E-10	ND	1.19E-10
tetrachlorodibenzo-p-dioxin	1.5E+05	150000			1.19E-11	ND	1.19E-11
ammonia				0.0286	ND	2.78E-02	2.78E-02
chloride					ND	ND	ND
fluoride			6.0E-02		ND	2.19E-01	2.19E-01
nitrate			1.6E+00		ND	5.84E+00	5.84E+00
nitrite			1.0E-01		ND	3.65E-01	3.65E-01
sulfate					ND	ND	ND
Cs-137+1d	2.8E-11	1.90E-11			1.70E-01	ND	1.70E-01
Np-237+1d	2.20E-10	2.90E-08			2.16E-02	ND	2.16E-02
Pb-210+2d	6.60E-10	4.00E-09			7.20E-03	ND	7.20E-03
Pu-238	2.20E-10	3.90E-08			2.16E-02	ND	2.16E-02
Pu-239/240	2.30E-10	3.80E-08			2.07E-02	ND	2.07E-02
Ra-224	3.80E-11	1.20E-09			1.25E-01	ND	1.25E-01
Ra-226+8d	7.80E-10	7.00E-09			1.76E-04	ND	1.76E-04

See footnotes at end of table

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TABLE B.2-2H
(Continued)

Constituent	Dose-Response				Risk-based PRGs based on EPA RAGs Part B[c]		
	Oral CSF[d] $(mg/Kg/day)^{-1}$	Inhalation CSF[b] $(mg/Kg/day)^{-1}$	Oral RfD (mg/Kg/day)	Inhalation[b] RfD (mg/Kg/day)	Carcinogens ($TR^f = 10^{-7}$) (mg/L;pCi/L)	Toxicants ($HI^{e,g} = 0.1$) (mg/L;pCi/L)	Screening Value (mg/L;pCi/L)
Ra-228+1d	1.00E-10	6.90E-10			4.75E-02	ND	4.75E-02
Ru-106	9.50E-12	4.40E-10			5.00E-01	ND	5.00E-01
Sr-90+1d	3.60E-11	6.20E-11			1.32E-01	ND	1.32E-01
Tc-99	1.30E-12	8.30E-12			3.65E+00	ND	3.65E+00
Th-228+7d	5.50E-11	7.80E-08			8.64E-02	ND	8.64E-02
Th-230	1.30E-11	2.90E-08			3.65E-01	ND	3.65E-01
Th-232+10d	1.7E-10	1.10E-07			2.79E-02	ND	2.79E-02
U-234	1.6E-11	2.60E-08			2.97E-01	ND	2.97E-01
U-235	1.6E-11	2.50E-08			2.97E-01	ND	2.97E-01
U-235/236	1.6E-11	2.50E-08			2.97E-01	ND	2.97E-01
U-236	1.5E-11	2.50E-08			3.17E-01	ND	3.17E-01
U-238+2d	2.8E-11	5.20E-08			1.70E-01	ND	1.70E-01

[a]EPA Risk Assessment Guidance, Part B (EPA 1991d).
[b]The inhalation CSFs and RfDs were calculated from unit risk values and reference concentrations taken from IRIS.
[c]Exposure time is based on 30 years.
[d]Cancer Slope Factor
[e]Reference Dose
[f]Target Risk
[g]Hazard Index

N/D - no data available, under review

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The water screening values were compared to groundwater (including perched water) and surface water concentration terms before modeling was performed (see Section B.2.4.2.3).

Constituents which were screened out based on toxicological screening are presented by media and subunit in Table B.2-2I.

B.2.4A.2.3 Surface Water and Groundwater Modeling

The fate and transport modeling requires multi-steps processes. At the end of each major step within the modeling process, predicted surface water and groundwater concentrations were compared to the EPA RAGs, Part B screening values for water. If the predicted constituent concentration was below the water screening value, then it was removed from the CPC list. Below is a discussion of screening process used to determining surface water and groundwater CPCs.

Surface Water Modeling

Surface water modeling was used to predict on-subunit runoff concentration during a 24-hour storm event based on the surface soil concentrations. On-subunit runoff concentrations were compared against EPA RAGs, Part B screening values for water (Figure B.2-3B). If the on-subunit runoff water concentration for a constituent was below the water screening value, then that constituent was removed from the CPC list for the surface water as well as a potential CPC for groundwater from the surface water pathway. For the remaining CPCs, concentrations in the Great Miami River were predicted.

Groundwater Modeling

The Great Miami Aquifer can be impacted by a subunit through various pathways (See Appendix A-2). For the surface water pathways, loading to the Great Miami Aquifer from the surface water infiltration was determined and then predicted Great Miami Aquifer concentration were compared against the water screening values (Figure B.2-3B). If predicted Great Miami Aquifer concentration was below the water screening value, then the constituent was removed from the CPC list.

For subsurface soils and perched water as a source of loading to the Great Miami Aquifer, the output from the vadose zone model was screened against the water screening concentrations (Figure B.2-3C). To perform this screening, the maximum output from the vadose zone model for a particular

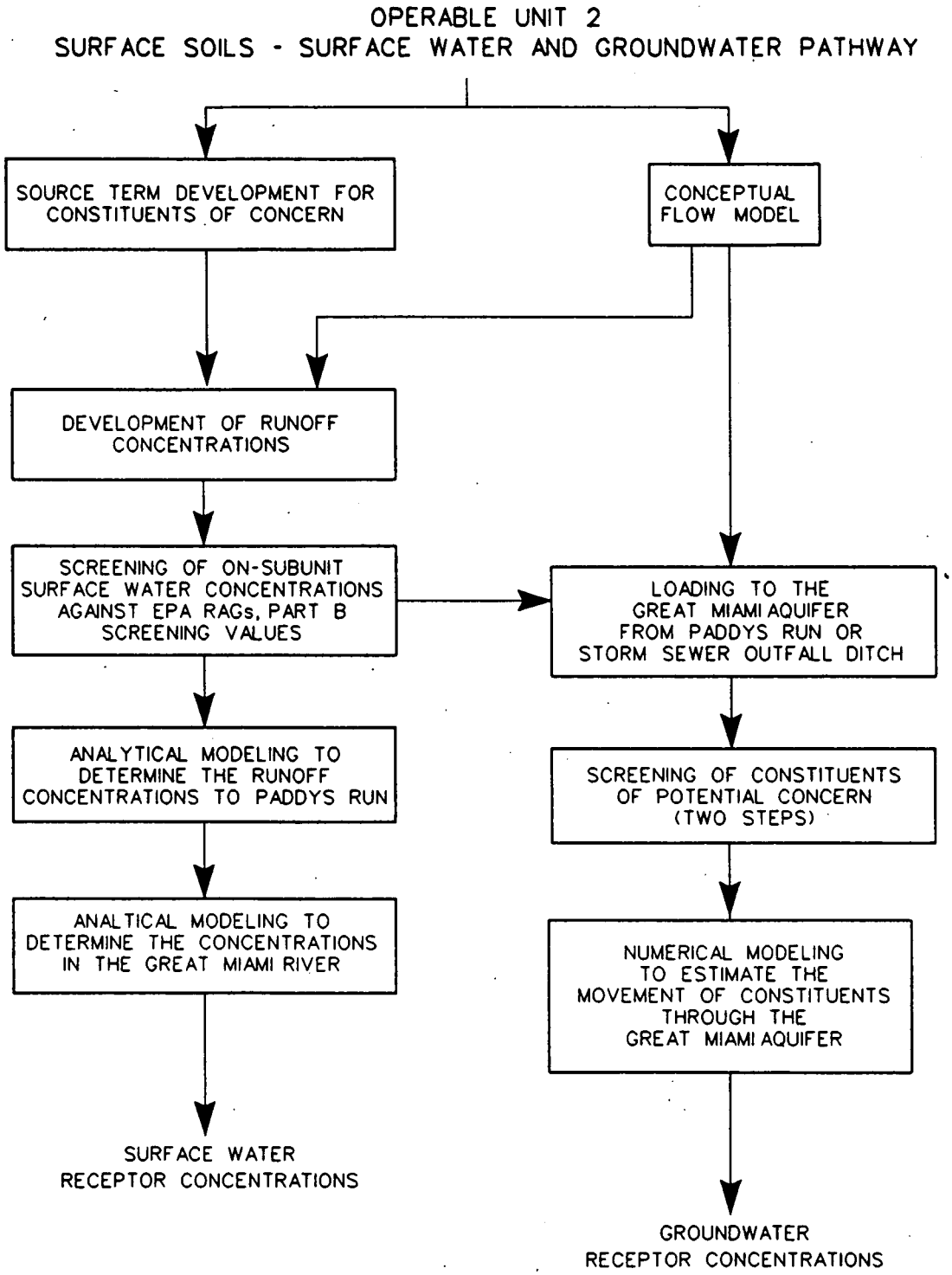

FIGURE B.2-3B
SURFACE WATER TRANSPORT MODELING DIAGRAM

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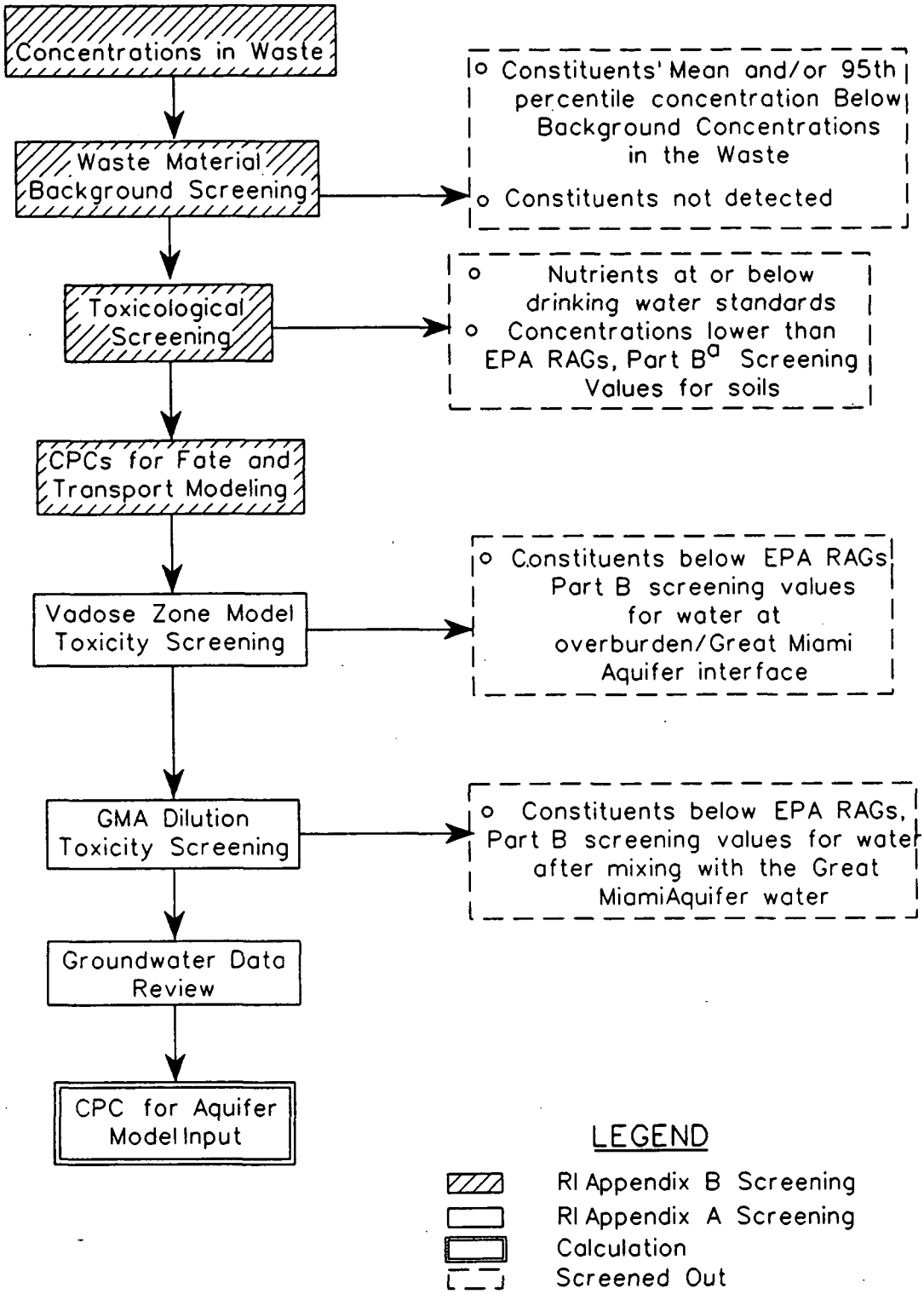

[a] EPA Risk Assessment Guidence, Part B (EPA, 1991d).

figa0108.dgn

FIGURE B.2-3C
POTENTIAL CONSTITUENT OF CONCERN SCREENING DIAGRAM

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TABLE B.2-2I

CONSTITUENTS ELIMINATED BASED ON SECONDARY (EPA RAGS, PART B) TOXICOLOGICAL SCREENING[a]

Surface Soil	Subsurface Soil
ACTIVE FLYASH PILE	
Antimony	Antimony
Barium	Barium
Cadmium	Cadmium
Chromium	Chromium
Cobalt	Cobalt
Cooper	Copper
Mercury	Cyanide
Molybdenum	Mercury
Nickel	Molybdenum
Selenium	Nickel
Silver	Selenium
Vanadium	Vanadium
Zinc	Zinc
Uranium-total	Uranium-total
	Benzoic acid
	Di-n-butyl phthalate
	Di-n-octyl phthalate
	Naphthalene
	Pentachlorophenol
	Phenol
	Bis(2-Ethylhexyl)phthalate
	1,1,1-trichloroethane
	2-butanone
	2-methyl-2-pentanone
	Acetone
	Carbon disulfide
	Chloromethane
	Methylene chloride
	Toluene
SOUTH FIELD	
Antimony	Barium
Barium	Cadmium
Chromium	Chromium
Copper	Copper
Cyanide	Cyanide

TABLE B.2-2I
(Continued)

Surface Soil	Subsurface Soil
SOUTH FIELD (Continued)	
Manganese	Mercury
Molybdenum	Molybdenum
Nickel	Silver
Selenium	Vanadium
Silver	4-methylphenol
Vanadium	Acenaphthalene
Zinc	Anthracene
Uranium-total	Benzo(g,h,i)perylene
Endrin ketone	Benzo(k)fluoranthene
Acenapthene	Benzoic acid
Acenaphthylene	Carbazole
Anthracene	Chrysene
Benzoic acid	Di-n-butyl phthalate
Carbazole	Di-n-octyl phthalate
Chrysene	Dibenzo(a,h)anthracene
Dibenzofuran	Diethyl phthalate
Dimethyl phthalate	Fluoranthene
Fluoranthene	Indeno(1,2,3-cd)pyrene
Fluorene	Isophorone
Pyrene	Naphthalene
Bis(2-Ethylhexyl)phthalate	Phenol
Acetone	Pyrene
Methylene chloride	Bis(2-Ethylhexyl)phthalate
	1,1,1-trichloroethane
	2-butanone
	2-hexanone
	2-methyl-2-pentanone
	Acetone
	Carbon disulfide
	Chlorobenzene
	Chloroform
	Chloromethane
	Methylene chloride
	Styrene
	Tetrachloroethane
	Toluene
	Trichloroethane
	Vinyl acetate

TABLE B.2-2I
(Continued)

Surface Soil	Subsurface Soil
SOUTH FIELD (Continued)	
	Xylenes total
	Endrin ketone
	Alpha-chlordane
	Gamma-chlordane
INACTIVE FLYASH PILE	
Barium	Barium
Cadmium	Cadmium
Copper	Chromium
Cyanide	Copper
Magnesium	Cyanide
Molybdenum	Mercury
Selenium	Molybdenum
Silver	Silver
Vanadium	Vanadium
Uranium-total	4-methylphenol
Acenaphthalene	Acenaphthalene
Acenaphthylene	Anthracene
Anthracene	Benzo(g,h,i)perylene
Carbazole	Benzo(k)fluoranthene
Dibenzofuran	Benzoic acid
Naphthalene	Carbazole
2-butanone	Chrysene
Acetone	Di-n-butyl phthalate
Toluene	Di-n-octyl phthalate
	Dibenzo(a,h)anthracene
	Diethyl phthalate
	Fluoranthene
	Indeno(1,2,3-cd)pyrene
	Isophorone
	Naphthalene
	Phenol
	Pyrene
	Bis(2-Ethylhexyl)phthalate
	1,1,1-trichloroethane
	2-butanone
	2-hexanone
	2-methyl-2-pentanone

TABLE B.2-2I
(Continued)

Surface Soil	Subsurface Soil
INACTIVE FLYASH PILE (Continued)	
	Acetone
	Carbon disulfide
	Chlorobenzene
	Chloroform
	Chloromethane
	Methylene chloride
	Styrene
	Tetrachloroethane
	Toluene
	Trichloroethane
	Vinyl acetate
	Xylenes total
	Endrin ketone
	Alpha-chlordane
	Gamma-chlordane
SOLID WASTE LANDFILL	
Barium	Barium
Chromium	Cadmium
Copper	Chromium
Molybdenum	Copper
Nickel	Cyanide
Selenium	Mercury
Silver	Molybdenum
Vanadium	Nickel
Zinc	Selenium
Uranium-total	Thallium
Acenaphthene	Vanadium
Anthracene	Uranium-total
Benzo(f)fluoranthene	2-chlorophenol
Bis(2-Ethylhexyl)phthalate	Acenaphthalene
Carbazole	Anthracene
Chrysene	Benzo(f)fluoranthene
Di-n-butyl phthalate	Chrysene
Dibenzofuran	Di-n-butyl phthalate
Fluoranthene	Di-n-octyl phthalate
Fluorene	Dibenzofuran
Pyrene	Diethyl phthalate

TABLE B.2-2I
(Continued)

Surface Soil	Subsurface Soil
SOLID WASTE LANDFILL (Continued)	
2-butanone	Fluoranthene
Acetone	Fluorene
Bromomethane	Naphthalene
Chloromethane	Phenol
Di-n-butyl phthalate	Pyrene
Bis(2-Ethylhexyl)phthalate	Bis(2-Ethylhexyl)phthalate
	Di-n-butyl phthalate
	Diethyl phthalate
	1,1-dichloroethane
	1,2-dichloroethane
	1,2-dichloroethene
	2-butanone
	2-hexanone
	4-methyl-2-pentanone
	Acetone
	Benzene
	Chlorobenzene
	Chloromethane
	Ethylbenzene
	Methylene chloride
	Tetrachloroethane
	Toluene
	Xylenes, total
	4,4'-DDD
	Endrin ketone
LIME SLUDGE PONDS	
Barium	Antimony
Cadmium	Barium
Chromium	Boron
Copper	Cadmium
Cyanide	Chromium
Mercury	Cobalt
Molybdenum	Copper
Nickel	Cyanide
Zinc	Manganese
Anthracene	Mercury
Benzo(k)fluoranthene	Molybdenum
Carbazole	Nickel

TABLE B.2-2I
(Continued)

Surface Soil	Subsurface Soil
LIME SLUDGE PONDS (Continued)	
Chrysene	Selenium
Di-n-butyl phthalate	Silver
di-n-octyl phthalate	Thallium
dibenzofuran	Vanadium
fluoranthene	Zinc
pyrene	Uranium-total
acetone	Anthracene
toluene	Benzo(a)anthracene
	Benzo(k)fluoranthene
	Chrysene
	Di-n-butyl phthalate
	Di-n-octyl phthalate
	Fluoranthene
	Pyrene
	Bis(2-Ethylhexyl)phalate
	2-hexanone
	Acetone
	Acetonitrile
	Hexane
	Methylene chloride
	Toluene

[a]Concentrations and RAGs PRGs are located in Attachment B.III [Tables B.3-1-2(a), B.3.2-2(a), B.3.3-2(a), B.3.4-2(a), and B.3.5-2(a)].

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constituent was compared with the water screening concentrations. If this maximum value (from all grid blocks) was below the screening concentration, then the constituent was screened out and was not modeled further. CPCs passing the vadose zone model toxicity screening were further screened by predicting dilution in the Great Miami Aquifer. If the predicted Great Miami Aquifer concentration was below the screening concentration, then the constituent was screened out and was not modeled further. Details of these steps are provided in Appendix A-2.

B.2.4A.2.4 Results of Selecting CPCs

The screening procedure employed served as a selection criterion for retaining detected constituents for further quantitative evaluation as CPCs in this baseline risk assessment. A constituent was retained as a CPC if: 1) their concentration term exceeded corresponding background concentrations, 2) it did not meet the initial toxicological screening criteria, and 3) their concentration term exceeded corresponding screening values. Tables B.2-2J through B.2-2N present the final CPCs by subunit for each media.

B.2.4 EXPOSURE ASSESSMENT

The exposure assessment was the determination of the magnitude of contact that a potential receptor may have with site-related CPC. The general procedure for conducting an exposure assessment involves the following three steps: 1) characterization of the physical setting, 2) identification of exposure pathways, and 3) quantification of exposure.

In the first step, the general physical characteristics of the site and characteristics of potential receptor populations are described. This information was presented in Section B.2.1. In the second step, the predominant constituent migration and exposure pathways are identified. Pathways are identified on the basis of the source characteristics; known and potential releases; environmental fate of chemical and radioactive constituents; and locations and activities of potentially exposed populations. Section B.2.2 summarizes this information for Operable Unit 2.

The third step, quantification of exposures, involves calculation of estimated intake of contaminants, in mg/kg-day for chemicals and pCi for radionuclides, for each identified receptor. This information is summarized in this section.

TABLE B.2-2J

ACTIVE FLYASH PILE
OPERABLE UNIT 2 CONTAMINANTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Groundwater (GMA)
arsenic	arsenic	arsenic	arsenic	arsenic
beryllium	beryllium		berylium	berylium
lead	lead		neptunium-237	lead
thallium	thallium		plutonium-238	molybdenum
cesium-137	neptunium-237		plutonium-239/240	neptunium-237
neptunium-237	lead-210		radium-226	strontium-90
plutonium-238	plutonium-238		radium-228	uranium-234
plutonium-239/240	plutonium-239/240		strontium-90	uranium-235/236
radium-226	radium-224		uranium-234	uranium-238
radium-228	radium-226		uranium-235/236	uranium-total
strontium-90	radium-228		uranium-238	2-methylnaphthalene
thorium-228	strontium-90			
thorium-230	thorium-228			
thorium-232	thorium-230			
thorium-total	thorium-232			
uranium-234	thorium-total			
uranium-235/236	uranium-234			
uranium-238	uranium-235			
	uranium-235/236			
	uranium-238			
	2-methylnaphthalene			
	phenanthrene			

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TABLE B.2-2K

SOUTH FIELD
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Groundwater (GMA)
arsenic	arsenic	arsenic	arsenic	arsenic
beryllium	beryllium	lead	beryllium	lead
lead	lead	uranium-234	lead	neptunium-237
cesium-137	cesium-137	uranium-235/236	nickel	radium-226
neptunium-237	neptunium-237	uranium-238	neptunium-237	strontium-90
plutonium-238	lead-210	uranium-total	plutonium-238	technetium-99
plutonium-239/240	plutonium-238	neptanium-237	radium-226	uranium-234
radium-226	plutonium-239/240	radium-226	radium-228	uranium-235/236
radium-228	radium-224	technetium-99	strantium-90	uranium-238
strontium-90	radium-226	2-methylnaphthalene	technetium-99	uranium-total
technetium-99	radium-228	benzo(a)pyrene	uranium-234	2-methylnaphthalene
thorium-228	ruthenium-106	phenanthrene	uranium-235/236	benzo(g,h,i)perylene
thorium-230	thorium-228	tributyl phosphate	uranium-238	phenanthrene
thorium-232	thorium-230		uranium-total	tributyl phosphate
thorium-total	thorium-232		benzo(a)anthracene	
uranium-234	thorium-total		benzo(a)pyrene	
uranium-235/236	uranium-234		benzo(b)fluoranthene	
uranium-238	uranium-235		benzo(g,h,i)perylene	
Aroclor-1254	uranium-235/236		bis(2-ethylhexyl)phthalate	
Aroclor-1260	uranium-238		dibenzo(a,h)anthracene	
dieldrin	uranium-total		dieldrin	
benzo(a)anthracene	2-methylnaphthalene		phenanthrene	
benzo(a)pyrene	benzo(a)anthracene			
benzo(b)fluoranthene	benzo(a)pyrene			
benzo(g,h,i)perylene	benzo(b)fluoranthene			
benzo(k)fluoranthene	benzo(g,h,i)perylene			
dibenzo(a,h)anthracene	phenanthrene			
indeno(1,2,3-cd)pyrene	tributyl phosphate			
phenanthrene	octachlo-odibenzo-p-dioxin			
	tetrachlorodibenzofuran			
	Aroclor-1254			
	Aroclor-1260			
	dieldrin			

TABLE B.2-2L

INACTIVE FLYASH PILE
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Groundwater (GMA)
arsenic	arsenic	arsenic	plutonium-239/240	neptunium-237
beryllium	beryllium	berylium	strontium-90	radium-226
lead	lead	cadmium	uranium-234	strontium-90
neptunium-237	cesium-137	lead	uranium-235/236	technetium-99
plutonium-238	neptunium-237	nickel	uranium-238	uranium-234
plutonium-239/240	lead-210	neptunium-237	uranium-total	uranium-235/236
radium-226	plutonium-238	plutonium-238	arsenic	uranium-238
radium-228	plutonium-239/240	plutonium-239/240	berylium	uranium-total
strontium-90	radium-224	radium-226	dibenzo(a,h)anthracene	lead
thorium-228	radium-226	radium-228	neptunium-237	arsenic
thorium-230	radium-228	strontium-90	plutonium-238	2-methylnaphthalene
thorium-232	ruthenium-106	uranium-234	radium-226	benzo(g,h,i)perylene
thorium-total	thorium-228	uranium-235/236	radium-228	phenanthrene
uranium-234	thorium-230	uranium-238		tributyl phosphate
uranium-235/236	thorium-232	uranium-total		
uranium-238	thorium-total	2-methylnaphthalene		
2-methylnaphthalene	uranium-234			
dibenzo(a,h)anthracene	uranium-235			
	uranium-235/236			
	uranium-238			
	uranium-total			
	2-methylnaphthalene			
	benzo(a)anthracene			
	benzo(a)pyrene			
	benzo(b)fluoranthene			
	benzo(g,h,i)perylene			
	phenanthrene			
	tributyl phosphate			
	octachlorodibenzo-p-dioxin			
	tetrachlorodibenzofuran			
	Aroclor-1254			
	Aroclor-1260			
	dieldrin			

TABLE B.2-2M

SOLID WASTE LANDFILL
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Perched Water	Groundwater (GMA)
arsenic	antimony	arsenic	neptunium-237	technetium-99	technetium-99
beryllium	arsenic	beryllium	arsenic	carbazole	
lead	beryllium	lead	berylium	2-methylnaphthlene	
neptunium-237	lead	neptunium	radium-226	endosulfan sulfate	
plutonium-238	cesium-137	radium-226	radium-228		
plutonium-239/240	neptunium-237	radium-228	strontium-90		
radium-226	lead-210	strontium-90	uranium-234		
radium-228	plutonium-238	uranium-234	uranium-235/236		
strontium-90	plutonium-239/240	uranium-235/236	uranium-238		
thorium-228	radium-224	uranium-238	uranium-total		
thorium-230	radium-226	uranium-total	benzo(a)anthracene		
thorium-232	radium-228	benzo(g,h,i)peryle	benzo(a)pyrene		
thorium-total	strontium-90	dibenzo(a,h)anthracene	dibenzo(a,h)anthracene		
uranium-234	technetium-99	phenanthrene			
uranium-235/236	thorium-228				
uranium-238	thorium-230				
benzo(a)anthracene	thorium-232				
benzo(a)pyrene	thorium-total				
benzo(b)fluoranthene	uranium-234				
benzo(g,h,i)perylene	uranium-235				
dibenzo(a,h)anthracene	uranium-235/236				
indeno(1,2,3-cd)pyrene	uranium-238				
phenanthrene	uranium-total				
	2-methylnaphthalene				
	benzo(a)anthracene				
	benzo(a)pyrene				

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TABLE B.2-2M
(Continued)

Surface Soil	Subsurface Soil	Surface Water	Sediment	Perched Water	Groundwater (GMA)
	benzo(b)fluoranthene				
	benzo(g,h,i)perylene				
	carbazole				
	dibenzo(a,h)anthracene				
	indeno(1,2,3-cd)pyrene				
	phenanthrene				
	1,4-dioxane				
	heptachlorodibenzo-p-dioxin				
	heptachlorodibenzofuran				
	octachlorodibenzo-p-dioxin				
	Aroclor-1254				
	Aroclor-1260				
	dieldrin				
	endosulfan sulfate				
	endrin aldehyde				

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TABLE B.2-2N

LIME SLUDGE PONDS
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Waste Material	Perched Water	Groundwater (GMA)
arsenic	arsenic	neptunium-237	technetium-99
beryllium	beryllium	strontium-90	
lead	lead	technetium-99	
cesium-137	cesium-137	arsenic	
neptunium-237	neptunium-237	1,1,2-trichlorotrifluoroethane	
plutonium-238	plutonium-238	1,2-diethylbenzene	
plutonium-239/240	plutonium-239/240		
radium-226	radium-226		
radium-228	radium-228		
strontium-90	strontium-90		
thorium-228	technetium-99		
thorium-230	thorium-228		
thorium-232	thorium-230		
thorium-total	thorium-total		
uranium-234	uranium-234		
uranium-235/236	uranium-235/236		
uranium-238	uranium-238		
uranium-total	Aroclor-1254		
Aroclor-1254	benzo(g,h,i)perylene		
benzo(a)anthracene	dibenzo(a,h)anthracene		
benzo(a)pyrene	ideno(1,2,3-cd)pyrene		
benzo(b)fluoranthene	phenanthrene		
benzo(g,h,i)perylene	1,1,2trichlorotriflurorethane		
bis(2-Ethylhexyl)phthalate	1,2-diethylbenzene		
dibenzo(a,h)anathracene	acrylonitrile		
ideno(1,2,3-cd)pyrene			
phenanthrene			

To estimate intake, exposure point concentrations are combined with relevant exposure parameters for each receptor, each environmental medium, and each route of exposure. Receptors, environmental media, and routes of exposure for which intake are quantified in this risk assessment is summarized in Table B.2-2. Derivation of exposure point concentrations is described in Section B.2.4.1, and intake equations are described in Section B.2.4.2.

B.2.4.1 Exposure Point Concentrations

The exposure point concentration is the concentration of a constituent in an environmental medium that may be contacted by a real or hypothetical receptor. It is used in combination with other exposure parameters in intake equations to quantify the actual intake (in mg/kg-day for chemicals and pCi for radionuclides) that a receptor may receive via a specific pathway (e.g., soil, groundwater, etc.) and route of exposure (e.g., ingestion, inhalation, dermal contact).

Exposure point concentrations for Operable Unit 2 are determined in different ways depending on whether exposures are assumed to be current or future, and the environmental medium of interest. To be consistent with the concept of the RME scenario, an estimate of the highest exposure that can reasonably be expected to occur requires a reasonable maximum estimate of the concentration of each constituent in each exposure medium. Because of the uncertainty associated with any estimate of exposure concentrations, the 95 percent UCL on the arithmetic mean for either a normal or lognormal distribution is the recommended statistic (concentration value) to be constructed from measured constituent concentration data and used in risk assessments (EPA 1992c).

B.2.4.1.1 Exposure Point Concentrations for Soil

Exposure point concentrations for direct contact surface soil exposure pathways, under both current and future land use assumptions, are the UCLs determined from surface soil data using the process described in the FEMP guidelines and Section B.2.3 for identifying CPCs.

B.2.4.1.2 Exposure Point Concentrations for Groundwater

Current exposures to groundwater at the FEMP will be addressed as part of the Operable Unit 5 RI. Exposure to potential future concentrations of contaminants in groundwater from each operable unit are addressed during each operable unit RI baseline risk assessment. Future exposure point concentrations for groundwater are determined from the results of geochemical and groundwater transport modeling, as illustrated schematically in Figure B.2-5 and as described in detail in

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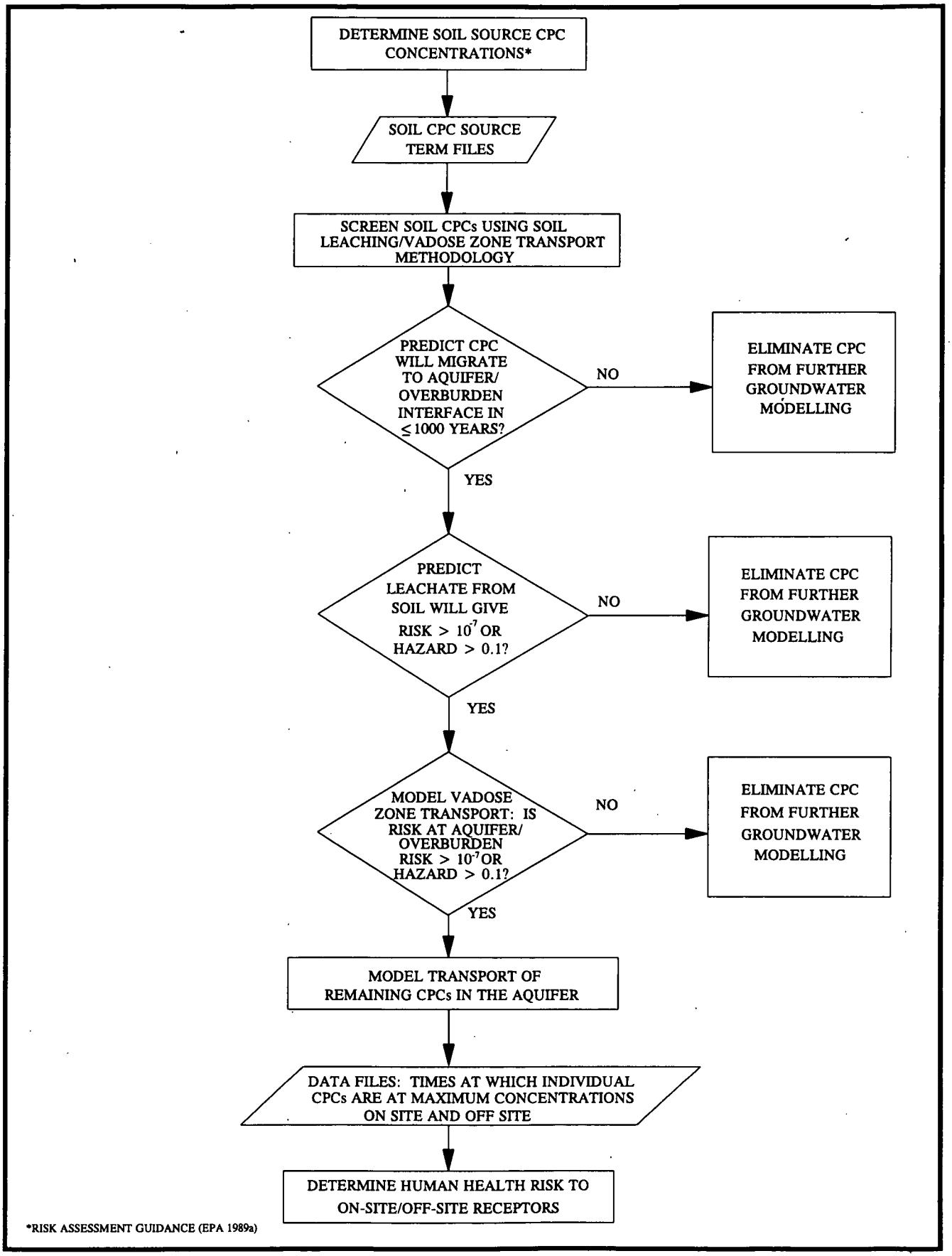

FIGURE B.2-5. RISK ASSESSMENT AND GROUNDWATER MODELLING

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Section 5.0 of this RI report. For assessment of exposures to constituents migrating from the South Field and Inactive Flyash Pile to groundwater, a single source term was derived from soil data of both subunits. For assessment of exposures to contaminants migrating from the Active Flyash Pile, Solid Waste Landfill, and Lime Sludge Ponds, independent source terms were derived.

Potential constituent concentrations in leachate seeping from the waste area and from the underlying soils were modeled with the geochemical model described in Section 5.0 and Appendix A of this RI report. Leachate concentrations were then modeled through the vadose zone to the regional aquifer to yield the calculated future concentrations in the aquifer directly underlying the waste area. As illustrated in Figure B.2-5, CPC soil source concentrations are used in predictive modeling based upon potential leaching of CPCs from soil. CPCs estimated to be present in leachate which are not screened out (i.e., which are present in leachate at levels exceeding a level associated with an acceptable risk/hazard level) are further subjected to vadose zone transport modeling to predict which CPCs might reach the aquifer/overburden interface in 1000 years or less. Concentrations of constituents predicted to reach the aquifer/overburden interface are then compared again to acceptable risk levels; and those present at concentrations exceeding acceptable risk levels are carried through the quantitative risk assessment. Screening values against which leachate concentrations are compared were derived from screening criteria generated by EPA Risk Assessment Guidance for Superfund, Part B (EPA 1989b) using an incremental lifetime cancer risk (ILCR) of 1×10^{-7} and a HI of 0.1. The screening value for each carcinogen is the concentration of the CPC that would yield a lifetime cancer risk of 1×10^{-7} if the leachate were ingested at a rate of 2 L/day for 70 years. For non-carcinogens, the screening level is the concentration reaching the regional aquifer that would yield an intake resulting in a hazard index of 0.1. These levels ensure that any chemical that could contribute significantly to the calculated risk will be retained and modeled. The remaining CPCs not screened any further by the aquifer transport modeling, are described below. The approach of screening CPCs that are conservatively estimated to reach the aquifer provides the necessary and sufficient confidence that risks are not being overlooked while optimizing against the resource and computer requirements of running a three-dimensional groundwater transport code.

Off-property concentrations of CPCs in groundwater are calculated using the regional aquifer model, SWIFT III (Geotrans 1987). CPCs retained after leachate/vadose zone modeling were modeled using SWIFT III. The maximum calculated concentrations in the aquifer on site and at the fenceline were used for exposure point concentrations for on-site and off-site future groundwater exposures,

respectively. Details of the model and parameters used to calculate future aquifer concentrations are presented in Section 5.0 and Appendix A of this RI report. The locations of calculated maximum off-site concentrations of constituents transported from the waste areas of Operable Unit 2 via groundwater also are shown in Section 5.0 and Appendix A of this RI report.

B.2.4.1.3 Exposure Point Concentrations for Surface Water and Sediment

Like groundwater, exposures to current concentrations in surface water and sediment outside the boundary of Operable Unit 2 waste areas are to be addressed in the Operable Unit 5 RI. Current exposures to surface water and sediment within each subunit were estimated where applicable using the UCL concentrations for each CPC. For future exposures to surface water in Paddys Run and the Great Miami River, fate and transport modeling was used to determine exposure point concentrations. Surface water CPCs included all CPCs selected for surface soil within each subunit. The Modified Universal Soil Loss Equation (MUSLE), a commonly used soil loading model (EPA 1988c), was used to determine if soil runoff, and hence sorbed constituent runoff, would contribute significantly to constituent concentrations in Paddys Run and consequently in the Great Miami River. The source term for this model is the 95 percent UCL surface soil concentrations. Refer to Appendix A, Section A.1 for a detailed discussion of contaminant loading to surface water from Operable Unit 2 contaminants.

B.2.4.1.4 Exposure Point Concentrations for Air

Airborne concentrations of constituents from the individual waste areas of Operable Unit 2 have been modeled for both current and future conditions at on-subunit, on-site, and off-site locations. The model used assumed mass loading (fugitive dust emissions) of surface soil to the air from each waste area and subsequent transport and dispersion of constituents. The model and parameters for air dispersion are described in Section 5.0 and Appendix A of this RI report. Figure B.2-6 illustrates that the initial source term for air modeling is the 95 percent UCL soil concentration (surface soil except homebuilder scenario that uses subsurface). The results of air model provide the highest annual average air concentrations and deposition rates at each of the specified locations (on-subunit, on-property, off-property). This allows for calculation of exposures to constituents being released to air and exposures resulting from ingestion of vegetation on which air particles are deposited.

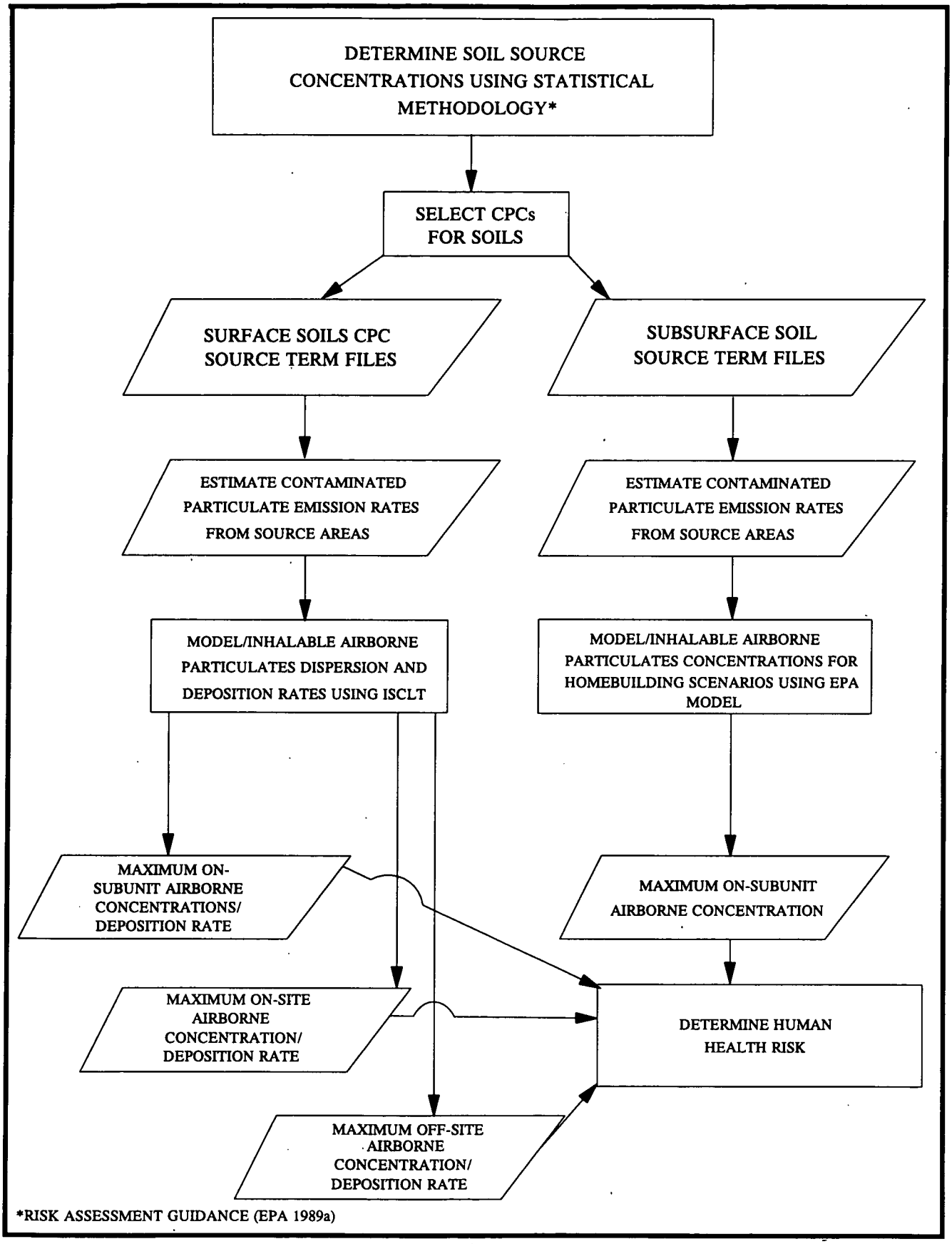

FIGURE B.2-6. RISK ASSESSMENT AND AIR MODELLING

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B.2.4.1.5 Radon Exposure Point Concentrations

Exposure point concentrations for estimating risk to receptors due to radon-222 inhalation were estimated using the RAECOM model algorithms developed for the NRC (NRC 1984) which converts radium-226 concentrations (in pCi/g) to radon-222 fluxes (in pCi/s-m^2). The basic equations are presented in the Risk Assessment Work Plan Addendum. Total emissions of radon-222 were calculated for surface and subsurface soil in each subunit from the radium-226 concentrations in contaminated soil or waste within that subunit.

The OU2-wide assessment considers three future receptors, the expanded trespasser, off-property resident farmer. The OU2-wide expanded trespasser differs from the individual subunit expanded trespasser in that he is considered to wander between all of the subunits. An area weighted average approach was used to establish his exposures. the on-property RME farmer is considered to live on the South Field. the only additional exposure that the OU2-wide RME farmer gets above the South Field RME farmer are cumulative air and groundwater concentrations from all five subunits. The off-property farmer also receives an exposure to the cumulative air and groundwater concentrations.

B.2.4.2 Intake Equations

The equations and parameter values used in estimating intake are summarized in this section. Tables B.2-3A and B.2-3B presents the parameter values used in these equations to estimate potential exposures for current land use receptors. Tables B.2-4A and B.2-4B presents the parameter values used in these equations to estimate potential exposures for future land use receptors. Parameter values which remain the same from pathway to pathway are provided at the beginning of the table, except where noted.

B.2.4.2.1 Incidental Ingestion of Soil

The estimation of intake of constituents in soils is determined by using the 95 percent UCL concentration in the soil within each subunit. Evaluation of the soil ingestion pathway is performed for adults and children. For variables that are common to both chemical and radionuclide intake equations, units for the radionuclide equations are listed first. The equations used to quantify intake (EPA 1989a) are:

$$(\text{radionuclides})I_s = (C_s)(CF)(IR)(ED)(EF)(FI) \quad \text{(B.2-8)}$$

$$(\text{chemicals})I_s = (C_s)(IR)(CF)(FI)(EF)(ED)/(BW)(AT) \quad \text{(B.2-9)}$$

TABLE B.2-3A

PARAMETERS USED TO ESTIMATE POTENTIAL EXPOSURES FOR CURRENT LAND USE RECEPTORS

Pathway Parameters	Trespassing Youth Age 7-18	Off-property Farmer Adult	Off-property Resident Child	User of Meat/Milk Products
All Pathways (unless otherwise noted)				
EF (d/yr)	52[d]	350[a]	350[a]	350[a]
ED (yr)	12[d]	70[a]	6[a]	70[a]
AT-Noncancer (d)[g]	4380[g]	25550[g]	2190[g]	25550[g]
AT-Cancer (d)[h]	25550[a,h]	25550[a,h]	25550[a,h]	25550[a,h]
BW (kg)	43[a]	70[a]	15[a]	70[a]
Inhalation of Particulates				
IR (m^3/hr)	0.83[b]	0.83[b]	0.5[q]	NA[c]
ET (hr/d)	4[d]	5.7[f]	2[a]	NA
C_a (mg/m^3) (pCi/m^3)	csv[k]	csv	csv	NA
Ingestion of Soil				
IR (mg/d)	100[a]	NA	NA	NA
FI (unitless)	0.19[i]	NA	NA	NA
C_s (mg/kg) (pCi/g)	csv	NA	NA	NA
CF - rads (g/mg)	1.0E-3	NA	NA	NA
CF - chem (kg/mg)	1.0E-6	NA	NA	NA
Ingestion of Sediment				
IR (mg/d)	100[a]	NA	NA	NA
FI (unitless)	0.06[i]	NA	NA	NA
C_s (mg/kg) (pCi/g)	csv	NA	NA	NA
CF - rads (g/mg)	1.0E-3	NA	NA	NA
CF - chem (kg/mg)	1.0E-6	NA	NA	NA

See footnotes at end of table.

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TABLE B.2-3A
(Continued)

Pathway Parameters	Trespassing Youth Age 7-18	Off-property Farmer Adult	Off-property Resident Child	User of Meat/Milk Products
Dermal Contact with Soil				
SA (cm^2)	4200[a]	NA	NA	NA
AF (mg/cm^2-d)	1[j]	NA	NA	NA
ABS (unitless)	csv	NA	NA	NA
C_s (mg/kg)	csv	NA	NA	NA
CF (kg/mg)	1.0E-6	NA	NA	NA
Dermal Contact with Sediment				
SA (cm^2)	5130[j]	NA	NA	NA
AF (mg/cm^2-d)	1[a]	NA	NA	NA
ABS (unitless)	csv	NA	NA	NA
C_s (mg/kg)	csv	NA	NA	NA
CF (kg/mg)	1.0E-6	NA	NA	NA
External Radiation Exposure				
C_r (pCi/g)	csv	NA	NA	NA
ET indoors (hr/d)	NA	NA	NA	NA
ET outdoors (hr/d) sed	1[i]	NA	NA	NA
ET outdoors (hr/d) soil	3[i]	NA	NA	NA
SH indoors (unitless)	NA	NA	NA	NA
SH outdoors (unitless)	0[a]	NA	NA	NA
CF (yr/hr)	1.14E-4	NA	NA	NA
Ingestion of Surface Water				
IR (L/hr)	0.035[p]	NA	NA	NA
ET (hr/day)	1.0[p]	NA	NA	NA
C_{sw} (mg/L) (pCi/L)	csv	NA	NA	NA

See footnotes at end of table.

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TABLE B.2-3A
(Continued)

Pathway Parameters	Trespassing Youth Age 7-18	Off-property Farmer Adult	Off-property Resident Child	User of Meat/Milk Products
Dermal Contact with Surface Water				
SA (cm^2)	5130[a]	NA	NA	NA
DA (mg/cm^2-d)	csv	NA	NA	NA
Ingestion of Homegrown Fruits				
IR (kg/d)	NA	0.142[q]	0.204[q]	NA
FI (unitless)	NA	0.30[n]	0.3[n]	NA
C_{iv} (mg/kg) (pCi/g)	NA	csv	csv	NA
CF-RAD (g/kg)	NA	1.0E+3	1.0E+3	NA
Ingestion of Homegrown Vegetables				
IR (kg/d)	NA	0.201[q]	0.100[q]	NA
FI (unitless)	NA	0.40[n]	0.40[n]	NA
C_{iv} (mg/kg)(pCi/kg)	NA	csv	csv	NA
CF-RAD (g/kg)	NA	1.0E+3	1.0E+3	NA
Ingestion of Home Produced Meats				
IR (meat) (kg/d)	NA	0.101[l]	0.039[l]	0.101[l]
FI (unitless)	NA	0.75[m]	0.75[m]	0.75[m]
C_{ia} (mg/kg)(pCi/kg)	NA	csv	csv	csv
Ingestion of Milk				
IR (L/day)	NA	0.4[s]	0.9[s]	0.4[s]
FI (unitless)	NA	0.75[o]	0.75[o]	0.75[o]
C_{im} (mg/L) (pCi/L)	NA	csv	csv	csv
Dermal Contact While Bathing				
SA (cm^2)	NA	NA	NA	NA
DA_a (mg/cm^2 - d)	NA	NA	NA	NA
Inhalation of Volatiles Released from Household Water Use				
IR (m^3/d)	NA	NA	NA	NA

See footnotes at end of table.

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TABLE B.2-3A
(Continued)

Pathway Parameters	Trespassing Youth Age 7-18	Off-property Farmer Adult	Off-property Resident Child	User of Meat/Milk Products
C_w (mg/L)	NA	NA	NA	NA
K (L/m^3)	NA	NA	NA	NA

[a]Parameter values obtained from the Risk Assessment Work Plan Addendum (DOE 1992a) and revisions per comments received from EPA, unless otherwise noted.

[b]Derived by dividing the default adult human inhalation rate of 20 m^3/day (EPA 1989a, Risk Assessment Guidance for Superfund) by 24 hours/day, and rounding to two significant figures.

[c]NA = Not applicable.

[d]DOE 1993-Comment Response-SWCR: standard trespass scenario assumes 4 hr/d, 3 d/wk for months June through August=36 day plus 1 d/wk for months April, May, September, and October=16 days for a total of 52 d/yr.

[e]Assumes the worker is a groundskeeper, who works 8 hours/day, 1 day/week, 35 weeks/year on the ground of Operable Unit 2.

[f]Assumes a farmer works outdoors for 2,000 hours during the 365 days of exposure a year (5.7h/d=2000h/y/350d/y). Indoor duration is the remaining time in day.

[g]Calculated as the product of ED (years) x 365 days/year.

[h]Calculated as the product of 70 years (assumed lifetime) x 365 days/year.

[i]Assumed a trespassing child spends 4 of 16 waking hours/day on site; of the 4 hours, 3 hours are exposure from soil and 1 hour is exposure from sediment. Fraction of waking hours (16 hrs/day) that are spent on site.

[j]EPA 1992f, Dermal Exposure Assessment: Principles and Applications, EPA/600/8-91/011B

[k]csv = Chemical-specific value.

[l]EPA 1990d, EPA/600/8-89/043, Exposure Factor Handbook, IR for beef and milk are from pg. 2-27; IR for drinking water, pg. 2-3; IR for fish, pg. 2-3.

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TABLE B.2-3A
(Continued)

[m]USDA 1985, Report No. 85-1, National Food Consumption Food Survey, values include a fraction of food produced at home, i.e.: .35 for fruits and vegetables, .75 for meats, and .75 for milk (as recommended in the Exposure Factor Handbook).

[n]DOE 1994, Supplemental Guidance to the Risk Assessment Work Plan Addendum.

[o]Based on specific biomedical values provided from the Childrens Hospital at the University of Cincinnati.

[p]Assumption. The Superfund Exposure Assessment Manual, (EPA 1988c), p. 129, recommends 50 ml/hr for swimming, but Paddys Run is an intermittent stream not deep enough for swimming. Therefore, a slightly lower value of 35 ml/hr seems reasonable.

[q]EPA 1990d, "Exposure Factor Handbook" EPA/600/8-89/043. Fraction of time homegrown produce is eaten (FI) is from the (FI) presented in Part II, Page 1-10; IR for beef and milk are from page 2-27; IR for drinking water, page 2-3.

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TABLE B.2-3B

PARAMETERS USED TO ESTIMATE POTENTIAL EXPOSURES FOR CURRENT LAND USE RECEPTORS

Pathway Parameters	Groundskeeper	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential
All Pathways (unless otherwise noted)				
EF (d/yr)	35[c]	7[m]	350[m]	350[m]
ED (yr)	25[c,l]	30[m]	70[m]	70[m]
BW (kg)	70[a]	70[a]	70[a]	70[a]
AT-Noncancer (d)[g]	9125[d]	10950[d]	25550[d]	25550[d]
AT-Cancer (d)[h]	25550[a,e]	25550[a,c]	25550[a,e]	25550[a,e]
Inhalation of Particulates and Radionuclides				
IR (m^3/hr)	2.5[l]	NA[b]	NA	NA
ET (hr/d)	8[l]	NA	NA	NA
C_a (mg/m^3) (pCi/m^3)	csv[g]	NA	NA	NA
Ingestion of Soil				
IR (mg/d)	100[a]	NA	NA	NA
FI (unitless)	1.0[a]	NA	NA	NA
C_s (mg/kg) (pCi/g)	csv	NA	NA	NA
CF - rads (g/mg)	1.0E-03	NA	NA	NA
CF - chem (kg/mg)	1.0E-06	NA	NA	NA
Ingestion of Sediment				
IR (mg/d)	NA	NA	NA	NA
FI (unitless)	NA	NA	NA	NA
C_{sd} (mg/kg) (pCi/g)	NA	NA	NA	NA
CF - rads (g/mg)	NA	NA	NA	NA
CF - chem (kg/mg)	NA	NA	NA	NA

See footnotes at end of table.

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TABLE B.2-3B
(Continued)

Pathway Parameters	Groundskeeper	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential
Dermal Contact with Soil				
SA (cm^2)	5750[f]	NA	NA	NA
AF (mg/cm^2 -d)	1.0[f]	NA	NA	NA
ABS (unitless)	csv	NA	NA	NA
C_s (mg/kg)	csv	NA	NA	NA
CF (kg/mg)	1.0 E-6	NA	NA	NA
Dermal Contact with Sediment				
SA (cm^2)	NA	NA	NA	NA
AF (mg/cm^2 -d)	NA	NA	NA	NA
ABS (unitless)	NA	NA	NA	NA
C_{sd} (mg/kg)	NA	NA	NA	NA
CF (kg/mg)	NA	NA	NA	NA
External Radiation Exposure				
C_r (pCi/g)	csv	NA	NA	NA
ET indoors (hr/d)	NA	NA	NA	NA
ET outdoors (hr/d) sed	NA	NA	NA	NA
ET outdoors (hr/d) soil	8[c,l]	NA	NA	NA
SH indoors (unitless)	NA	NA	NA	NA
SH outdoors (unitless)	0[a]	NA	NA	NA
CF (yr/hr)	1.14 E-4	NA	NA	NA
Ingestion of Surface Water				
IR (L/hr)	NA	0.05	NA	NA
ET (hr/day)	NA	2.6	NA	NA
C_{sw} (mg/L) (pCi/L)	NA	csv	NA	NA

See footnotes at end of table.

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TABLE B.2-3B
(Continued)

Pathway Parameters	Groundskeeper	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential
Dermal Contact with Surface Water				
SA (cm^2)	NA	23000[f]	NA	NA
DA (mg/cm^2-d)	NA	csv	NA	NA
Ingestion of Fish				
IR (kg/d)	NA	0.054[m]	NA	NA
EF (d/yr)	NA	122[m]	NA	NA
C_{if} (mg/kg)(pCi/g)	NA	csv	NA	NA
CF (g/kg)	NA	1.0E+3	NA	NA
Ingestion of Homegrown Fruits				
IR (kg/d)	NA	NA	0.142[f]	NA
FI (unitless)	NA	NA	0.30[j]	NA
C_{iv} (mg/kg) (pCi/g)	NA	NA	csv	NA
CF RAD (g/kg)	NA	NA	1.0E+3	NA
Ingestion of Homegrown Vegetables				
IR (kg/d)	NA	NA	0.201[f]	NA
FI (unitless)	NA	NA	0.40[j]	NA
C_{iv} (mg/kg)(pCi/g)	NA	NA	csv	NA
CF RAD (g/kg)	NA	NA	1.0E+3	NA
Ingestion of Home Produced Meats				
IR (meat) (kg/d)	NA	NA	0.101[h]	NA
FI (unitless)	NA	NA	0.75[j]	NA
C_{ia} (mg/kg)(pCi/kg)	NA	NA	csv	NA
Ingestion of Milk				
IR (L/day)	NA	NA	0.4[h]	NA
FI (unitless)	NA	NA	0.75[j]	NA
C_{im} (mg/L) (pCi/L)	NA	NA	csv	NA

See footnotes at end of table.

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TABLE B.2-3B
(Continued)

Pathway Parameters	Groundskeeper	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential
Ingestion of Drinking Water				
IR (L/day)	NA	NA	NA	2
FI (unitless)	NA	NA	NA	1
C_w (mg/L) (pCi/L)	NA	NA	NA	csv
Dermal Contact While Bathing				
SA (cm^2)	NA	NA	NA	23000[f]
DA_a (mg/cm^2 - d)	NA	NA	NA	csv
Inhalation of Volatiles Released from Household Water Use				
IR (m^3/d)	NA	NA	NA	15[i]
C_w (mg/L)	NA	NA	NA	csv
K (L/m^3)	NA	NA	NA	0.5[k]

[a]Parameter values obtained from the Risk Assessment Work Plan Addendum (DOE 1992a) and revisions per comments received from EPA, unless otherwise noted.

[b]NA = Not applicable.

[c]Assumes the worker is a groundskeeper, who works 8 hours/day, 1 day/week, 35 weeks/year on the ground of Operable Unit 2.

[d]Calculated as the product of ED (years) x 365 days/year.

[e]Calculated as the product of 70 years (assumed lifetime) x 365 days/year.

[f]EPA 1992f, Dermal Exposure Assessment: Principles and Applications, EPA/600/8-91/011B

[g]csv = Chemical-specific value.

[h]EPA 1990d, EPA/600/8-89/043, Exposure Factor Handbook, IR for beef and milk are from pg. 2-27; IR for drinking water, pg. 2-3; IR for fish, pg. 2-3.

[i]EPA 1991d, OSWER Directive 9285.7-0113, RAGS, Volume 1, Part B.

[j]USDA 1985, Report No. 85-1, National Food Consumption Food Survey, values include a fraction of food produced at home, i.e.: .35 for fruits and vegetables, .75 for meats, and .75 for milk (as recommended in the Exposure Factor Handbook).

See footnotes at end of table.

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TABLE B.2-3B
(Continued)

[k]EPA 1991d RAGS, Vol. 1, Part B, pg. 20-22. Using the Andelman Model 1990, it is assumed that half the concentration of volatile chemicals in water transfer to air.

[l]EPA 1991f, Standard Default Exposure Factors, OSWER directive 9285.6-03.

[m]DOE 1994, Supplemental Guidance to the Risk Assessment Work Plan Addendum.

TABLE B.2-4A

PARAMETERS USED TO ESTIMATE POTENTIAL EXPOSURES FOR FUTURE LAND USE RECEPTORS

Pathway Parameters	RME On-property Resident Farmer Age 1-70	CT On-property Resident Farmer Age 1-70	On-property Resident Child Age 1-6	Off-property Resident Farmer Age 1-70	Off-property Resident Child Age 1-6	On-property Homebuilder
All pathways (except where noted)						
EF (d/yr)	350[a]	234	350[a]	350[a]	350[a]	175[e]
ED (yr)	70[a]	9[i]	6[a]	70[a]	6[a]	0.48[e]
BW (kg)	70[a]	70[a]	15[a]	70[a]	15[a]	70[a]
AT-Noncancer (d)	25550[a,j]	3285[a]	2190[a]	25550[a]	2190[a]	175[e]
AT-Cancer (d)	25550[a,k]	25550[a]	25550[a]	25550[a]	25550[a]	25550[a]
Inhalation of Particulates						
IR (m^3/hr)	0.83[c]	0.83[c]	0.5	0.83[c]	0.5[d]	2.5
ET (hr/d)	5.7[f]	4.9[e]	2[a]	5.7[f]	2[g]	10[w]
C_a (mg/m^3) (pCi/m^3)	csv	csv[m]	csv	csv	csv	csv
Inhalation of Indoor Radon						
IR (m^3/d)	15[s]	15[s]	15[s]	NA[b]	NA	NA
C_{Rn} (pCi/m^3)	csv	csv	csv	NA	NA	NA
Ingestion of Drinking Water						
IR (L/d)	2[u]	1.4[e]	1.0[u]	2[u]	1.0[u]	NA
FI (unitless)	1	1	1	1	1	NA
C_w (pCi/L) (mg/L)	csv	csv	csv	csv	csv	NA
Inhalation of Volatiles Released from Household Water Use						
IR (m^3/d)	15[s]	15[s]	15[s]	15[s]	15[s]	NA
K (L/m^3)	0.5[s]	0.5[s]	0.5[s]	0.5[s]	0.5[s]	NA
C_w (mg/L)	csv	csv	csv	csv	csv	NA

See footnotes at end of table.

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TABLE B.2-4A
(Continued)

Pathway Parameters	RME On-property Resident Farmer Age 1-70	CT On-property Resident Farmer Age 1-70	On-property Resident Child Age 1-6	Off-property Resident Farmer Age 1-70	Off-property Resident Child Age 1-6	On-property Homebuilder
Dermal Contact While Bathing						
SA (cm^2)	23000[l]	20000[l]	8000[l]	23000[l]	8000[l]	NA
DA_w (mg/cm^2 - d)	csv	csv	csv	csv	csv	NA
Ingestion of Soil						
IR (mg/d)	180[v]	100[e]	200[v]	NA	NA	480[l]
FI (unitless)	1[n]	1[l]	1[n]	NA	NA	1[h]
C_s (mg/kg) (pCi/g)	csv	csv	csv	NA	NA	csv
CF - rads (g/mg)	1.0E-3	1.0E-3	1.0E-3	NA	NA	1.0E-3
CF - chem (kg/mg)	1.0E-6	1.0E-6	1.0E-6	NA	NA	1.0E-6
Dermal Contact with Soil						
SA (cm^2)	5750[l]	5000[l]	2000[l]	NA	NA	5750[l]
AF (mg/cm^2 -d)	1.0[l]	0.2[l]	1.0[l]	NA	NA	1.0
ABS (unitless)	csv	csv	csv	NA	NA	1.0[l]
C_s (mg/kg)	csv	csv	csv	NA	NA	csv
CF (kg/mg)	1.0E-6	1.0E-6	1.0E-6	NA	NA	1.0E-6
C_s (mg/kg)	csv	csv	csv	NA	NA	csv
External Radiation Exposure						
ET indoors (hr/d)	18.3[f]	19.1[e]	22[g]	NA	NA	4[e]
ET outdoors (hr/d)	5.7[f]	4.9[e]	2[g]	NA	NA	4[e]
SH indoors (unitless)	0.5[a]	0.5[a]	0.5[a]	NA	NA	0.5[a]
SH outdoors (unitless)	0[a]	0[a]	0[a]	NA	NA	0[a]
C_r (pCi/g)	csv	csv	csv	NA	NA	csv
CF (yr/hr)	1.14E-4	1.14E-4	1.14E-4	NA	NA	1.14E-4

See footnotes at end of table.

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TABLE B.2-4A
(Continued)

Pathway Parameters	RME On-property Resident Farmer Age 1-70	CT On-property Resident Farmer Age 1-70	On-property Resident Child Age 1-6	Off-property Resident Farmer Age 1-70	Off-property Resident Child Age 1-6	On-property Homebuilder
Ingestion of Homegrown Fruits						
IR (kg/d)	0.142[e]	0.142[e]	0.204[e]	0.142[e]	0.204[e]	NA
FI (unitless)	0.30[e]	0.20[e]	0.30[e]	0.30[e]	0.30[e]	NA
CF RAD (g/kg)	1.0E+3	1.0E+3	1.0E+3	1.0E+3	1.0E+3	NA
C_{fr} (mg/kg) (pCi/g)	csv	csv	csv	csv	csv	NA
Ingestion of Vegetables						
IR (kg/d)	0.201[e]	0.201[e]	0.100[e]	0.201	0.100[e]	NA
FI (unitless)	0.40[e]	0.25[e]	0.40[e]	0.40	0.40	NA
C_s (mg/kg) pCi/g)	csv	csv	csv	csv	csv	NA
CF RAD (g/kg)	1.0E+3	1.0E+3	1.0E+3	1.0E+3	csv	NA
Ingestion of Home Produced Meats						
IR (kg/d)	0.101[t,o]	0.101[e]	0.039[t,o]	0.101[t,o]	0.039[t,o]	NA
FI (unitless)	0.75[t]	0.5[e]	0.75[t,o]	0.75[t,o]	0.75[t]	NA
C_{ia} (mg/kg) (pCi/g)	csv	csv	csv	csv	csv	NA
Ingestion of Milk						
IR (L/day)	0.4[o,a]	0.4[o,a]	0.9[o,a]	0.4[o,a]	0.9[a]	NA
FI (unitless)	0.75[t]	0.53[t]	0.75[t]	0.75[t]	0.75[t]	NA
C_{im} (mg/L) (pCi/L)	csv	csv	csv	csv	csv	NA
Ingestion of Surface Water						
C_{isw} (mg/L) (pCi/L)	NA	NA	NA	NA	NA	NA
ET (hr/d)	NA	NA	NA	NA	NA	NA
IR (L/hr)	NA	NA	NA	NA	NA	NA

See footnotes at end of table.

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TABLE B.2-4A
(Continued)

Pathway Parameters	RME On-property Resident Farmer Age 1-70	CT On-property Resident Farmer Age 1-70	On-property Resident Child Age 1-6	Off-property Resident Farmer Age 1-70	Off-property Resident Child Age 1-6	On-property Homebuilder
Dermal Contact with Surface Water						
SA (cm^2)	NA	NA	NA	NA	NA	NA
DA (mg/cm^2-d)	NA	NA	NA	NA	NA	NA

[a]Parameter values obtained from the RAWPA (DOE 1992a) and revisions per comments received from EPA, unless otherwise noted.

[b]NA = Not applicable.

[c]Derived by dividing the default adult human inhalation rate of 20 m^3/day (EPA 1989a, Risk Assessment Guidance for Superfund) by 24 hours/day, and rounding to two significant figures.

[d]EPA 1993c, "Risk-Based Concentration Table, Second Quarter 1993" EPA Region III, May 10.

[e]Parameter values obtained from the Supplemental Guidance to the RAWPA (DOE 1994) and revisions per OU1 RI, May 1994 comments. Assumes 175 days of Homebuilding Activities.

[f]Special guidance from EPA Region V. 8 hrs/d spent outdoors for 250 d/yr = 2000 hrs/d; this value divided by 350 d/yr on site = 5.7 hrs/d spent outdoors; 18.3 hrs/d spent indoors determined by difference.

[g]Assumes a small resident child spends 700 hrs/yr outdoors.

[h]Specific guidance form EPA Region V (1/6/94 comments on OU4 RI Final Report): Standard trespass scenario assumes 3 d/wk for months June through August = 36 days plus 1 d/wk for months April, May September, and October = 16 days for a total.

[i]EPA 1991b, Risk Assessment Guidance for Superfund: Vol. I - Human Health Evaluation Manual Supplemental Guidance "Standard Default Exposure Factors", Interim Final, OSWER Directive: 9285.6-03.

[j]Calculated as the product of ED (years) x 365 days/year.

[k]Calculated as the product of 70 years (assumed lifetime) x 365 days/year.

[l]EPA 1992f, "Dermal Exposure Assessment: Principals and Applications", EPA/600/8-91/011B.

TABLE B.2-4A
(Continued)

[m]csv = Chemical-specific values, - PC and ABS from Table D.3-14; DR from Table D.3-15.

[n]Assumed value based on fraction of day spent on site.

[o]EPA 1990d, "Exposure Factor Handbook" EPA/600/8-89/043. Fraction of time homegrown produce is eaten (FI) is from Part II, page 1-10; IR for beef and milk are from page 2-27; IR for drinking water, page 2-3; IR for fish, page 2-3.

[p]Assumes the expanded trespasser visits the site 110 day/yr (2 hr/day) as a youth, and 40 days/yr (1 hr/day) as an adult for a total of 44 years. Only the youth plays in Paddys Run.

[q]Assumes a wading scenario because Paddys Run is too shallow for swimming, therefore, approximately 31% of total body surface for feet, lower legs, hands, and forearms.

[r]Assumption, "Superfund Exposure Assessment Manual", EPA 1988c, pg. 129, recommends 50 ml/hr for swimming, but Paddys Run is an intermittent stream not deep enough for swimming. Therefore, a slightly lower value seems reasonable.

[s]EPA 1991d Risk Assessment Guidance for Superfund: Vol.1, Part B, pg 20-22, Using the Andelman Model 1990, it is assumed that half the concentration of volatile chemicals in water transfer to air.

[t]USDA 1985, Report No. 85-1, National Food Consumption Food Survey, values include a fraction of food produced at home, i.e.: .30 for fruits and .40 for vegetables, 0.75 for meats, and 0.75 for milk (as recommended in the Exposure Factor Handbook).

[u]EPA 1989a, Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual Part A. EPA/54011-89/002.

[v]Soil ingestion rates for the farmers are from OU4 RI comments and responses, stating that the soil ingestion rate of 180 mg/day represents an age occupational adjusted value.

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TABLE B.2-4B

PARAMETERS USED TO ESTIMATE POTENTIAL EXPOSURES FOR FUTURE LAND USE RECEPTORS

Pathway Parameters	Expanded Trespasser Youth	Expanded Trespasser Adult	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential	Perched Groundwater User
All pathways (except where noted)						
EF (d/yr)	110[e]	40	7[s]	350[s]	350[s]	350[a]
ED (yr)	12[e]	32	30[s]	70[s]	70[s]	70[a]
BW (kg)	43[a]	70	70[a]	70[a]	70[a]	70[a]
AT-Noncancer (d)	4380[a,g]	11680[a,g]	10950[e,g]	25550[a,g]	25550[a,g]	25550[a,g]
AT-Cancer (d)	25550[a,h]	25550[a,h]	25550[a,h]	25550[a,h]	25550[a,h]	25550[a,h]
Inhalation of Particulates						
IR (m^3/hr)	0.83[c]	0.83[c]	NA[b]	NA	NA	0.83[c]
ET (hr/d)	2[p]	1[p]	NA	NA	NA	5.7[f]
C_a (mg/m^3) (pCi/m^3)	csv	csv	NA	NA	NA	csv
Inhalation of Indoor Radon						
IR (m^3/d)	NA	NA	NA	NA	NA	15[s]
C_{Rn}(pCi/m^3)	NA	NA	NA	NA	NA	csv
Ingestion of Drinking Water						
IR (L/d)	NA	NA	NA	NA	2[s]	2[u]
FI (unitless)	NA	NA	NA	NA	1[s]	1
C_w (pCi/L) (mg/L)	NA	NA	NA	NA	csv	csv
Inhalation of Volatiles Released from Household Water Use						
IR (m^3/d)	NA	NA	NA	NA	15[e,o]	15[s]
K (L/m^3)	NA	NA	NA	NA	0.5[e,o]	0.5[s]
C_w (mg/L)	NA	NA	NA	NA	csv	csv

See footnotes at end of table.

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TABLE B.2-4B
(Continued)

Pathway Parameters	Expanded Trespasser Youth	Expanded Trespasser Adult	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential	Perched Groundwater User
Dermal Contact While Bathing						
SA (cm^2)	NA	NA	NA	NA	23000[t]	23000[t]
DA_w (mg/cm^2 - d)	NA	NA	NA	NA	csv	csv
Ingestion of Soil						
IR (mg/d)	100[e]	100[e]	NA	NA	NA	180[v]
FI (unitless)	0.12[r]	0.125[r]	NA	NA	NA	1
C_s (mg/kg) (pCi/g)	csv	csv	NA	NA	NA	csv
CF - rads (g/mg)	1.0E-3	1.0E-3	NA	NA	NA	1.0E-3
CF - chem (kg/mg)	1.0E-6	1.0E-6	NA	NA	NA	1.0E-6
Ingestion of Sediment						
IR (mg/d)	100[e]	NA	NA	NA	NA	NA
FI (unitless)	0.063[r]	NA	NA	NA	NA	NA
C_{sd} (mg/kg) (pCi/g)	csv	NA	NA	NA	NA	NA
CF - rads (g/mg)	1.0E-3	NA	NA	NA	NA	NA
CF - chem (kg/mg)	1.0E-6	NA	NA	NA	NA	NA
Dermal Contact Sediment						
SA (cm^2)	5130[e]	NA	NA	NA	NA	NA
AF (mg/cm^2 -d)	1.0[e]	NA	NA	NA	NA	NA
ABS (unitless)	csv	NA	NA	NA	NA	NA
C_{sd} (mg/kg)(pCi/g)	csv	NA	NA	NA	NA	NA
CF chem (kg/mg)	1.0E-6	NA	NA	NA	NA	NA

See footnotes at end of table.

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TABLE B.2-4B
(Continued)

Pathway Parameters	Expanded Trespasser Youth	Expanded Trespasser Adult	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential	Perched Groundwater User
Dermal Contact with Soil						
SA (cm^2)	4200[l]	5750	NA	NA	NA	5750[l]
AF (mg/cm^2 -d)	1.0[i]	1.0[i]	NA	NA	NA	1.0[l]
ABS (unitless)	csv	csv	NA	NA	NA	csv
C_s (mg/kg) (pCi/g)	csv	csv	NA	NA	NA	csv
CF (kg/mg)	1.0E-6	1.0E-6	NA	NA	NA	1.0E-6
External Radiation Exposure						
ET indoors (hr/d)	NA	NA	NA	NA	NA	18.3
ET outdoors (hr/d)	2[p]	1[p]	NA	NA	NA	5.7
SH indoors (unitless)	NA	NA	NA	NA	NA	0.5
SH outdoors (unitless)	0[a]	0[a]	NA	NA	NA	0
C_r (pCi/g)	csv	csv	NA	NA	NA	csv
CF (yr/hr)	1.14E-4	1.14E-4	NA	NA	NA	1.14E-4
Ingestion of Homegrown Fruits						
IR (kg/d)	NA	NA	NA	0.142[k,r]	NA	0.142[e]
FI (unitless)	NA	NA	NA	0.3O[p,r]	NA	0.30[e]
C_{fr} (mg/kg) (pCi/g)	NA	NA	NA	csv	NA	cvs
CF-RAD (g/kg)	NA	NA	NA	1.0E+3	NA	1.0E+3
Ingestion of Vegetables						
IR (kg/d)	NA	NA	NA	0.201[r]	NA	0.201
FI (unitless)	NA	NA	NA	0.40[p,r]	NA	0.40
CF RAD (g/kg)	NA	NA	NA	1.0E+3	NA	1.0E+3
C_{iv} (mg/kg) (pCi/g)	NA	NA	NA	csv	NA	csv

See footnotes at end of table.

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TABLE B.2-4B
(Continued)

Pathway Parameters	Expanded Trespasser Youth	Expanded Trespasser Adult	User of GMR Recreational	User of GMR Agricultural	User of GMR Residential	Perched Groundwater User
Ingestion of Home Produced Meats						
IR (kg/d)	NA	NA	NA	0.101[k,r]	NA	0.101[e]
FI (unitless)	NA	NA	NA	0.75[p,r]	NA	0.75[e]
C_{ia} (mg/kg) (pCi/kg)	NA	NA	NA	csv	NA	csv
Ingestion of Milk						
IR (L/day)	NA	NA	NA	0.4[k,r]	NA	0.4[e]
FI (unitless)	NA	NA	NA	0.75[p, r]	NA	0.75[e]
C_{im} (mg/L) (pCi/L)	NA	NA	NA	csv	NA	csv
Ingestion of Surface Water						
IR (L/hr)	0.035[s]	NA	0.5[n]	NA	NA	NA
ET (hr/d)	1	NA	2.6	NA	NA	NA
C_{isw} (mg/L) (pCi/L)	csv	NA	csv	NA	NA	NA
Dermal Contact with Surface Water						
SA (cm^2)	5130[m]	NA	23000[e]	NA	NA	NA
DA (mg/cm^2-d)	csv	NA	csv	NA	NA	NA
Ingestion of Fish						
IR (kg/d)	NA	NA	0.054[r]	NA	NA	NA
EF (d/yr)	NA	NA	122[r]	NA	NA	NA
C_{if} (mg/kg) (pCi/g)	NA	NA	csv	NA	NA	NA
CF RAD (g/kg)	NA	NA	1.0E+3	NA	NA	NA

See footnotes at end of table.

TABLE B.2-4B
(Continued)

[a]Parameter values obtained from the RAWPA (DOE 1992a) and revisions per comments received from EPA, unless otherwise noted.

[b]NA = Not applicable.

[c]Derived by dividing the default adult human inhalation rate of 20 m^3/day (EPA 1989a, Risk Assessment Guidance for Superfund) by 24 hours/day, and rounding to two significant figures.

[d]Special guidance from EPA Region V. 8 hrs/d spent outdoors for 250 d/yr = 2000 hrs/d; this value divided by 350 d/yr on site = 5.7 hrs/d spent outdoors; 18.3 hrs/d spent indoors determined by difference.

[e]Specific guidance form EPA Region V (1/6/94 comments on OU4-RI Final Report): Standard trespass scenario assumes 3 d/wk for months June through August = 36 days plus 1 d/wk for months April, May September, and October = 16 days for a total.

[f]EPA 1991d, Risk Assessment Guidance for Superfund: Vol. I - Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals, Interim, OSWER Directive: 9285.7-01B.

[g]Calculated as the product of ED (years) x 365 days/year.

[h]Calculated as the product of 70 years (assumed lifetime) x 365 days/year.

[i]EPA 1992f, "Dermal Exposure Assessment: Principals and Applications", EPA/600/8-91/011B.

[j]csv = Chemical-specific values

[k]EPA 1990d, "Exposure Factor Handbook" EPA/600/8-89/043. Fraction of time homegrown produce is eaten (FI) is from Part II, page 1-10; IR for beef and milk are from page 2-27; IR for drinking water, page 2-3; IR for fish, page 2-3.

[l]Assumes the expanded trespasser visits the site 110 day/yr (2 hr/day) as a youth, and 40 days/yr (1 hr/day) as an adult for a total of 44 years. Only the youth plays in Paddys Run.

[m]Assumes a wading scenario because Paddys Run is too shallow for swimming, therefore, approximately 31% of total body surface for feet, lower legs, hands, and forearms.

[n]Assumption, "Superfund Exposure Assessment Manual", EPA 1988c, pg. 129, recommends 50 ml/hr for swimming, but Paddys Run is an intermittent stream not deep enough for swimming. Therefore, a slightly lower value seems reasonable.

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TABLE B.2-4B
(Continued)

[o]EPA 1991d Risk Assessment Guidance for Superfund: Vol.1, Part B, pg 20-22, Using the Andelman Model 1990, it is assumed that half the concentration of volatile chemicals in water transfer to air.

[p]USDA 1985, Report No. 85-1, National Food Consumption Food Survey, values include a fraction of food produced at home, i.e.: .30 for fruits and .40 for vegetables, 0.75 for meats, and 0.75 for milk (as recommended in the Exposure Factor Handbook).

[q]EPA 1989, Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual Part A. EPA/5401-89/002.

[r]Parameter values obtained from the Supplemental Guidance to the RAWPA (DOE 1994) and revisions per comments received from EPA.

[s]Soil ingestion rates for the farmers are from OU4 RI comments and responses, stating that the soil ingestion rate of 180 mg/day represents an age occupational adjusted value.

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where:

I_s = intake from soil (pCi) or (mg/kg-day)

C_s = concentration in soil (pCi/g) or (mg/kg)

IR = ingestion rate (mg/day) or (mg/day)

CF = conversion factor (10^{-3}g/mg-Rad, 10^{-6} kg/mg chem)

FI = fraction ingested from contaminated source (unitless)

EF = exposure frequency (days/yr)

ED = exposure duration (yr)

BW = body weight (kg)

AT = averaging time (equals ED x 365 days/yr) (days)

B.2.4.2.2 Ingestion of Vegetables and Fruit

Ingestion of farm and homegrown products irrigated with contaminated groundwater is evaluated in this Operable Unit 2 baseline risk assessment for the future land use pathways. The equations used to estimate exposure to chemicals and radionuclides via ingestion of vegetables irrigated with contaminated water are from the NRC (NRC 1977) and the EPA (EPA 1989a). The two-step process involves the calculation of the concentration of the constituent on and in the plant as a result of foliar deposition and root uptake, followed by the calculation of intake from consumption of the plant by humans. The model used to estimate the concentration in and on vegetation irrigated with contaminated water is (NRC 1977):

$$C_{vwi} = d_w \left[\frac{r_w \left(1 - e^{-\lambda_{Ei} t_e}\right)}{Y \lambda_{Ei}} + \frac{f_w B_{iv(2)} \left(1 - e^{-\lambda_{di} t_{bw}}\right)}{\rho \lambda_{di}} \right] e^{-\lambda_{ri} t_h} \qquad \text{(B.2-10)}$$

where:

λ_{Ei} = effective depletion constant of ith contaminant on the surface plants (hr^{-1})

λ_{di} = effective depletion constant of ith contaminant in surface soils due to radioactive decay, chemical degredation, and leaching (hr^{-1})

λ_{ri} = radioactive or chemical decay constant of ith contaminant (hr^{-1})

$B_{iv(2)}$ = dry soil to wet plant partitioning coefficient of ith contaminant (C_{iw}/C_s)

C_{vwi} = concentration of ith contaminant in plants as a result of irrigating plants with contaminated water (pCi/g) (mg/g)

d_w = irrigation deposition rate (pCi/m^2-hr) (mg/m^2-hr)

f_w = fraction of year plant is irrigated (unitless)

ρ = effective dry surface density of the soil (g/m^2)

r_w = fraction of waterborne material retained on plant surface (unitless)

t_{bw} = direction or irrigation use (hr)

t_e = growing season (hrs)

t_h = duration of period between harvest and consumption (hr)

Y = agricultural yield (g/m^2)

The d_w term can be calculated by:

$$d_w = (C_{iw})(I)$$

where:

C_{iw} = concentration of ith contaminant in groundwater (pCi/L, rad)(mg/L, chem)

I = irrigation rate (L/m^2-hr)

The soil depletion coefficient used in equation B.2-10 and B.2-11 is calculated by:

$$\lambda_{di} = \lambda_{ri} + \lambda_{Li} \qquad \text{(B.2-12a)}$$

where the leaching coefficient (λ_{Li}) is calculated using the relationship (Baes and Sharp 1983):

$$\lambda_{Li} = \frac{V_w}{Z\theta\,[1 + \sigma\,(K_d/\theta)]} \qquad \text{(B.2-12b)}$$

and

λ_{Li} = leach rate (hr^{-1})

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V_w = percolation rate (cm/hr)

Z = depth of surface soil (15 cm)

σ = density of soil in root zone (nominally 1.5 g/cm^3)

K_d = water to soil partitioning coefficient (cm^3/g)

θ = moisture fraction of surface soil (measured at 0.17)

Site-specific and chemical-specific factors used in this and other food pathways are summarized in Tables B.2-5A, B.2-5B,and B.2-5C.

Deposition of contaminated dust contributes to the overall contaminant concentration in vegetables and fruit consumed by humans. Estimation of contaminant concentration due to aerial deposition on vegetables and fruit uses equation B.2-11:

$$C_{avi} = d_d \left[\frac{r_d(1-e^{-\lambda_{Ei}})}{Y\lambda_{Ei}} + \frac{f_d B_{iv(z)} (1-e^{-\lambda_{di} t_e})}{P\lambda_{di}} \right] e^{-\lambda_{ri} t_h} \qquad \text{(B.2-11)}$$

where:

C_{avi} = concentration of the ith contaminant in/on vegetables and fruit (pCi/g, rad)(mg/g, chem)

λ_{di} = effective depletion constant of ith contaminant in surface soils due to radioactive decay, chemical degradation, and leaching (hr^{-1})

λ_{Ei} = effective depletion constant of ith contaminant on the surface plants also known as the weathering removal rate (hr^{-1})

λ_{ri} = radioactive or chemical decay constant of ith contaminant (hr^{-1})

$B_{iv(n)}$ = dry soil to wet plant partitioning coefficient of ith contaminant in feed and forage food crops (C_{iv}/C_s)

d_d = constituent's deposition rate (pCi/m^2-hr, rad)(mg/m^2-hr, chem)

f_d = fraction of year plant is down wind (unitless)

r_d = fraction of airborne material retained on surface plant (unitless)

t_e = growing season (hr)

TABLE B.2-5A

TRANSFER FACTORS (TF) USED IN EXPOSURE MODELS

Constituent	TRANSFER FACTORS					
	BCF Fish (L/g)	Beef TF (day/kg)	Milk TF (day/L)	$B_{iv(1)}$ (unitless)	$B_{iv(2)}$[1] (unitless)	Log K_{OW}[m]
RADIONUCLIDES						
Radium	5.00×10^{1}[a]	2.50×10^{-4}[b]	4.50×10^{-4}[b]	1.50×10^{-2}[b]	6.42×10^{-4}[b]	NA
Strontium	3.00×10^{1}[a]	3.00×10^{-4}[b]	1.50×10^{-3}[b]	2.50×10^{0}[b]	1.07×10^{-1}[b]	NA
Technetium	1.50×10^{1}[a]	8.50×10^{-3}[b]	1.00×10^{-2}[b]	9.50×10^{0}[b]	6.42×10^{-1}[b]	NA
Thorium	3.00×10^{1}[a]	6.00×10^{-6}[b]	5.00×10^{-6}[b]	8.50×10^{-4}[b]	3.64×10^{-5}[b]	NA
Uranium	2.00×10^{0}[a]	2.00×10^{-4}[b]	6.00×10^{-4}[b]	8.50×10^{-3}[b]	1.71×10^{-3}[b]	NA
INORGANICS						
Antimony	1.00×10^{0}[c]	1.00×10^{-3}[b]	1.00×10^{-4}[b]	2.00×10^{-1}[b]	1.28×10^{-2}[b]	NA
Arsenic	4.40×10^{1}[c]	2.00×10^{-3}[b]	6.00×10^{-5}[b]	4.00×10^{-2}[b]	2.57×10^{-3}[b]	NA
Barium	ND	1.50×10^{-4}[b]	3.50×10^{-4}[b]	1.50×10^{-1}[b]	6.42×10^{-3}[b]	NA
Beryllium	1.90×10^{1}[c]	1.00×10^{-3}[b]	9.00×10^{-7}[b]	1.00×10^{-2}[b]	6.42×10^{-4}[b]	NA
Cadmium (food)	8.10×10^{1}[c]	5.50×10^{-4}[b]	1.00×10^{-3}[b]	5.50×10^{-1}[b]	6.42×10^{-2}[b]	NA
Lead	4.90×10^{1}[c]	3.00×10^{-4}[b]	2.50×10^{-4}[b]	4.50×10^{-2}[b]	3.85×10^{-3}[b]	NA
Selenium	1.60×10^{1}[c]	1.50×10^{-2}[b]	4.00×10^{-3}[b]	2.50×10^{-2}[b]	1.07×10^{-2}[b]	NA
Thallium	ND	4.00×10^{-2}[b]	2.00×10^{-3}[b]	4.00×10^{-3}[b]	1.71×10^{-4}[b]	NA
Uranium	2.00×10^{0}[a]	2.00×10^{-4}[b]	6.00×10^{-4}[b]	8.50×10^{-3}[b]	1.71×10^{-3}[b]	NA
SEMIVOLATILE ORGANICS						
Benzo(a)anthracene	1.18×10^{4}[i]	1.15×10^{-5}[d]	3.63×10^{-3}[e]	2.07×10^{-2}[f]	8.87×10^{-3}[g]	5.66[h]
Benzo(a)pyrene	2.55×10^{4}[i]	3.16×10^{-5}[d]	1.00×10^{-2}[e]	1.15×10^{-2}[j]	4.94×10^{-3}[g]	6.10[h]
Benzo(b)fluoranthene	2.64×10^{4}[i]	3.31×10^{-5}[d]	1.05×10^{-2}[e]	1.12×10^{-2}[f]	4.81×10^{-3}[g]	6.12[h]
Benzo(g,h,i)perylene	1.84×10^{5}[i]	4.27×10^{-1}[d]	1.35×10^{-1}[e]	2.56×10^{-3}[f]	1.10×10^{-3}[g]	7.23[h]
SEMIVOLATILE ORGANICS (Continued)						
bis(2-Ethylhexyl)phthalate	6.28×10^{3}[i]	5.01×10^{-3}[d]	1.58×10^{-3}[e]	3.35×10^{-2}[f]	1.43×10^{-3}[g]	5.3[h]

See footnotes at end of table

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TABLE B.2-5A
(Continued)

Constituent	TRANSFER FACTORS					
	BCF Fish (L/g)	Beef TF (day/kg)	Milk TF (day/L)	$B_{iv(1)}$ (unitless)	$B_{iv(2)}$[l] (unitless)	Log K_{OW}[m]
Dibenzo(a,h)anthracene	2.03×10^{4}[i]	1.74×10^{-4}[d]	5.50×10^{-2}[e]	4.31×10^{-3}[f]	1.84×10^{-3}[g]	6.84[h]
Indeno(1,2,3-cd)pyrene	3.90×10^{5}[i]	9.55×10^{5}[d]	3.02×10^{-2}[e]	6.09×10^{-3}[f]	2.61×10^{-3}[g]	6.58[h]
Phenanthrene	1.75×10^{3}[c]	9.33×10^{-7}[d]	2.95×10^{-4}[e]	8.84×10^{-2}[f]	3.78×10^{-2}[g]	4.57
Tributyl phosphate	6.46×10^{2}[i]	2.51×10^{-4}[d]	7.94×10^{-5}[e]	1.89×10^{-1}[f]	8.09×10^{-2}[g]	4.00[h]
PESTICIDES/PCBS						
Aroclor-1254	2.25×10^{4}[c]	2.69×10^{-2}[j]	8.50×10^{-3}[j]	1.27×10^{-2}[j]	5.45×10^{-3}[g]	6.03
Aroclor-1260	1.59×10^{5}[k]	3.52×10^{-4}[d]	1.11×10^{-1}[e]	2.87×10^{-3}[f]	1.20×10^{-3}[g]	7.15
Dieldrin	4.76×10^{3}[c]	7.94×10^{-3}[j]	1.07×10^{-2}[j]	9.77×10^{-2}[j]	4.18×10^{-2}[g]	4.56

[a]NRC, 1984, "De Minimis Waste Impacts Analysis Methodology", NEREG/CR-3585.

[b]Baes, C.F. III, R.D. Sharp, A.L. Sjoreen, R.W. Shor, 1984, "A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides Through Agriculture", U.S. DOE, ORNL-5786.

[c]EPA, 1986a, Superfund Public Health Evaluation Manual (SPHEM).

[d]Log of biotransfer factor in beef (Log Bb) calculated from geometric mean regression model: Log Bb = -7.6 + Log K_{ow} (Travis & Arms 1988).

[e]Log of biotransfer factor in milk (Log Bm) calculated from geometric mean regression model: Log Bm = -8.10 + Log K_{ow} (Travis & Arms 1988).

[f]Log of bioconcentration factor in vegetation (Log Bv) calculate from geometric mean regression model: Log Bv = 1.588 - 0.578 Log K_{ow} (Travis & Arms 1988).

[g]This value was used for leafy vegetable uptake as well as forage plant uptake.

[h]EPA Weri Treatability Database (1991a).

[i]Calculated from log BCF = 0.76 x Log K_{ow} - 0.23 (Lyman et al. 1990).

[j]Value reported in Travis, C.C., and A.D. Armd, 1988, "Bioconcentration of Organics in Beef, Milk, and Vegetation", ES&T Vol. 22, No. 3, pp. 271-274.

[k]Value reported in Lyman et al. 1982, Handbook of Chemical Property Estimation Methods (Table 5-3).

[l]$B_{iv(2)}$ = dry weight to wet weight partitioning coefficient $B_{iv(1)}$ multiplied by an average correction factor of 0.428.

[m]EPA 1992f, "Dermal Exposure Assessment: Principles and Applications." All k_{ow}'s taken from this guidance, unless otherwise specified.

NA = Not available

ND = no data

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TABLE B.2-5B

PARAMETERS FOR VEGETABLE/FORAGE/MEAT/MILK/UPTAKE MODELS[a]

HOMEGROWN PRODUCE	
λ_{di} (1/h)	csv, See Table B.2-6B
λ_{w} (1/h)	2.10E-03
λ_{ri} (1/ri)	1.00E-14
$B_{iv(n)}$	csv, See Table B.2-5A
d_d (pCi/m^2-h; mg/m^2-h)	csv, See Table B.2-6B
f_d	1
r_d	0.25
t_h (h)	24
t_e (h)	1440
t_{bd} (h)	8760
Y (g/m^2; kg/m^2)	1.5
p (g/m^2; kg/m^2)	150
λ_{Li} (1/h)	csv, See Table B.2-6B
V_w (cm/h)	1.30E-03
z (cm)	15
K_d (cm^3/g)	csv, See Table B.2.5C
σ	1.5
v_d	1.80E-03
Θ	0.17
CF_p	1.00E-03
I(L/m^2-hr)	0.081
f_w	1
r_w	0.2
t_{bw}(h)	8760
F_{Ai} (d/g)	25
λ_{ri} (1/h)	24
t_h (h)	25
λ_{ri} (1/h)	24

BEEF AND MILK PRODUCTS	
C^{Ai}	Refer to intake tables
C^{afi}	Refer to intake tables
C^{agi}	Refer to intake tables
C^{asi}	Refer to intake tables
C^{Ai}	Refer to intake tables
C^{fi}	Refer to intake tables
C^{wi}	Refer to intake tables

[a]For concentration values, refer to intake tables and CPC tables in Appendix B.III.

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TABLE B.2-5C

CHEMICAL SPECIFIC VALUES
HOMEGROWN PRODUCE/BEEF AND MILK

Parameter	K_d	$Lambda^{Li}$	$Lambda^{ri}$	$Lambda_{di}$
		SOUTH FIELD		
Arsenic	200	9.77×10^{-7}	ND	9.77×10^{-7}
Beryllium	250	7.82×10^{-7}	ND	7.82×10^{-7}
Lead	38	5.13×10^{-6}	ND	5.13×10^{-6}
Cesium-137	1370	1.43×10^{-7}	2.62×10^{-6}	2.76×10^{-6}
Neptunium-237	5	3.82×10^{-5}	3.70×10^{-11}	3.82×10^{-5}
Plutonium-238	100	1.95×10^{-6}	9.02×10^{-7}	2.86×10^{-6}
Plutonium-239240	100	1.95×10^{-6}	3.28×10^{-9}	1.96×10^{-6}
Radium-226	106	1.84×10^{-6}	4.95×10^{-8}	1.89×10^{-6}
Radium-228	106	1.84×10^{-6}	1.37×10^{-5}	1.55×10^{-5}
Strontium-90	2.5	7.48×10^{-5}	2.77×10^{-6}	7.76×10^{-5}
Technetium-99	0.07	1.07×10^{-3}	3.71×10^{-10}	1.07×10^{-3}
Thorium-228	3200	6.11×10^{-8}	4.14×10^{-5}	4.15×10^{-5}
Thorium-230	3200	6.11×10^{-8}	1.03×10^{-9}	6.21×10^{-8}
Thorium-232	3200	6.11×10^{-8}	5.63×10^{-15}	6.11×10^{-8}
Thorium-Total	3200	6.11×10^{-8}	ND	6.11×10^{-8}
Uranium-234	1.48	1.23×10^{-4}	3.24×10^{-10}	1.23×10^{-4}
Uranium-235/236	1.48	1.23×10^{-4}	ND	1.23×10^{-4}
Uranium-238	1.48	1.23×10^{-4}	1.77×10^{-14}	1.23×10^{-4}
Aroclor-1254	1950	1.00×10^{-7}	ND	1.00×10^{-7}
Aroclor-1260	2350	8.23×10^{-8}	ND	8.32×10^{-8}
Dieldrin	5.75	3.34×10^{-5}	ND	3.34×10^{-5}
Benzo(a)anthracene	728	2.69×10^{-7}	1.00×10^{-5}	1.03×10^{-5}
Benzo(a)pyrene	1740	1.12×10^{-7}	1.00×10^{-5}	1.01×10^{-5}
Benzo(b)fluoranthene	6770	2.89×10^{-8}	1.20×10^{-5}	1.20×10^{-5}
Benzo(g,h,i)perylene	9880	1.98×10^{-8}	1.10×10^{-5}	1.10×10^{-5}
Benzo(k)fluoranthene	12600	1.55×10^{-8}	3.30×10^{-6}	3.32×10^{-6}
Dibenzo(a,h)anthracene	1700	1.15×10^{-7}	7.50×10^{-6}	7.62×10^{-6}
Indeno(1,2,3-cd)pyrene	83200	2.35×10^{-9}	1.00×10^{-5}	1.00×10^{-5}
Phenanthrene	0		3.60×10^{-5}	1.76×10^{-3}

TABLE B.2-5C
(Continued)

Parameter	K_d	$Lambda^{Li}$	$Lambda^{ri}$	$Lambda_{di}$
		SOLID WASTE LANDFILL		
Arsenic	200	9.77×10^{-7}	ND	9.77×10^{-7}
Beryllium	1300	1.50×10^{-7}	ND	1.50×10^{-7}
Lead	3000	6.52×10^{-8}	ND	6.52×10^{-8}
Neptunium-237	55	3.55×10^{-6}	3.70×10^{-11}	3.55×10^{-6}
Plutonium-238	1700	1.15×10^{-7}	9.02×10^{-7}	1.02×10^{-6}
Plutonium-239/240	1700	1.15×10^{-7}	3.28×10^{-9}	1.18×10^{-7}
Radium-226	696	2.81×10^{-7}	4.95×10^{-8}	3.30×10^{-7}
Radium-228	696	2.81×10^{-7}	1.37×10^{-5}	1.40×10^{-5}
Strontium-90	10	1.93×10^{-5}	2.77×10^{-6}	2.21×10^{-5}
Thorium-228	5800	3.37×10^{-8}	4.14×10^{-5}	4.14×10^{-5}
Thorium-230	5800	3.37×10^{-8}	1.03×10^{-9}	3.47×10^{-8}
Thorium-232	5800	3.37×10^{-8}	5.63×10^{15}	3.37×10^{-8}
Thorium-Total	5800	3.37×10^{-8}	ND	3.37×10^{-8}
Uranium-234	75	2.60×10^{-6}	3.24×10^{-10}	2.60×10^{-6}
Uranium-235/236	75	2.60×10^{-6}	ND	2.60×10^{-6}
Uranium-238	75	2.60×10^{-6}	1.77×10^{-14}	2.60×10^{-6}
Benzo(a)anthracene	2630	7.44×10^{-8}	1.00×10^{-5}	1.01×10^{-5}
Benzo(a)pyrene	6280	3.11×10^{-8}	1.00×10^{-5}	1.00×10^{-5}
Benzo(b)fluoranthene	24500	7.98×10^{-9}	1.20×10^{-5}	1.20×10^{-5}
Benzo(g,h,i)perylene	21300	9.18×10^{-9}	1.10×10^{-5}	1.10×10^{-5}
Dibenzo(a,h)anthracene	6140	3.18×10^{-8}	7.50×10^{-6}	7.53×10^{-6}
Indeno(1,2,3-cd)pyrene	301000	6.50×10^{-10}	1.00×10^{-5}	1.00×10^{-5}
Phenanthrene	9.54	2.03×10^{-5}	3.60×10^{-5}	5.63×10^{-5}

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t_{bd} = duration soil is exposed to airborne emissions (hr)

t_h = duration of period between harvest and consumption (hr)

Y = agricultural yield (g/m^2)

P = effective dry surface soil density (g/m^2)

The d_d term can be calculated by:

$$d_d = (C_{ia})(I)$$

where:

C_{ia} = concentration if i^{th} contaminant in air (pCi/m^3, rad) (mg/m^3, chem)

I = deposition rate $\left[\frac{m}{n}\right]$

In addition to being exposed to contaminated irrigation water and dust, vegetables, fruit, and livestock feed may be contaminated by root uptake from contaminated soil or waste. A contribution via this pathway is accounted for in the irrigation model; however, this pathway is also considered for areas that are not irrigated with contaminated water but that exhibit surface soil contamination from historical deposition on the soil by various means. The following equation can be used to calculate the constituent concentration in the plant from root uptake of constituents already in the soil (DOE 1992d):

$$C_{svi} = (C_{si})B_{iv(2)}e^{-\lambda_{di}t_h} \qquad \text{(B.2-12c)}$$

where:

C_{svi} = concentration of ith contaminant in food crops (pCi/g, rad) or (mg/kg, chem)

C_{si} = concentration of ith contaminant in soil (pCi/g, rad) or (mg/kg, chem)

$B_{iv(2)}$ = dry soil to dry plant partitioning coefficient of ith contaminant in food crops (C_{iv}/C_s)

λ_{di} = effective depletion constant of ith contaminat in surface soil due to radioactive decay, chemical depletion, and leaching (hr^{-1})

t_h = duration of period between harvest and consumption (hr^{-1})

The total concentration of contaminants in vegetables and fruit (C_{iv}) is calculated with the following equation:

$$(\text{radionuclides})C_{iv} = C_{vwi} + C_{avi} + C_{svi} \qquad \text{(B.2-13)}$$

$$(\text{chemicals})C_{iv} = C_{vwi} + C_{avi} + (C_{svi})(CF)$$

C_{iv}	=	Total concentration of ith contaminant in plant material (pCi/g, mg/kg)
C_{vwi}	=	Concentration of ith contaminant in plant as a result of irrigating plants with contaminated water (pCi/g, mg/g)
C_{avi}	=	Concentration of ith contaminant in plant as a result of aerial deposition (pCi/g, mg/g)
C_{svi}	=	Concentration of ith contaminant in plant as a result of root uptake from soils (pCi/g, mg/kg)
CF	=	Unit conversion factor (10^3 g/kg chemical only)

Once the concentration in vegetation has been determined, intake can be calculated with the following equations:

$$(\text{radionuclides})I_{iv} = (C_{iv})(CF)(IR)(ED)(EF)(FI) \qquad \text{(B.2-14)}$$

$$(\text{chemicals})I_{iv} = (C_{iv})(IR)(CF)(FI)(EF)(ED)/(BW)(AT) \qquad \text{(B.2-15)}$$

where:

I_{iv}	=	intake from vegetation (pCi) (mg/kg-day)
C_{iv}	=	total concentration of contaminants in vegetables or fruit (pCi/g) (mg/kg)
IR	=	ingestion rate (kg/day)
CF	=	conversion factor (1×10^3 kg/g)
FI	=	fraction ingested from contaminated source (unitless)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days); for noncarcinogens, AT equals (ED) (365 days/yr); for carcinogens, AT equals (70-year lifetime) (365 days/yr)

Equations of the same form are used to determine the contaminant concentration in livestock forage and feed, substituting factors for livestock feed in place of those for food crops. Once the contaminant concentrations in vegetables and livestock feed have been determined, intake can be estimated using the intake equations presented for ingestion of vegetables contaminated by irrigation and ingestion of animal products.

B.2.4.2.3 Ingestion of Animal Products

As in the quantification of intake following exposure to vegetables and fruits, the concentration in animal products must be estimated prior to the determination of intake. Beef and milk can become contaminated in three ways at this facility: the first way is through use of contaminated water as stock water; the second is by aerial deposition of contaminants on feed crops or forage; and the third is by direct ingestion of soil while grazing. Therefore, contaminant concentrations attributable to each contribution must be used to determine the total contaminant concentration in beef or milk.

Beef and Milk Products Produced with Contaminated Water

This scenario assumes that water is used for stock water and irrigation of feed. Animals drinking the water ingest contaminants directly. Plants irrigated with water take up constituents via root uptake and direct deposition onto exposed surfaces by irrigation water. If measured values are not available, this concentration can be calculated using the methodology set forth in the Risk Assessment Work Plan Addendum (DOE, 1992a). The concentration of a contaminant in animal products, such as beef or milk, is estimated using the following equation:

$$C_{Ai} = F_{Ai}[(C_{fi})(Q_f) + (C_{wi})(Q_w)]e^{-\lambda_n t_h} \qquad \text{(B.2-16)}$$

where:

C_{Ai} = concentration of ith contaminant in the animal product (pCi/L for milk, pCi/kg for beef, rad)(mg/L for milk, mg/kg for beef, chem)

C_{fi} = concentration of ith contaminant in feed (pCi/g, rad) (mg/g, chem)

C_{wi} = concentration of contaminant in water (pCi/L, rad)(mg/L, chem)

F_{Ai} = element (stable) transfer coefficient that relates the daily intake by an animal to the concentration of ith in an edible portion of the animal product (d/L for milk, d/kg for meat)

Q_f = consumption rate of contaminated feed by livestock (g/d)

Q_w = consumption rate of contaminated stock water by livestock (L/d)

λ_{ri} = radioactive or chemical decay constant of ith contaminant (hr^{-1})

t_h = duration of period between harvest and consumption (hr)

The concentration term C_{fi} can be calculated using the following equation:

$$C_{fi} = d_w \left[\frac{r_w(1-e^{-\lambda_{Ei}t_e})}{Y\lambda_{Ei}} + \frac{f_w B_{iv(l)}(1-e^{-\lambda_{di}t_{bw}})}{p\lambda_{di}} \right] e^{-\lambda_{ri}t_h} \qquad \text{(B.2-17a)}$$

where:

C_{fi} = concentration of ith contaminant in plants as a result of irrigating plants with contaminated water (pCi/g, rad)(mg/g,chem)

λ_{di} = effective depletion constant of ith contaminant in surface soils due to radioactive decay, chemical degradation, and leaching (hr^{-1})

λ_{Ei} = effective depletion constant of ith contaminant on the surface plants also known as the weathering removed rate (hr^{-1})

λ_{ri} = radioactive depletion constant of ith contaminant (hr^{-1})

$B_{iv(l)}$ = dry soil to dry plant partitioning coefficient of ith contaminant (C_{iw}/C_s) in animal feed

d_w = irrigation deposition rate (pCi/m^2-h, rad) or (mg/m^2-h, chem)

p = effective dry surface density of the soil (g/m^2)

f_w = fraction of year plant is irrigated (unitless)

r_w = fraction of waterborne material retained on plant surface (unitless)

t_e = growing season (hr)

t_{bw} = duration of irrigation use (hr)

t_h = duration of period between harvest and consumption (hr)

Y = agricultural yield (g/m^2)

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$$C_{vwi} = d_d \left[\frac{r_d(1-e^{-\lambda_{ei}t_e})}{Y\lambda_{Ei}} + \frac{f_d B_{iv(1)}(1-e^{-\lambda_{di}t_{bw}})}{p\lambda_{di}} \right] e^{-\lambda_{ri}t_h} \qquad \text{(B.2-17b)}$$

where:

C_{vwi}	=	concentration of ith contaminant in plants as a result of (pCi/g, rad)(mg/g,chem)
λ_{di}	=	effective depletion constant of ith contaminant in surface soils due to radioactive decay, chemical degradation, and leaching (hr^{-1})
λ_{ei}	=	effective depletion constant if i^{th} contaminant on the surface of the plant, also known as the weathering removal rate (hr^{-1})
λ_{ri}	=	radioactive depletion constant of ith contaminant (hr^{-1})
$B_{iv(1)}$	=	dry soil to dry plant partitioning coefficient of ith contaminant (C_{iw}/C_s) in animal feed
d_w	=	aerial deposition rate (pCi/m^2-h, rad) or (mg/m^2-h, chem)
f_d	=	fraction of year plant is down wind (unitless)
p	=	effective dry surface density of the soil (g/m^2)
r_d	=	fraction of air borne material retained on plant surface (unitless)
t_e	=	growing season (hr)
t_{bw}	=	duration of irrigation use (hr)
t_h	=	duration of period between harvest and consumption (hr)
Y	=	agricultural yield (g/m^2)

Beef and Dairy Products Contaminated by Aerial Deposition

Forage, feed, and soils downwind of a potential source of contaminated dust can have contamination deposited on them by settling dust. Ingestion of these plants by livestock contributes to the body burden of these contaminants in livestock. Consumption of meat or milk from these animals contributes to the total intake of these contaminants by humans. The magnitude of the contaminant exposure by humans depends, in part, on the concentration of the constituent in the animal products.

If measured values are not available, this concentration of a contaminant in animal products, such as beef or milk, is estimated using the following equation:

$$(\text{radionuclides})C_{Ai} = F_{Ai}\,[(C_{afi})(Q_f) + (C_{asi})(Q_g) + (C_{asi})(Q_s)]\; e^{-\lambda_{ri} t_h} \qquad \text{(B.2-18)}$$

$$(\text{chemicals})C_{Ai} = F_{Ai}\,[(C_{afi})(Q_f) + (C_{asi})(Q_g) + (C_{asi})(Q_s)(CF)]\; e^{-\lambda_{ri} t_h} \qquad \text{(B.2-18)}$$

C_{Ai}	=	concentration of ith contaminant in the animal product (pCi/L for milk, pCi/kg for beef, rad)(mg/L for milk, mg/kg for beef, chem)
C_{afi}	=	concentration of ith contaminant in feed (pCi/g, rad) (mg/g, chem)
C_{agi}	=	concentration of contaminant in forage (pCi/g, rad)(mg/g, chem)
C_{asi}	=	concentration of ith contaminant in soil (pCi/g, rad)(mg/kg, chem)
CF	=	unit conversion factor (1×10^3 g/kg,chem)
F_{Ai}	=	element (stable) transfer coefficient that relates the daily intake by an animal to the concentration of ith in an edible portion of the animal product (d/L for milk, d/kg for meat)
Q_f	=	consumption rate of contaminated feed by livestock (g/d)
Q_g	=	consumption rate of contaminated forage by livestock (g/d)
Q_s	=	consumption rate of contaminated soil by livestock (g/d, rad)(g/d, chem)
λ_{ri}	=	radioactive or chemical decay constant of ith contaminant (hr^{-1})
t_h	=	duration of period between harvest and consumption (hr)

To calculate C_{afi} or C_{agi} equation B.2-18 is used. To estimate C_{asi} the following equation is used:

$$C_{asi} = d_d \left[\frac{f_d(1 - e^{-\lambda_{di} t_{ei}})}{p\lambda_{di}}\right] e^{-\lambda_{ri} t_h} \qquad \text{(B.2-19)}$$

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Beef and Milk Products Grown in Contaminated Soil

Forage and feed grown in contaminated soils are effected by the soil concentration via uptake through the root system. Hence, ingestion of these plants contributes to the body burden of these contaminants in livestock. Meat or milk consumed from these animals adds to the total intake of these contaminants by humans. The concentration of contaminants in beef or milk is estimated using the following equation:

$$(\text{radionuclides})C_{Ai} = F_{Ai}\,[(C_{fi})(Q_f) + (C_{gi})(Q_g) + (C_{Si})(Q_s)]\; e^{-\lambda_{ri} t_h} \qquad \text{(B.2-20)}$$

$$(\text{chemicals})C_{Ai} = F_{Ai}\,[(C_{fi})(Q_f)(CF) + (C_{gi})(Q_g)(CF) + (C_{Si})(Q_s)(CF)]\; e^{-\lambda_{ri} t_h} \qquad \text{(B.2-20)}$$

where:

C_{Ai}	=	concentration of ith contaminant in the animal product, (pCi/L for milk, pCi/kg for beef, rad) or (mg/L for milk, mg/kg for beef, chem)
C_{si}	=	concentration of ith contaminant in soil (pCi/g, rad) or (mg/kg, chem)
C_{gi}	=	concentration of ith contaminant in forage (pCi/g, rad)or (mg/kg, chem)
C_{fi}	=	concentration of ith contaminant in feed (pCi/g,rad)(mg/kg,chem)
F_{Ai}	=	element (stable) transfer coefficient that relates the daily intake by an animal to the concentration of ith in an edible portion of the animal product (d/L for milk, d/kg for meat)
CF	=	unit conversion factor (1×10^3 g/kg,chem)
Q_f	=	consumption rate of contaminated feed by livestock (g/d)
Q_g	=	consumption rate of contaminated forage by livestock (g/d)
Q_s	=	consumption rate of contaminated soil by livestock (g/d)
λ_{ri}	=	radioactive or chemical decay constant of ith contaminant (hr^{-1})
t_h	=	duration of period between harvest and consumption (hr)

C_{gi} and C_{fi} can be calculated using the following equation:

where:

$$C_{a(p)i} = (C_{si})B_{iv(1)}e^{-\lambda_{ri}t_h}$$

$C_{a(p)i}$	=	concentration of ith contaminant in the plant, where p = g is forage, and p=f is stored feed (pCi/g, rad)(mg/kg, chem)
C_{si}	=	concentration of ith contaminant in soil (pCi/g, rad)(mg/kg, chem)
$B_{iv(1)}$	=	dry soil to dry plant partitioning coefficient of ith contaminant if forage (C_{sgi}/C_{si})
λ_{ri}	=	radioactive or chemical decay constant of ith contaminant (hr^{-1})
t_h	=	duration of period between harvest and consumption (hr)

Once the concentration in the animal product (beef or milk) is determined, human intake can be calculated using the following equations:

$$(\text{radionuclides})I_{Ai} = (C_{Ai})(IR)(ED)(EF)(FI) \quad \text{(B.2-21)}$$

$$(\text{chemicals})I_{Ai} = (C_{Ai})(IR)(FI)(EF)(ED)/(BW)(AT) \quad \text{(B.2-22)}$$

where:

I_{Ai}	=	intake of chemical in animal product (pCi) (mg/kg-day)
C_{Ai}	=	concentration of ith contaminant in the animal product (pCi/L for milk, pCi/kg for beef) (mg/L for milk, mg/kg for beef)
IR	=	ingestion rate (L/day for milk; kg/day for beef)
FI	=	fractional intake (unitless)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days); for noncarcinogens, AT equals (ED) (365 days/yr); for carcinogens, AT equals (70-year lifetime) (365 days/yr)

Animal Consumption Rates

The following parameters were used to quantify the intake of contaminants in food and water by beef and milk cattle at or near the FEMP:

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Animal	Q_f Feed or Forage [a] (kg wet weight/day)	Q_{Aw} Water [a] (1/day)	Q_a Soil[b] (kg/day)
Milk cow	50000	60	500
modified[c]	25000		
Beef cattle	50000	50	500
modified[c]	25000		

[a]NCR 1977

[b]Zach and Mayoh 1984

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Modified assuming that pastureland is not irrigated due to the cost involved and based on data from the Bureau of Census (Bureau of Census 1989). Pasture forage is assumed to be supplemented with stored feed that was irrigated with contaminated water, and the animal diet consists of equal parts of pasture grass and stored feed totaling 50 kg/day wet weight.

B.2.4.2.4 Dermal Contact with Water or Soil

Estimating the intake of a constituent via dermal contact with water can be achieved by using the concentration of the constituent in water. The amount of a chemical taken into the body upon exposure via dermal contact is referred to as an absorbed dose and is calculated using the following equation (EPA 1992f):

$$\text{Absorbed dose (mg/kg-day)} = \frac{(SA)\ (DA)\ (EF)\ (ED)}{(BW)\ (AT)}$$

The DA factor can be calculated as follows:

$$\text{If ET} < t^*,\ DA = 2K_p \times C_w \times CF[6(TAO)(ET)/3.14]^{0.5}$$
$$\text{If ET} > t^*,\ DA = K_p x\ C_w[(ET/1+B) + 2TAO(1+3B/1+B)]$$

where:

DA	=	dermally absorbed dose from contact with water (mg/cm^2-day)
K_p	=	permeability coefficient from water (cm/hr)
C_w	=	contaminant concentration in water (mg/cm^3)
CF	=	conversion factor
TAO	=	lag time (hr/day)
ET	=	exposure time (hr/day); bathing - 0.5; swimming - 2.6; surface water - 1

t*	=	time to steady-state conditions
B	=	partition coefficient (unitless)
SA	=	skin surface area available for contact (cm^2)
EF	=	exposure frequency (day/year)
ED	=	exposure duration
BW	=	body weight
AT	=	averaging time (days); for noncarcinogens, AT equals (ED) (365 days/year); for carcinogens, AT equals (70-year lifetime) (365 days/year)

The term DA was calculated per EPA (1992f), Section 5.3. DA is a function of K_p (Table B.2-6A), the water permeability coefficient of each constituent. Values for DA are presented in Table B.2-6B.

Dermal absorption may also occur upon contact with contaminated soil and sediment and is calculated using the following equation (EPA 1989a):

$$AB_s = (C_s)(SA)(CF)(AF)(ABS)(ED)(EF)/(BW)(AT) \quad \text{(B.2-23)}$$

where:

AB_s	=	absorbed dose from contact with soil (mg/kg-day)
C_s	=	concentration in soil (mg/kg)
SA	=	skin surface area available for contact (cm^2/day)
AF	=	skin adherence factor (mg/cm^2)
ABS	=	absorption factor (unitless)
CF	=	conversion factor, 10^{-6} (kg/mg)
ED	=	exposure duration (yr)
EF	=	exposure frequency (day/year)
BW	=	body weight (kg)
AT	=	averaging time (days); for noncarcinogens, AT equals (ED) (365 days/yr); for carcinogens, AT equals (70-year lifetime) (365 days/yr)

Soil dermal absorption coefficients are presented in Tables B.2-6A and B.2-6C.

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TABLE B.2-6A

DERMAL ABSORPTION DOSE CHEMICAL SPECIFIC VALUES FOR DA EQUATIONS

Parameter	K_p (cm/hr)[a]	TAO (hr)	t* (hr)	B	K_{ow}[b]
RADIOLOGICAL					
Thorium-total	1.0×10^{-3}	NA	NA	NA	NA
Uranium-total	1.0×10^{-3}	NA	NA	NA	NA
INORGANICS					
Antimony	1.0×10^{-3}	NA	NA	NA	NA
Arsenic	1.0×10^{-3}	NA	NA	NA	NA
Barium	1.0×10^{-3}	NA	NA	NA	NA
Beryllium	1.0×10^{-3}	NA	NA	NA	NA
Cadmium (food)	1.0×10^{-3}	NA	NA	NA	NA
Cyanide	1.0×10^{-3}	NA	NA	NA	NA
Lead	$4.0 \times 10^{+6}$	NA	NA	NA	NA
Manganese	1.0×10^{-3}	NA	NA	NA	NA
Nickel	1.0×10^{-3}	NA	NA	NA	NA
Selenium	1.0×10^{-3}	NA	NA	NA	NA
Thallium	1.0×10^{-3}	NA	NA	NA	NA
VOLATILE ORGANICS					
1,1,2-Trichlorotrifluoroethane[c]	4.76×10^{-3}	$1.22 \times 10^{+0}$	$2.43 \times 10^{+0}$	1.48×10^{-2}	$1.48 \times 10^{+2}$
1,2-Diethylbenzene[c]		5.76×10^{-1}		$0.00 \times 10^{+0}$	
1,4-Dioxane	3.60×10^{-4}	3.02×10^{-1}	7.20×10^{-1}	5.40×10^{-5}	3.80×10^{-1}
Acrylonitrile	1.40×10^{-3}	1.84×10^{-1}	4.40×10^{-1}	1.80×10^{-4}	$1.70 \times 10^{+0}$
SEMIVOLATILE ORGANICS					
2-Methylnaphthalene[c]	1.42×10^{-1}	6.45×10^{-0}	$4.87 \times 10^{+0}$	7.24×10^{-1}	$7.24 \times 10^{+3}$
4-Methylphenol[c]	9.33×10^{-3}	3.99×10^{-1}	7.97×10^{-1}	7.94×10^{-3}	$7.94 \times 10^{+1}$
Benzo(a)anthracene	8.10×10^{-1}	$2.15 \times 10^{+0}$	$1.02 \times 10^{+1}$	$4.57 \times 10^{+1}$	$4.57 \times 10^{+5}$
Benzo(a)pyrene	$1.20 \times 10^{+0}$	$2.90 \times 10^{+0}$	$1.42 \times 10^{+1}$	$1.26 \times 10^{+2}$	$1.26 \times 10^{+6}$
Benzo(b)fluoranthene	$1.20 \times 10^{+0}$	$3.01 \times 10^{+0}$	$1.42 \times 10^{+1}$	$1.32 \times 10^{+2}$	$1.32 \times 10^{+6}$
Benzo(g,h,i)pyrene[c]	$5.37 \times 10^{+0}$	$4.22 \times 10^{+0}$	$1.99 \times 10^{+1}$	$1.70 \times 10^{+3}$	$1.70 \times 10^{+7}$
Benzo(k)fluoranthene[c]	$3.97 \times 10^{+0}$	$3.01 \times 10^{+0}$	$1.42 \times 10^{+1}$	$6.92 \times 10^{+2}$	$6.92 \times 10^{+6}$

See footnotes at end of table

TABLE B.2-6A
(Continued)

Parameter	K_p (cm/hr)[a]	TAO (hr)	t* (hr)	B	K_{ow}[b]
SEMIVOLATILE ORGANICS (Continued)					
Bis(2-ethylhexyl)phthalate[c]	6.23×10^{-3}	$2.11 \times 10^{+1}$	$4.22 \times 10^{+1}$	5.30×10^{-4}	$5.30 \times 10^{+0}$
Carbazole[c]	3.94×10^{-2}	9.16×10^{-1}	$3.79 \times 10^{+0}$	1.95×10^{-1}	$1.95 \times 10^{+3}$
Dibenzo(a,h)anthracene	$2.70 \times 10^{+0}$	$4.34 \times 10^{+0}$	$2.05 \times 10^{+1}$	$6.92 \times 10^{+2}$	$6.92 \times 10^{+6}$
Indeno(1,2,3-cd)pyrene	$1.90 \times 10^{+0}$	$4.22 \times 10^{+0}$	$1.99 \times 10^{+1}$	$3.80 \times 10^{+2}$	$3.80 \times 10^{+6}$
Phenanthrene	2.30×10^{-1}	$1.07 \times 10^{+0}$	$5.60 \times 10^{+0}$	$2.90 \times 10^{+0}$	$3.72 \times 10^{+4}$
Tributyl phosphate[c]	3.14×10^{-2}	$3.67 \times 10^{+0}$	$3.08 \times 10^{+1}$	$1.00 \times 10^{+0}$	$1.00 \times 10^{+4}$
PESTICIDE/PCBS					
Aroclor-1254[c]	6.19×10^{-1}	$5.14 \times 10^{+0}$	$2.43 \times 10^{+1}$	$1.07 \times 10^{+2}$	$1.07 \times 10^{+6}$
Aroclor-1260[c]	$3.84 \times 10^{+0}$	$5.14 \times 10^{+0}$	$2.42 \times 10^{+1}$	$1.40 \times 10^{+3}$	$1.40 \times 10^{+7}$
Dieldrin	1.60×10^{-2}	$1.84 \times 10^{+1}$	$3.68 \times 10^{+1}$	4.56×10^{-4}	$4.56 \times 10^{+0}$
Heptachlorodibenzo-p-dioxin[c]	$8.69 \times 10^{+0}$	$8.05 \times 10^{+0}$	$3.80 \times 10^{+1}$	$8.32 \times 10^{+3}$	$8.32 \times 10^{+7}$
Heptchlorodibenzofuran[c]	$1.37 \times 10^{+0}$	$8.05 \times 10^{+0}$	$3.80 \times 10^{+1}$	$1.58 \times 10^{+4}$	$1.58 \times 10^{+8}$
Octachlorodibenzo-p-dioxin[c]	$2.64 \times 10^{+0}$	$8.05 \times 10^{+0}$	$3.80 \times 10^{+1}$	$3.98 \times 10^{+4}$	$3.98 \times 10^{+8}$
Tetrachlorodibenzofuran[c]	$4.60 \times 10^{+0}$	$3.80 \times 10^{+1}$	$3.40 \times 10^{+3}$	$3.40 \times 10^{+3}$	$3.40 \times 10^{+7}$

[a]EPA 1992f, the default value for inorganics is 1.0×10^{-3}, the experimental value for cadmium. Organic K_ps were estimated using the regression equation: $\text{Log } K_p = 02.72 + 0.71 \text{ Log } K_{ow} - 0.0061 \text{ MW}$.

[b]EPA 1992f, "Dermal Exposure Assessment: Principles and Applications." K_{ow}s calculated from this guidance.

[c]Parameters (K_p, TAU, t*, and B) calculated using appropriate equations in the dermal exposure assessment, EPA 1992f.

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Table B.2-6b
Dermal Absorbed Dose Summary

		South Field								Inactive Flyash Pile							
		On-Subunit				Off-Subunit			Modeled Background	On-subunit				Off-subunit			Modeled Background
Media	Parameter	CPC Conc.	Bathing	Swimming	Surface Water	CPC Conc.	Bathing	Swimming	CPC Conc.	Bathing	CPC Conc.	Bathing	Swimming	Surface Water	CPC Conc.	Bathing	Swimming	CPC Conc.	Bathing
Groundwater																			
	Arsenic	NA				NA			NA		NA				NA			NA	
	Beryllium	NA				NA			NA		NA				NA			NA	
	Lead	1.43E-03	1.43E-09			2.05E-17	2.05E-23		6.42E-05	6.42E-11	1.43E-03	1.43E-09			2.05E-17	2.05E-23		6.42E-05	6.42E-11
	Uranium	1.84E+00	4.60E-04			9.45E-02	2.36E-05		5.36E-04	1.34E-07	1.84E+00	4.60E-04			9.45E-02	2.36E-05		5.36E-04	1.34E-07
	2-Methylnaphthalene	7.17E-04	1.41E-07			NA			NA		7.17E-04	1.41E-07			NA			NA	
	Tributyl phosphate	1.43E-03	6.21E-08			NA			NA		1.43E-03	6.21E-08			NA			NA	
Perched Groundwater																			
	Arsenic	NA				NA			NA		NA				NA			NA	
	1,1,2Trichlorotrifluoroetha	NA				NA			NA		NA				NA			NA	
	1,2-diethylbenzene	NA				NA			NA		NA				NA			NA	
	2-Methylnaphthalene	NA				NA			NA		NA				NA			NA	
	Carbazole	NA				NA			NA		NA				NA			NA	
	Endosulfan sulfate	NA				NA			NA		NA				NA			NA	
Great Miami River																			
	Arsenic	2.08E-08	5.20E-12	5.41E-11		2.08E-08	5.20E-12	5.41E-11	NA		1.59E-08	3.98E-12	4.13E-11		1.59E-08	3.98E-12	4.13E-11	NA	
	Beryllium	2.15E-09	5.38E-13	5.59E-12		2.15E-09	5.38E-13	5.59E-12	NA		7.64E-10	1.91E-13	1.99E-12		7.64E-10	1.91E-13	1.99E-12	NA	
	Cadmium	NA				NA			NA		2.36E-08	5.90E-12	6.14E-11		2.36E-08	5.90E-12	6.14E-11	NA	
	Lead	3.69E-07	3.69E-13	3.84E-12		3.69E-07	3.69E-13	3.84E-12	NA		6.40E-08	6.40E-14	6.66E-13		6.40E-08	6.40E-14	6.66E-13	NA	
	Nickel	2.44E-08	6.10E-12	6.34E-11		2.44E-08	6.10E-12	6.34E-11	NA		1.08E-08	2.70E-12	2.81E-11		1.08E-08	2.70E-12	2.81E-11	NA	
	Uranium	1.39E-05	3.48E-09	3.61E-08		1.39E-05	3.48E-09	3.61E-08	NA		2.44E-06	6.10E-10	6.34E-09		2.44E-06	6.10E-10	6.34E-09	NA	
	2-Methylnaphthalene	NA				NA			NA		1.54E-08	3.03E-12	9.76E-12		1.54E-08	3.03E-12	9.76E-12	NA	
	Benzo(a)anthracene	4.32E-09				4.32E-09			NA		NA				NA			NA	
	Benzo(a)pyrene	3.09E-09				3.09E-09			NA		NA				NA			NA	
	Benzo(b)fluoranthene	5.24E-10				5.24E-10			NA		NA				NA			NA	
	Benzo(g,h,i)perylene	1.48E-08				1.48E-08			NA		NA				NA			NA	
	bis(2-Ethylhexyl) phthalate	3.45E-08				3.45E-08			NA		NA				NA			NA	
	Dibenzo(a,h)anthracene	6.39E-10				6.39E-10			NA		1.09E-10	4.07E-13	1.31E-12		1.09E-10	4.07E-13	1.31E-12	NA	
	Phenanthrene	4.61E-06				4.61E-06			NA		NA				NA			NA	
	Dieldrin	9.50E-10				9.50E-10			NA		NA				NA			NA	
Surface Water																			
	Arsenic	6.84E-04			6.84E-07	NA			NA		3.23E-03			3.23E-06	NA			NA	
	Beryllium	7.09E-05			7.09E-08	NA			NA		1.56E-04			1.56E-07	NA			NA	
	Lead	1.22E-02			4.88E-08	NA			NA		1.30E-02			5.20E-08	NA			NA	
	Uranium	4.64E-01			4.64E-04	NA			NA		4.96E-01			4.96E-04	NA			NA	
	2-Methylnaphthalene	NA				NA			NA		3.15E-03			1.24E-06	NA			NA	
	Benzo(a)anthracene	1.42E-04				NA			NA		NA				NA			NA	
	Benzo(a)pyrene	1.02E-04				NA			NA		NA				NA			NA	
	Benzo(b)fluoranthene	1.72E-05				NA			NA		NA				NA			NA	
	Benzo(g,h,i)perylene	4.87E-04				NA			NA		NA				NA			NA	
	Dibenzo(a,h)anthracene	2.10E-05				NA			NA		2.22E-05			1.66E-07	NA			NA	
	Phenanthrene	1.51E-01				NA			NA		NA				NA			NA	
	Dieldrin	3.13E-05				NA			NA		NA				NA			NA	

NA - CPC is not applicable to this subunit
ND - Kp data was unavailable at time of report preparation

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Table B.2-6b
Dermal Absorbed Dose Summary

		Active Flyash Pile									Solid Waste Landfill							Lime Sludge Pond			
		On-subunit				Off-subunit			Modeled Background		On-Subunit				Off-subunit			On-Subunit			
Media	Parameter	CPC Conc.	Bathing	Swimming	Surface Water	CPC Conc.	Bathing	Swimming	CPC Conc.	Bathing	CPC Conc.	Bathing	Swimmin	Surface Water	CPC Conc.	Bathing	Swimming	CPC Conc.	Bathing	Swimmin	Surface Water
Groundwater																					
	Arsenic	1.84E-13	4.60E-17			7.46E-08	1.87E-11		NA		NA				NA			NA			
	Beryllium	1.82E-15	4.55E-19			1.40E-09	3.50E-13		NA		NA				NA			NA			
	Lead	2.06E-09	2.06E-15			5.82E-06	5.82E-12		4.87E-13	4.87E-19	NA				NA			NA			
	Uranium	7.76E-02	1.94E-05			1.02E-02	2.55E-06		1.07E-02	2.68E-06	NA				NA			NA			
	2-Methylnaphthalene	1.95E-03	3.83E-07			NA			NA		NA				NA			NA			
	Tributyl phosphate	NA				NA			NA		NA				NA			NA			
Perched Groundwater																					
	Arsenic	NA				NA			NA		NA				NA			1.45E-05	3.63E-09		
	1,1,2Trichlorotrifluoroetha	NA				NA			NA		NA				NA			1.66E-04	8.19E-06		
	1,2-diethylbenzene	NA				NA			NA		NA				NA			1.00E-07	3.19E-09		
	2-Methylnaphthalene	NA				NA			NA		7.76E-07	1.53E-10			NA			NA			
	Carbazole	NA				NA			NA		9.61E-03	5.24E-07			NA			NA			
	Endosulfan sulfate	NA				NA			NA		2.00E-04	ND			NA			NA			
Great Miami River																					
	Arsenic	1.60E-07	4.00E-11	4.16E-10		1.60E-07	4.00E-11	4.16E-10	NA		2.31E-09	5.78E-13	6.01E-12		2.31E-09	5.78E-13	6.01E-12	NA			
	Beryllium	NA				NA			NA		3.72E-11	9.30E-15	9.67E-14		3.72E-11	9.30E-15	9.67E-14	NA			
	Cadmium	NA				NA			NA		NA				NA			NA			
	Lead	5.15E-07	5.15E-13	5.36E-12		5.15E-07	5.15E-13	5.36E-12	NA		4.38E-10	4.38E-16	4.56E-15		4.38E-10	4.38E-16	4.56E-15	NA			
	Nickel	NA				NA			NA		NA				NA			NA			
	Uranium	NA				NA			NA		2.07E-07	5.18E-11	5.38E-10		2.07E-07	5.18E-11	5.38E-10	NA			
	2-Methylnaphthalene	NA				NA			NA		NA				NA			NA			
	Benzo(a)anthracene	NA				NA			NA		9.63E-12	1.08E-14	3.48E-14		9.63E-12	1.08E-14	3.48E-14	NA			
	Benzo(a)pyrene	NA				NA			NA		3.75E-12	6.22E-15	2.01E-14		3.75E-12	6.22E-15	2.01E-14	NA			
	Benzo(b)fluoranthene	NA				NA			NA		NA				NA			NA			
	Benzo(g,h,i)perylene	NA				NA			NA		1.62E-12	1.20E-14	3.88E-14		1.62E-12	1.20E-14	3.88E-14	NA			
	bis(2-Ethylhexyl) phthalate	NA				NA			NA		NA				NA			NA			
	Dibenzo(a,h)anthracene	NA				NA			NA		2.25E-12	8.40E-15	2.71E-14		2.25E-12	8.40E-15	2.71E-14	NA			
	Phenanthrene	NA				NA			NA		1.57E-07	4.99E-11	1.61E-10		1.57E-07	4.99E-11	1.61E-10	NA			
	Dieldrin	NA				NA			NA		NA				NA			NA			
Surface Water																					
	Arsenic	1.06E-02			1.06E-05				NA		8.09E-04			8.09E-07	NA			NA			
	Beryllium	4.41E-04			4.41E-07				NA		1.30E-05			1.30E-08	NA			NA			
	Lead	3.40E-02			1.36E-07				NA		1.54E-04			6.16E-10	NA			NA			
	Uranium	NA			NA				NA		7.27E-02			7.27E-05	NA			NA			
	2-Methylnaphthalene	NA			NA				NA		NA				NA			NA			
	Benzo(a)anthracene	NA			NA				NA		3.38E-06			7.57E-09	NA			NA			
	Benzo(a)pyrene	NA			NA				NA		1.31E-06			4.35E-09	NA			NA			
	Benzo(b)fluoranthene	NA			NA				NA		NA				NA			NA			
	Benzo(g,h,i)perylene	NA			NA				NA		5.69E-07			8.45E-09	NA			NA			
	Dibenzo(a,h)anthracene	NA			NA				NA		7.90E-07			5.90E-09	NA			NA			
	Phenanthrene	NA			NA				NA		5.52E-02			3.51E-05	NA			NA			
	Dieldrin	NA			NA				NA		NA				NA			NA			

NA - CPC is not applicable to this subunit
ND - Kp data was unavailable at time of report preparation

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TABLE B.2-6C

DERMAL ABSORPTION DOSE CHEMICAL SPECIFIC VALUES USED IN EXPOSURE MODEL

Parameter	K_p (cm/hr)	Soil Absorption Coefficient (unitless)	TOA (hr)	t* (hr)
RADIOLOGICAL				
Thorium-total	1.0×10^{-3}	1.00×10^{-2b}		
Uranium-total	1.0×10^{-3}	1.00×10^{-2a}		
INORGANICS				
Antimony	1.0×10^{-3}	1.00×10^{-2a}		
Arsenic	1.0×10^{-3}	1.00×10^{-3b}		
Barium	1.0×10^{-3}	1.00×10^{-3b}		
Beryllium	1.0×10^{-3}	1.00×10^{-2b}		
Cadmium (food)	1.0×10^{-3}	1.00×10^{-2a}		
Manganese	1.0×10^{-3}	1.00×10^{-2b}		
Nickel	1.0×10^{-3}	1.00×10^{-4c}		
Selenium	1.0×10^{-3}	1.00×10^{-2b}		
Cyanide	1.0×10^{-3}	1.00×10^{-2a}		
Lead	1.0×10^{-3}	1.00×10^{-2a}		
Thallium	1.0×10^{-3}	1.00×10^{-2a}		
VOLATILE ORGANICS				
1,1,2-Trichlorotrifluoroethane	4.76×10^{-3}	3.00×10^{-1b}	$1.22 \times 10^{+0}$	$2.43 \times 10^{+0}$
1,2-Diethylbenzene		3.00×10^{-1b}	5.76×10^{-1}	
1,4-Dioxane	3.60×10^{-4}	3.00×10^{-1b}	3.02×10^{-1}	6.04×10^{-1}
Acrylonitrile	1.40×10^{-3}	3.00×10^{-1b}	1.84×10^{-1}	3.69×10^{-1}
SEMIVOLATILE ORGANICS				
2-Methylnaphthalene	1.42×10^{-1}	3.00×10^{-1b}	6.45×10^{-0}	$4.87 \times 10^{+0}$
4-Methylphenol	9.33×10^{-3}	3.00×10^{-1b}	3.99×10^{-1}	7.97×10^{-1}
Benzo(a)anthracene	8.10×10^{-1}	3.00×10^{-1b}	$2.15 \times 10^{+0}$	$1.02 \times 10^{+1}$
Benzo(a)pyrene	$1.20 \times 10^{+0}$	3.00×10^{-1b}	$3.01 \times 10^{+0}$	$1.42 \times 10^{+1}$
Benzo(b)fluoranthene	$1.20 \times 10^{+0}$	3.00×10^{-1b}	$3.01 \times 10^{+0}$	$1.42 \times 10^{+1}$
Benzo(g,h,i)perylene	$5.37 \times 10^{+0}$	3.00×10^{-1b}	$4.22 \times 10^{+0}$	$1.99 \times 10^{+1}$
Benzo(k)fluoranthene	$3.97 \times 10^{+0}$	3.00×10^{-1b}	$3.01 \times 10^{+0}$	$1.42 \times 10^{+1}$

See footnotes at end of table

TABLE B.2-6C
(Continued)

Parameter	K_p (cm/hr)	Soil Absorption Coefficient (unitless)	TOA (hr)	t* (hr)
SEMIVOLATILE ORGANICS (Continued)				
Bis(2-ethylhexyl)phthalate	6.23×10^{-3}	4.00×10^{-3}[b]	$2.11 \times 10^{+1}$	$4.22 \times 10^{+1}$
Carbazole	3.94×10^{-2}	3.00×10^{-1}[b]	9.16×10^{-1}	$3.79 \times 10^{+0}$
Dibenzo(a,h)anthracene	$2.70 \times 10^{+0}$	3.00×10^{-1}[b]	$4.34 \times 10^{+0}$	$2.05 \times 10^{+1}$
Indeno(1,2,3-cd)pyrene	$1.90 \times 10^{+0}$	3.00×10^{-1}[b]	$4.22 \times 10^{+0}$	$1.99 \times 10^{+1}$
Phenanthrene	2.30×10^{-1}	3.00×10^{-1}[b]	$1.07 \times 10^{+0}$	$5.41 \times 10^{+0}$
Tributyl phosphate	3.14×10^{-2}	3.00×10^{-1}[b]	$3.67 \times 10^{+0}$	$3.08 \times 10^{+1}$
PESTICIDE/PCBS				
Aroclor-1254	6.19×10^{-1}	6.00×10^{-2}[b]	$5.14 \times 10^{+0}$	$2.43 \times 10^{+1}$
Aroclor-1260	$3.84 \times 10^{+0}$	6.00×10^{-2}[b]	$5.14 \times 10^{+0}$	$2.42 \times 10^{+1}$
Dieldrin	1.60×10^{-2}	6.00×10^{-2}[b]	$1.84 \times 10^{+1}$	$3.68 \times 10^{+1}$
Heptachlorodibenzo-p-dioxin	$8.69 \times 10^{+0}$	3.00×10^{-2}[b]	$8.05 \times 10^{+0}$	$3.80 \times 10^{+1}$
Heptchlorodibenzofuran	$1.37 \times 10^{+0}$	3.00×10^{-2}[b]	$8.05 \times 10^{+0}$	$3.80 \times 10^{+1}$
Octachlorodibenzo-p-dioxin	$2.64 \times 10^{+0}$	3.00×10^{-2}[b]	$8.05 \times 10^{+0}$	$3.80 \times 10^{+1}$
Octachlorodibenzofuran		3.00×10^{-2}[b]	$3.67 \times 10^{+0}$	$3.67 \times 10^{+0}$
Tetrachlorodibenzo-p-dioxin		3.00×10^{-2}[b]		
Tetrachlorodibenzofuran	$4.60 \times 10^{+0}$	3.00×10^{-2}[b]	$3.80 \times 10^{+1}$	$3.40 \times 10^{+3}$

[a]Wester et al. (1991).

[b]EPA 1993a, Memorandum from ECAO to EPA Region V, 7/21/93, including Attachments 1-6.

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Dermal Exposures to PAHs

Reliable cancer slope factors for dermal exposure to polycyclic hydrocarbons (PAHs) are currently unavailable. Current policy indicates it is inappropriate to extrapolate dermal slope factors from oral slope factors for PAHs. Also, extrapolation from other routes of exposure is inappropriate due to varied absorption, metabolic transformations, and target organ end point responses. However, PAHs are potent skin carcinogens. Current information on the contribution to cancer risk from dermal exposure to PAHs indicates the toxicity from the dermal pathway may be as toxic as from oral route of exposure. In order to provide an estimate of the risk contribution from PAHs via dermal exposure for all direct contact pathways, the risk posed for dermal exposure was assumed equal to the risk from oral exposure.

Body Surface Area for Dermal Exposure

The 95th percentile body surface area value of $2.3m^2$, recommended by EPA, was the physiological parameter used for the human body surface area during calculation of dermal exposures for all risk assessments. However, this value is currently being re-evaluated by EPA, but until a determination can be reached, the 95th percentile body surface area value will be used.

B.2.4.2.5 Inhalation Of Gases and Particulates

The equations used to quantify intake from the inhalation pathway adapted from EPA (EPA 1989a) are:

$$(\text{radionuclides})I_a = (C_a)(IR)(ED)(ET)(EF) \quad \text{(B.2-24)}$$

$$(\text{chemicals})I_a = (C_a)(IR)(ET)(EF)(ED)/(BW)(AT) \quad \text{(B.2-25)}$$

where:

I_a	=	intake from inhalation (pCi) or (mg/kg-day)
C_a	=	concentration in air (pCi/m^3) (mg/m^3)
IR	=	inhalation rate (m^3/hr)
ET	=	exposure time (hr/d)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)

AT = averaging time (days); for noncarcinogens, AT equals (ED) (365 days/yr); for carcinogens, AT equals (70-year lifetime) (365 days/yr)

Child Inhalation Rate

An inhalation rate (IR) of 0.5m^3/hour was calculated for the child receptors to be used for residential exposure scenarios. This value was developed utilizing currently used physiological parameters by pediatric medical practitioners from the Children's Hospital at the University of Cincinnati Medical Center. The ventilation volumes and rates used approximate the normal active child, in a conservative manner. The value developed for risk assessments is an upward adjustment of the normal child to the moderately active child whose ventilation rate and volume are on the high side of the normal range. Accordingly, the value of 0.5m^3/hour is used as the IR for children, 0 to 6 years of age, and accounts for an increased activity above the normal resting level of activity. This value, developed in consultation with the physicians, is based upon current medical parameters used to treat patients. A value of 0.83m^3/hour was used for trespassing scenarios to account for even higher ventilation volumes.

B.2.4.2.6 External Exposure

The equation used to estimate intake from exposure to direct penetrating radiation is calculated in the following manner:

$$I_{ER} = (C_r)(CF)(EF)(ED)[ET_{OUT} \times (1 - SH_{OUT}) + ET_{IN} \times (1-SH_{IN})] \quad \text{(B.2-26)}$$

I_{ER} = intake from external radiation(pCi-y/g)

C_r = concentration in soil (pCi/g)

ET_{OUT} = outdoor exposure time (hr/day)

ET_{IN} = indoor exposure time (hr/day)

EF = exposure frequency (days/yr)

ED = exposure duration (yr)

SH_{IN} = shielding factor for indoors (unitless = 0.5)

SH_{OUT} = shielding factor for outdoors (unitless = 0)

CF = conversion factor (1.14 x 10^{-4}yr/hr)

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B.2.4.2.7 Ingestion of Water

The equations used to estimate intake from drinking water are adapted from EPA (1989a). The intake equations are:

$$(\text{radionuclides})I_w = (C_w)(IR)(EF)(ED) \quad \text{(B.2-27)}$$

$$(\text{chemicals})I_w = (C_w)(IR)(ED)(EF)/(BW)(AT) \quad \text{(B.2-28)}$$

where:

I_w	=	intake from drinking water (pCi) or (mg/kg-day)
C_w	=	concentration in water (pCi/L) (mg/L)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days); for noncarcinogens, AT equals (ED) (365 days/yr); for carcinogens, AT equals (70-year lifetime) (365 days/yr)

B.2.4.2.8 Inhalation of VOCs Released from Household Water

The model for estimating the inhaled dose of volatile CPC released from household use, called the Andelman model (EPA 1991d), applies several assumptions:

- The volume of water used in a residence by a family of four is 720 L/day
- The volume of air in the dwelling is 150,000 L
- The air exchange rate is 0.25 m^3/hr
- The average water-to-air transfer efficiency is 0.5 (i.e., half the concentration of a volatile chemical in water is transferred to air).

The Andelman model is applicable to chemicals that will readily volatilize from water (i.e., those with a Henry's Law constant greater than 1 x 10^{-5} atm-m^3/mole and a molecular weight less than 200 g/mole). The equation is:

$$(\text{chemicals})I_a = (C_w)(IR)(K)(EF)(ED)/(BW)(AT) \quad \text{(B.2-29)}$$

where:

I_a	=	average inhaled dose of volatile CPC in air from household use of water (mg/kg-day)
C_w	=	concentration of CPC in water (mg/L)
IR	=	inhalation rate (m^3/day)
K	=	volatilization factor of 0.0005 (unitless) x 1000 L/m^3
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (d)

B.2.4.3 Lead

Through decades of medical observation and scientific research the non-cancer toxicity of lead has been characterized. The EPA has determined that it is inappropriate to derive an RfD for oral exposure to lead for several reasons. First, the use of an RfD assumes that a threshold for toxicity exists, below which adverse effects are not expected to occur: however, the most sensitive effects of lead exposure, impaired neurobehavioral development in children and altered blood enzyme levels associated with anemia, may occur at blood level concentrations so low as to be considered practically nonthreshold in nature. Second, RfD values are specific for the route of exposure for which they are derived. Lead, however, is ubiquitous, so that exposure occurs from virtually all media and by all pathways simultaneously, making it practically impossible to quantify the contribution to blood lead from any one route of exposure. Finally, the dose-response relationship common to many toxicants, and upon which derivation of an RfD is based, do not hold true for lead.

To aid in predicting blood-lead levels of children (ages zero to seven years) resulting from multimedia exposure to lead in a residential setting, the Environmental Criteria and Assessment Office of the EPA Office of Research and Development (ECAO/ORD) is attempting to develop and perfect the Uptake/Biokinetic (UBK) Model. The model incorporates the following:

- media-specific uptake factors for exposure to lead via air, drinking water, soil, indoor dust, diet, and paint;

- default values of concentrations of lead in various media that reflect ambient background levels; and

- default values for exposure factors such as liters of water ingested per day, amount of soil ingested per day, and amount of air inhaled per day, which are mean values for children ages zero to seven years old.

In more recent guidance (EPA 1991e) EPA states that they are seeking resolution of specific technical concerns before issuing a directive recommending the UBK model as the preferred method of setting lead clean-up levels at CERCLA sites. The model is under review by the Science Advisory Board, and a guidance manual is under development.

At the time the Operable Unit 2 baseline risk assessment was conducted, a final version of the EPA UBK model and guidance for its use in Superfund risk assessment was not available. Considering the current limitations of the model, it was not applied in the assessment of lead health effects for Operable Unit 2.

Within the Operable Unit 2 baseline risk assessment, wherever lead was considered to be a CPC, it was included in, and carried through, all intake calculations, but no HI numbers were generated. The reason for doing so was to allow ready calculation of toxic effects at some future time should an RfD be developed and it would be necessary to know the actual/potential toxic effects.

EPA guidance (EPA 1989g) established an interim soil cleanup level of 500 to 1000 milligrams per kilogram to be applied at Superfund sites. This range is considered by EPA to be protective for direct contact with lead-contaminated soils in residential settings. That guidance was adopted by Operable Unit 2 in assessing the toxic effects of lead on potential receptors.

B.2.4.4 Indoor Radon

Potential exposures to indoor radon were calculated according to the models described in Attachment I.

B.2.5 TOXICITY ASSESSMENT

A toxicity assessment examines information concerning the potential effects of exposure to CPCs and summarizes EPA-approved toxicity values. The goal is to provide, for each CPC, a quantitative estimate of the relationship between the magnitude and type of exposure and severity or probability of

human health effects. The toxicity assessment contains a compilation of toxicity values for CPCs. Summaries of the toxic effects associated with major CPCs are included as Attachment II to this risk assessment.

B.2.5.1 Toxicity Values For Constituents of Potential Concern

This section presents tabulated summary toxicity information for CPCs with noncarcinogenic and carcinogenic effects.

B.2.5.1.1 Noncarcinogens

For noncarcinogens, it is assumed that a dose exists below which no adverse health effects will be seen. Below this "threshold" dose, exposure to a chemical can be tolerated without adverse effects. The potential for noncarcinogenic health effects resulting from exposure to chemical contaminants is assessed by comparing an exposure estimate (intake) to a reference dose (RfD).

The RfD is expressed in units of milligrams/kilograms-day (mg/kg-day) and represents a daily intake of constituent per kilogram of body weight that is not sufficient to cause the threshold effect of concern for the constituent.

An RfD is specific to the chemical, the route of exposure, and exposure duration. To derive an RfD, the EPA reviews all relevant human and animal studies for each compound and selects the study (or studies) pertinent to the derivation of the specific RfD. Each study is evaluated to determine the no-observed-adverse-effect level (NOAEL) or, if data are inadequate for such a determination, the lowest-observed-adverse-effect level (LOAEL). The NOAEL corresponds to the dose, in mg/kg-day, that can be administered over a lifetime without inducing observable adverse effects. The LOAEL corresponds to the lowest daily dose, in mg/kg-day, that can be administered over a lifetime that induces an observable adverse effect. The toxic effect characterized by the LOAEL is referred to as the "critical effect". To derive an RfD, the NOAEL (or LOAEL) is divided by uncertainty factors to ensure that the RfD will be protective of human health. Uncertainty factors are applied to account for (1) extrapolation of data from laboratory animals to humans (interspecies extrapolation), (2) variation in human sensitivity to the toxic effects of a compound (intraspecies differences), (3) derivation of a chronic RfD based on a subchronic rather than a chronic study, and/or (4) derivation of an RfD from the LOAEL rather than the NOAEL. In addition to these uncertainty factors, modifying factors

between 0 and 10 may be applied to reflect additional qualitative considerations in evaluating the data. For most compounds, the modifying factor is 1.

Separate RfDs are needed for ingestion and inhalation pathways. EPA (1992b) presents reference concentrations (RfC) for the inhalation route. Inhalation noncancer toxicity values are usually expressed as inhalation concentrations (RfC) in units of mg/m^3. Because noncancer risk characterization requires an estimate of dose in units of mg/kg-day, the inhalation RfC must be converted to an inhalation RfD. This is done by assuming humans weigh 70 kg and inhale 20 m^3 of air per day (i.e., the inhalation RfC (mg/m^3) multiplied by 20 m^3/day and divided by 70 kg yields an inhalation RfD (mg/kg-day)).

The primary source of values for RfDs are the Integrated Risk Information System (IRIS) and the HEAST compiled and maintained by the EPA (EPA 1992a, 1993b). Other EPA sources of RfD values were also consulted, when available. Surrogate chemicals were not used for derivation of an RfD unless the chemical similarity was close and the derivation was highly defensible. Since dermal RfDs are derived from oral RfDs, the oral target organ is adopted as the dermal target organ. RfDs for noncarcinogenic CPCs in Operable Unit 2 are presented in Table B.2-7.

B.2.5.1.2 Chemical Carcinogens

The toxicity information considered in the assessment of potential carcinogenic risks includes (1) a weight-of-evidence classification and (2) a slope factor. The weight-of-evidence classification qualitatively describes the likelihood that a chemical is a human carcinogen and is based on an evaluation of available data from human and animal studies. A chemical may be placed in one of three groups in EPA's classification system to indicate its potential for carcinogenic effects: Group A, a human carcinogen; Group B1, or B2, a probable human carcinogen; and Group C, a possible human carcinogen. Chemicals that cannot be classified as human carcinogens because of a lack of data are placed in Group D, and those for which there is evidence of noncarcinogenicity in humans are placed in Group E.

The cancer slope factor is the toxicity value used to quantitatively express the carcinogenic risk of cancer-causing constituents. It is defined as the upper-bound estimate of the probability of cancer incidence per unit dose averaged over a lifetime. Slope factors are derived from studies of carcinogenicity in humans and/or laboratory animals and are typically calculated for compounds in

TABLE B.2-7

REFERENCE DOSES FOR NONCARCINOGENIC CHEMICALS

Parameter	Chronic Oral Reference Dose (mg/kg-day)	Chronic Inhalation Reference Dose[a] (mg/kg-day)	Reference Concentration (mg/m^3)	Effect of Concern		Uncertainty Factor		
				Oral	Inhalation	Oral	Inhalation	Source
RADIOLOGICAL								
Cesium-137+1d	ND	ND	ND	ND	ND	ND	ND	ND
Neptunium-237+1d	ND	ND	ND	ND	ND	ND	ND	ND
Lead-210+2d	ND	ND	ND	ND	ND	ND	ND	ND
Plutonium-238	ND	ND	ND	ND	ND	ND	ND	ND
Plutonium-239/240	ND	ND	ND	ND	ND	ND	ND	ND
Radium-224	ND	ND	ND	ND	ND	ND	ND	ND
Radium-226+8d	ND	ND	ND	ND	ND	ND	ND	ND
Radium-228+1d	ND	ND	ND	ND	ND	ND	ND	ND
Ruthenium-106	ND	ND	ND	ND	ND	ND	ND	ND
Strontium-90+1d	ND	ND	ND	ND	ND	ND	ND	ND
Technetium-99	ND	ND	ND	ND	ND	ND	ND	ND
Thorium-228+7d	ND	ND	ND	ND	ND	ND	ND	ND
Thorium-230	ND	ND	ND	ND	ND	ND	ND	ND
Thorium-232-10d	ND	ND	ND	ND	ND	ND	ND	ND
Thorium-total	ND	ND	ND	ND	ND	ND	ND	ND
Uranium-234	ND	ND	ND	ND	ND	ND	ND	ND
Uranium-235	ND	ND	ND	ND	ND	ND	ND	ND
Uranium-235/236	ND	ND	ND	ND	ND	ND	ND	ND
Uranium-238+2d	ND	ND	ND	ND	ND	ND	ND	ND
Uranium-total	3.0×10^{-3}	ND	ND	Reduced body weight, renal damage	1000	ND	ND	ND

See footnotes at end of table

TABLE B.2-7
(Continued)

Parameter	Chronic Oral Reference Dose (mg/kg-day)	Chronic Inhalation Reference Dose[a] (mg/kg-day)	Reference Concentration (mg/m^3)	Effect of Concern		Uncertainty Factor		
				Oral	Inhalation	Oral	Inhalation	Source
INORGANICS								
Antimony	4.0×10^{-4}	ND	NA	Taste threshold	Nasal Cavity Rhinitis	1	30	a,b
Arsenic	3.0×10^{-4}	ND	ND	Keratosis; hyperpigmentation	ND	3	ND	a
Barium	7.0×10^{-2}	1.43×10^{-4}	5.0×10^{-4}	Increased blood pressure	Fetotoxicity	3	1000	a,b
Beryllium	5.0×10^{-3}	ND	ND	None observed	ND	100	ND	a
Cadmium (food)	1.0×1^{-5}	ND	ND	Renal damage	Cancer	10	ND	a
Cadmium (water)	5.0×10^{-4}	ND	ND	Renal damage	Cancer	10	NC	a
Cyanide	2.0×10^{-2}	ND	ND	Weight loss, thyroid effects, myelin degradation	ND	100	ND	a
Lead (Inorganic)	ND[c]	ND	ND	CNS effects	CNS effects	ND	ND	a
Manganese (oral & food)	1.4×10^{-1}	1.1×10^{-4a}	4.0×10^{-4}	No effects	ND	1	ND	a
Selenium	5.0×10^{-3}	ND	ND	Selenosis	ND	3	ND	a
Thallium	7.0×10^{-5}	ND	ND	Increased SGOT and serum LDH levels; alopecia	ND	3000	ND	a
VOLATILES								
1,1,2-Trichlorotrifluoromethane	3.0×10^{-1}	ND	ND	Survival/Histopathology	ND	1000	ND	e
1,2-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND	f
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	f

See footnotes at end of table

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1-6502

TABLE B.2-7
(Continued)

Parameter	Chronic Oral Reference Dose (mg/kg-day)	Chronic Inhalation Reference Dose[a] (mg/kg-day)	Reference Concentration (mg/m^3)	Effect of Concern		Uncertainty Factor		
				Oral	Inhalation	Oral	Inhalation	Source
SEMIVOLATILES								
2-Methylnapthalene	ND	ND	ND	ND	ND	ND	ND	f
4-Methylphenol(p-cresol)	5.0×10^{-3}	ND[d]	ND	Reduced body weight gain; neurotoxicity	ND	1000	ND	a,b
Benzo(a)anthracene	ND	ND[j]	ND	ND	ND	ND	ND	f
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	f
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	f
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	f
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	f
Bis(2-Ethylhexyl)phthalate	2.0×10^{-2}	ND	ND	ND	ND	ND	ND	f
Carbazole	ND	ND	ND	ND	ND	ND	ND	f
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	f
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	f
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	f
Tributyl phosphate	5.0×10^{-3}	ND	ND	ND	ND	ND	ND	f
PESTICIDES/PCBS								
Aroclor-1254	ND	ND	ND	ND	ND	ND	ND	f
Aroclor-1260	ND	ND	ND	ND	ND	ND	ND	f
Dieldrin	5.0×10^{-5}	ND	ND	Liver lesions	ND	100	ND	f
Heptachlorodibenzofuran	ND	ND	ND	ND	ND	ND	ND	f
Heptachlorodibenzo-p-dioxin	ND	ND	ND	ND	ND	ND	ND	f
Octaclorodibenzo-p-dioxin	ND	ND	ND	ND	ND	ND	ND	f

See footnotes at end of table

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TABLE B.2-7
(Continued)

Parameter	Chronic Oral Reference Dose (mg/kg-day)	Chronic Inhalation Reference Dose[a] (mg/kg-day)	Reference Concentration (mg/m^3)	Effect of Concern		Uncertainty Factor		
				Oral	Inhalation	Oral	Inhalation	Source
PESTICIDES/PCBS (Continued)								
Tetrachlorodibenzofuran	ND	ND	ND	ND	ND	ND	ND	f

[a]EPA 1992a, IRIS database 1993, July 1993.
[b]EPA 1992b, HEAST, Annual FY-1992.
[c]The EPA RfD Work Group considers it inappropriate to develop a RfD for inorganic lead (1985).
[d]The health effects data for 4-methyphenol were reviewed by the EPA RfD/RfC work group and were determined to be inadequate for the derivation of an inhalation RfC (EPA 1993).
[e]EPA IRIS database 1993, February 1993.
[f]EPA IRIS database 1994, May 1994.
CNS = Central nervous system
ND = No data available

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Groups A, B1, and B2. Slope factors are specific to a chemical and route of exposure and expressed in units of $(mg/kg\text{-}day)^{-1}$ for both oral and inhalation routes. The induction of cancer by dermal absorption is evaluated using oral slope factors. Inhalation cancer toxicity values are usually expressed as inhalation unit risks in units of reciprocal $\mu g/m^3$ ($1/\mu g/m^3$). Because cancer risk characterization requires an estimate of reciprocal dose in units of 1/mg/kg-day, the inhalation unit risk must be converted to the mathematical equivalent of an inhalation cancer slope factor, or risk per unit dose (mg/kg-day). This is done by assuming humans weigh 70 kg and inhale 20 m^3 of air/day (i.e., the inhalation unit risk ($1/\mu g/m^3$) divided by 20 m^3/day, multiplied by 70 kg and multiplied by 1000 $\mu g/mg$ yields the mathematical equivalent of an inhalation slope factor (1/mg/kg-day)). Slope factors for CPCs are presented in Table B.2-8. The primary sources of these toxicity values are EPA's IRIS (EPA 1992a) and the quarterly updated HEAST (EPA 1993b). Other EPA sources of cancer slope factors were also consulted when available. Surrogate chemicals were not used for cancer slope factor derivation unless the chemical similarity was close and the derivation was highly defensible.

The following exceptions, where information from one chemical was used to model a compound class, are noted:

- The carcinogenicity of all polychlorinated biphenyl (PCB) isomers is assumed to be equal to the carcinogenicity of Aroclor-1260 because dose-response data for other isomers are inconclusive.
- The carcinogenicity of dioxins and furans are determined using EPA's revised 1989 "Toxicity Equivalency Factors" (TEF) (EPA 1990e). These TEFs were determined with the basic assumption that all dioxins and furans are carcinogenic.
- The carcinogenicity of PAHs is determined initially using the benzo(a)pyrene cancer slope factors, and refined using a relative potency approach (Clement 1988, 1990).

For risk assessment purposes, mixtures of chlorinated dibenzo-p-dioxins (CDD) and chlorinated dibenzofurans (CDF) can be evaluated using EPA's toxicity equivalency method. This approach, based on available toxicological data, uses derived TEFs to convert the concentration of CDD or CDF congeners into an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). Table B.2-9 presents the TEFs for a variety of CDD and CDF congeners. Congeners containing chlorines at the 2,3,7, and 8 positions are considered to be more toxic, and congeners without chlorines at those positions are assigned a TEF of "0." However, to be more conservative, all

TABLE B.2-8

CANCER SLOPE FACTORS FOR CARCINOGENIC CHEMICALS

Parameter	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Inhalation Cancer Slope Factor[a] $(mg/kg\text{-}day)^{-1}$	Tumor Site		Cancer Classification	Source
			Oral	Inhalation		
RADIOLOGICAL						
Cesium-137+1d	2.8×10^{-11}	1.9×10^{-11}	ND	ND	A	n
Neptunium-237+1d	2.2×10^{-10}	2.9×10^{-8}	ND	ND	A	n
Lead-210+2d	6.6×10^{-10}	4.0×10^{-9}	ND	ND	A	n
Plutonium-238	2.2×10^{-10}	3.9×10^{-8}	Neoplasms/Lung tumors	ND	A	n
Plutonium-239/240	2.3×10^{-10}	3.8×10^{-8}	ND	ND	A	n
Radium-224	3.8×10^{-11}	1.2×10^{-9}	Bone/Cancer/ Pananasal Sinus	ND	A	n
Radium-226+8d	7.8×10^{-10}	7.0×10^{-9}	ND	ND	A	n
Radium-228+1d	1.0×10^{-10}	6.9×10^{-10}	ND	ND	A	n
Ruthenium-106	9.5×10^{-12}	4.4×10^{-10}	ND	ND	A	n
Strontium-90+1d	3.6×10^{-11}	6.2×10^{-11}	ND	ND	A	n
Technetium-99	1.3×10^{-12}	8.3×10^{-12}	ND	ND	A	n
Thorium-228+7d	5.5×10^{-11}	7.8×10^{-8}	ND	ND	A	n
Thorium-230	1.3×10^{-11}	2.9×10^{-8}	ND	ND	A	n
Thorium-232-10d	1.7×10^{-10}	1.1×10^{-7}	ND	ND	A	n
Thorium-total	ND	ND	ND	ND	A	n
Uranium-234	1.6×10^{-11}	2.6×10^{-8}	Bone Sarcomer	ND	A	n
Uranium-235	1.6×10^{-11}	2.5×10^{-8}	ND	ND	A	n
Uranium-235/236	1.6×10^{-11}	2.5×10^{-8}	ND	ND	A	n
Uranium-238+2d	2.8×10^{-11}	5.2×10^{-8}	ND	ND	A	n
Uranium-total	ND	ND	ND	ND	A	n
INORGANICS						
Antimony	ND	ND	ND	ND	ND	b
Arsenic	$1.75 \times 10^{+0h}$	$1.5 \times 10^{+1}$	Sin, Lung	Respiratory System	A	b,c
Barium	ND	ND	ND	ND	ND	b,g

See footnotes at end of table

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TABLE B.2-8
(Continued)

Parameter	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Inhalation Cancer Slope Factor[a] $(mg/kg\text{-}day)^{-1}$	Tumor Site		Cancer Classification	Source
			Oral	Inhalation		
INORGANICS (Continued)						
Beryllium	$4.3 \times 10^{+0}$	$8.4 \times 10^{+0}$	Total Tumors	Lung	B2	b
Cadmium	ND	$6.3 \times 10^{+0}$	ND	Respiratory System	A	b,c
Lead (Inorganic)	ND	ND	ND	ND	B2	b
Nickel	ND	8.4×10^{-1}	ND	Respiratory System	A	b,g
Selenium	ND	ND	Liver, Lung	ND	B2	b
Thallium	ND[i]	ND	ND	ND	D	b
VOLATILES						
1,1,2-Trichlorotrifluoromethane	ND	ND	ND	ND	ND	k
1,2-Diethylbenzene	ND	ND	ND	ND	ND	k
1,4-Dioxane	1.1×10^{-2}	ND	Nasal cavity/Liver	ND	B2	j
SEMIVOLATILES						
2-Methylnapthalene	ND	ND	ND	ND	ND	ND
4-Methylphenol(o-cresol)	ND	ND	ND	ND	C	b
Benzo(a)anthracene	7.3×10^{-1}	6.1×10^{-1}	ND	Pulmonary adenomas	B2	d,f
Benzo(a)pyrene	$7.3 \times 10^{+0}$	6.1×10^{-0}	ND	Total tumors	B2	j
Benzo(b)fluoranthene	7.3×10^{-1}	6.1×10^{-1}	ND	Lung	B2	j
Benzo(g,h,i)perylene	ND	ND	ND	ND	D	j
Benzo()fluoranthene	7.3×10^{-2}	6.1×10^{-2}	ND	ND	B2	j
Bis(2-Ethylhexyl)phthalate	1.4×10^{-2}	ND				j
Carbazole	2.0×10^{-2}	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	$7.3 \times 10^{+0}$	$6.1 \times 10^{+1}$	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	7.3×10^{-1}	6.1×10^{-1}	ND	ND	ND	j
Phenanthrene	ND	ND	ND	ND	ND	j
Tributyl phosphate	ND	ND	ND	ND	ND	j

See footnotes at end of table

TABLE B.2-8
(Continued)

Parameter	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Inhalation Cancer Slope Factor[a] $(mg/kg\text{-}day)^{-1}$	Tumor Site		Cancer Classification	Source
			Oral	Inhalation		
PESTICIDES / PCBS						
Aroclor-1254	$7.70 \times 10^{+0}$	ND	Liver	ND	B2	m
Aroclor-1260	$7.70 \times 10^{+0}$	ND	Liver	ND	B2	m
Dieldrin	$1.60 \times 10^{+1}$	$1.60 \times 10^{+1}$	Liver/Lung	ND	B2	k
Heptachlorodibenzofuran[j]	$1.5 \times 10^{+4}$	$1.5 \times 10^{+4}$	ND	ND	ND	ND
Heptachlorodibenzo-p-dioxin[j]	$1.5 \times 10^{+4}$	$1.5 \times 10^{+4}$	ND	ND	ND	ND
Octaclorodibenzo-p-dioxin[j]	$1.50 \times 10^{+2}$	$1.50 \times 10^{+2}$	ND	ND	ND	ND
Tetrachlorodibenzofuran[j]	$1.5 \times 10^{+3}$	$1.5 \times 10^{+3}$	ND	ND	ND	ND

[a]Where only a unit risk for inhalation is available derived by assuming a 70 g adult inhales $20m^3$ of air/day.
[b]EPA IRIS database (EPA 1992a)
[c]The HEAST (1992b) presented an inhalation slope factor of 50 (mg/g-day)-1, based on absorbed dose (absorption factor of 0.3). A risk of 15 $(mg/g\text{-}day)^{-1}$ based on ambient dose is the value used in this risk assessment.
[d]EPA, HEAST, Annual FY-1991
[e]No data presented for chemically induced carcinogenicity - radiocarcinogenicity of uranium isotopes are discussed elsewhere.
[f]Slope factors for benzo(a)pyrene used for B2 PAHs.
[g]EPA, HEAST, Annual FY 1992.
[h]Derived from the proposed inorganic arsenic ingestion unit risk [5×10^{-5} $(\mu g/l)^{-1}$]. "The uncertainties associated with ingested inorganic arsenic are such that estimates could be revised downward as much as an order of magnitude, relative to the risk estimates associated with most other carcinogens" (EPA 1993).
[i]Not classified or not classifiable as to human carcinogenicity.
[j]For polychlorinated dibenzo-p-dioxin and polychlorinated dibenzofurans, the 2, 3, 7, 8-TCDD toxicity equivalents will be calculated using the appropriate 1-TEFS/89 (1989 EPA Interim) Toxicity Equivalent Factor (EPA 1990e).
EPA Iris database 1994, May 1994
[l]EPA Iris database 1991, January 1991
[m]EPA Iris database 1994, September 1991
[n]EPA HEAST 1993
ND = No data available

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TABLE B.2-9

DIOXIN AND FURAN TOXICITY EQUIVALENCY FACTORS[a]

Compound	TEF
DIOXINS	
Mono-, Di-, and Trichlorodibenzo-p-dioxins	0
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1
Other TCDDs	0
2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.5
Other PeCDDs	0
2,3,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.1
Other HxCDDs	0
2,3,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	0.01
Other HpCDDs	0
Octaclorodibenzo-p-dioxins (OCDD)	0.001
FURANS	
Mono-, Di-, and Trichlorodibenzo-p-furans	0
2,3,7,8-Tetrachlorodibenzo-p-furan (TCDF)	0.1
Other TCDFs	0
1,2,3,7,8-Pentachlorodibenzo-p-furans (PeCDF)	0.05
2,3,7,8-Pentachlorodibenzo-p-furan (PeCDF)	0.5
Other PeCDFs	0
2,3,7,8-Hexachlorodibenzo-p-furan (HxCDF)	0.1
Other HxCDFs	0
2,3,7,8-Heptachlorodibenzo-p-furan (HpCDF)	0.01
Other HpCDFs	0
Octaclorodibenzo-p-furans (OCDF)	0.001

[a]EPA 1990e.

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unspecified congeners are assumed to be the more toxic form. This introduces a conservative bias to the final estimates of risk.

Carcinogenic risks associated with PAHs are evaluated using the relative potency approach described by Clement (1988 and 1990). This approach, approved by EPA Region V, considers the relative potency of the individual PAHs and allows site-specific relative concentrations to be expressed in the risk assessment. The relative potency factors for PAHs are presented in Table B.2-10.

B.2.5.1.3 Radiocarcinogens

Some elements have isotopes consisting of unstable atoms (i.e., they undergo spontaneous transformation into more stable atoms). These isotopes are said to be radioactive, and the transformation process is known as radioactive decay. Radioactive decay is usually accompanied by the emission of charged particles and gamma rays. These emissions are called radiation. There are three types of radiation, which are potentially of concern at the FEMP: alpha, beta, and gamma. Alpha and beta radiation consist of charged particles capable of ionizing nearby matter. These radiations generally have little ability to penetrate deeply into adjacent matter, and can be interdicted by skin, air, and clothing. In most cases, the emission of an alpha or beta particle from an atom is followed by a release of x-rays or gamma radiation. Depending on their energies, these radiations may have considerably more penetration power than either alpha or beta radiation and are thus more difficult to shield.

Radiation exposures can be separated into external and internal exposures. External exposure occurs when the radionuclide is outside of the body. Because alpha and beta radiation generally have a low penetrating power, skin and air become effective radiation shields in most cases. Therefore, external exposures to gamma radiation are the primary concern at environmental levels. Internal exposure occurs after the radionuclide enters the body via inhalation or ingestion. For internal exposures, alpha and beta particles become more important because their energy is directly absorbed by living cells.

Inhalation and ingestion are the primary routes for internal exposure to radionuclides. Biologically significant exposures to alpha and beta emitters are more probable for internal exposure because the emitter is in direct contact with tissue. Once in the body, exposure depends on the absorption and retention characteristics of the radionuclide. These absorption and retention characteristics are based

TABLE B.2-10

TOXICITY EQUIVALENCY FACTORS (TEF) AND CORRESPONDING ORAL AND INHALATION SLOPE FACTORS FOR THE GROUP B2 PAHs[a]

PAH	Relative Potency	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Inhalation Slope Factor $(mg\text{-}kg/day)^{-1}$
Benzo(a)pyrene	1.0	7.3	6.1
Benzo(a)anthracene	0.145	1.1	0.89
Benzo(b)fluoranthene	0.1228	0.90	0.75
Benzo(k)fluoranthene	0.0523	0.38	0.32
Dibenzo(a,h)anthracene	1.11	8.1	6.8
Indeno(1,2,3-cd)pyrene	0.278	2.0	1.7

[a]Clement International 1990.

on the chemical form of the radionuclide in a compound and not on the isotopic form of the radionuclide. GI absorption factors and lung retention classifications for the radionuclides of concern are presented in Table B.2-11.

Radioactive contamination within Operable Unit 2 is characterized as low-level ionizing radiation. The principal adverse biological effects associated with ionizing radiation from radioactive substances in the environment are mutagenicity, teratogenicity, and carcinogenicity. Mutagenicity is the ability to induce genetic mutations in the nuclei of either body cells or reproductive cells. Teratogenicity is the ability to induce or increase the incidence of congenital malformations, which are permanent structural or functional deviations produced during embryonic growth and development. Carcinogenicity is the ability to produce cancer. The carcinogenicity of a radioactive isotope of an element depends on several factors including:

- The type of radiation emitted by the radioisotope
- The energy of the radiation emitted
- The radiological half-life of the isotope
- The retention and concentration characteristics of the radioisotope in the human body.

Carcinogenicity is believed to be the limiting deleterious effect at the levels of radiation dose encountered within Operable Unit 2 and has been used as the sole basis for assessing the radiation-related human health risks of a site contaminated with radionuclides (EPA 1989a).

The relationship between radiation dose and health effects is relatively well characterized for high doses (i.e. >10 rad). Hence, risk estimates are strictly applicable only to large populations exposed to high levels of radiation. Lower levels of exposure may constitute a health risk, but a direct cause and effect relationship is difficult to establish because a particular effect in a specific individual can be produced by many different processes. For low doses, health effects are presumed to occur but can only be estimated statistically. Therefore, the risk of cancer incidence from exposure to low levels of ionizing radiation must be extrapolated from incidence data at higher doses.

Under CERCLA methodology, the EPA assumes a unit intake of, or external exposure to, a radionuclide over a lifetime. The annual radiation dose equivalent from the radionuclide to each organ in each year of life is calculated. The average excess number of all types of radiation-induced fatal cancers that occur in a year is then estimated for the corresponding dose equivalents received during that year and relevant preceding years. The excess number of radiation-induced fatal cancers

TABLE B.2-11

CANCER SLOPE FACTORS FOR OPERABLE UNIT 2 RADIONUCLIDES OF CONCERN

Radionuclide	ICRP Lung Class[a]	Inhalation[b] $(pCi)^{-1}$	GI Absorption Factor[b] (f_1)	Ingestion[b] $(pCi)^{-1}$	Penetrating[b] External Exposure $(pCi\text{-}yr/g)^{-1}$
Cesium-137 + dtr	D	1.9×10^{-11}	1.0×10^{0}	2.8×10^{-11}	2.0×10^{-6}
Neptunium-237 + dtr	W	2.9×10^{-8}	1.0×10^{-3}	2.2×10^{-10}	4.3×10^{-7}
Lead-210 + 2 dtrs	D	4.0×10^{-9}	2.0×10^{-1}	6.6×10^{-10}	1.6×10^{-10}
Plutonium-238	Y	3.9×10^{-8}	1.0×10^{-3}	2.2×10^{-10}	2.8×10^{-11}
Plutonium-239/240	Y	3.8×10^{-8}	1.0×10^{-3}	2.3×10^{-10}	2.7×10^{-11}
Radium-224	W	1.2×10^{-9}	2.0×10^{-1}	3.8×10^{-11}	2.3×10^{-8}
Radium-226 + 8 dtrs	W	7.0×10^{-9}	2.0×10^{-1}	7.8×10^{-10}	6.0×10^{-6}
Radium-228 + dtr	W	6.9×10^{-10}	2.0×10^{-1}	1.0×10^{-10}	2.9×10^{-6}
Ruthenium-106	Y	4.4×10^{-10}	5.0×10^{-2}	9.5×10^{-12}	0.0×10^{0}
Strontium-90 + dtr	D	6.2×10^{-11}	3.0×10^{-1}	3.6×10^{-11}	0.0×10^{0}
Technetium-99	W	8.3×10^{-12}	8.0×10^{-1}	1.3×10^{-12}	6.0×10^{-13}
Thorium-228 + 7 dtrs	Y	7.8×10^{-8}	2.0×10^{-4}	5.5×10^{-11}	5.6×10^{-6}
Thorium-230	Y	2.9×10^{-8}	2.0×10^{-4}	1.3×10^{-11}	5.4×10^{-11}
Thorium-232 + 10 dtrs	Y	1.1×10^{-7}	2.0×1^{-1}	1.7×10^{-10}	8.5×10^{-6}
Uranium-234	Y	2.6×10^{-8}	5.0×10^{-2}	1.6×10^{-11}	3.0×10^{-11}
Uranium-235 + dtr	Y	2.5×10^{-8}	5.0×10^{-2}	1.6×10^{-11}	2.4×10^{-7}
Uranium-235/236	Y	2.5×10^{-8}	5.0×10^{-2}	1.6×10^{-11}	2.4×10^{-7}
Uranium-238 + 2 dtrs	Y	5.2×10^{-8}	5.0×10^{-2}	2.8×10^{-11}	3.6×10^{-8}

[a] "Y" = years, "W" = weeks, "D" = days, "*" = gas.
[b] EPA 1993b

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is derived from epidemiological data, extrapolation from high radiation doses to low doses, and hypothetical models for projecting risk through a lifetime. The relationship between cancer incidence and exposure to radioactive materials is quantified by using mathematical extrapolation models, which estimate the largest possible linear slope (within the 95 percent UCL) at low extrapolated doses consistent with the data. Because EPA is concerned with assessing cancer incidence, each radionuclide slope factor has been calculated by dividing the excess fatal cancer risk for that radionuclide by the mortality-to-incidence risk ratio (EPA 1989a) for the types of cancer induced by that radionuclide. This "radiocarcinogenicity slope factor" thus is characterized as the "maximum likelihood estimate of the age-averaged lifetime total excess cancer risk per unit intake or exposure" (EPA 1993b). That is, the true risk to humans, although not identifiable, is not likely to exceed this upperbound estimate; it may, in fact, be lower.

B.2.5.2 Dermal Reference Doses and Cancer Slope Factors

Dermal RfD values and cancer slope factors are derived from the corresponding oral values. In the derivation of a dermal RfD, the oral RfD is multiplied by the gastrointestinal (GI) efficiency factor, expressed as a fraction. The resulting dermal RfD is an RfD based on absorbed dose, which is the appropriate value with which to compare a dermal dose, because dermal doses are expressed as absorbed rather than exposure doses. In a similar manner, and for the same reasons, an oral cancer slope factor is divided, rather than multiplied, by the GI adsorption efficiency because cancer slope factors are expressed as reciprocal dose. Dermal RfD values and cancer slope factors for the chemicals of concern in Operable Unit 2 are presented in Table B.2-12.

The most important consideration regarding the uncertainty associated with a dermal RfD or cancer slope factor is the accuracy of the GI absorption efficiency factor. For this reason, the toxicity profiles presented in Attachment II contain pharmacokinetics sections in which the oral absorption data are evaluated. Where appropriate, the low (most conservative) end of the range of available GI absorption data for humans is used in the derivation of the dermal RfD or cancer slope factor. When the human data are insufficient, animal data are used. Data from high-dose experiments was not used if more suitable data are available and it appears that saturation of the GI absorption process could have occurred.

When sufficient quantitative data were not located, a default GI absorption factor was used. As noted by EPA (1989a), the GI absorption of many metals from the GI tract is limited, and 0.05 is a

TABLE B.2-12

DERMAL REFERENCE DOSES AND CANCER SLOPE FACTORS FOR CHEMICAL CONSTITUENTS OF POTENTIAL CONCERN

Chemical		Gastrointestinal Absorption Fraction	Dermal Reference Dose (mg/kg-day)	Dermal Slope Factor $(mg/kg\text{-}day)^{-1}$
INORGANICS				
Arsenic		0.95[g]	2.85×10^{-4}	1.84×10^{0}
Barium		0.91[f,g]	6.37×10^{-2}	ND[b]
Beryllium		0.01[g]	5.00×10^{-5}	ND
Cadmium	(food)	0.05[a]	5.00×10^{-5}	ND
	(water)		2.50×10^{-5}	ND
Lead		NA[k]	ND	ND
Manganese	(food)	0.03[a]	4.20×10^{-3}	ND
	(water)		1.50×10^{-4}	ND
Molybdenum		0.38[a]	1.90×10^{-3}	ND
Nickel		0.01[c]	2.00×10^{-3}	ND
Selenium		0.8[a]	4.00×10^{-3}	ND
Thallium		1[a]	7.00×10^{-5}	ND
Uranium-Total		0.05[c]	1.50×10^{-4}	ND[d]
VOLATILES				
Benzo(a)anthracene		0.43[a]	ND	ND
Benzo(a)pyrene		0.43[a]	ND	ND
Benzo(b)fluoranthene		0.43[a]	ND	ND
Benzo(g,h,i)perylene		0.43[a]	ND	ND
Benzo(k)fluoranthene		0.43[a]	ND	ND
Carbazole		0.9	ND	0.02
Dibenzo(a,h)anthracene		0.43[a]	ND	ND
Dibenzofuran		NA[k]	ND	ND
Indeno(1,2,3-cd)pyrene		0.43[a]	ND	ND
2-Methylnaphthalene		1.0[f]	ND	ND

See footnotes at end of table

TABLE B.2-12
(Continued)

Chemical	Gastrointestinal Absorption Fraction	Dermal Reference Dose (mg/kg-day)	Dermal Slope Factor $(mg/kg\text{-}day)^{-1}$
	SEMIVOLATILES (Continued)		
Phenanthrene	0.9[e]	ND	ND
Tributyl phosphate	0.9[e]	4.50×10^{-3}	ND
	PESTICIDE/PCBS		
Dioxins/furans	0.5[h]	ND	3.00×10^{5}

[a]See the Toxicity Profile for this chemical in Attachment II.

[b]ND - Not derived.

[c]EPA 1989a, "Risk Assessment Guidance for Superfund, Volume, Human Health Evaluation Manual (Part A)", EPA/540/1-89/002, pp. A-2 to A-3.

[d]The carcinogenicity of uranium is due to its radioactivity rather than chemical toxicity; its cancer potency due to penetrating external radiation is presented in Table B.2-11.

[e]Section B.2.5.2.

[f]Jones, T.D. and B.A. Owen, 1989, "Health Risks from Mixtures of Radionuclides and Chemicals in Drinking Water", Oak Ridge National Laboratory, Oak Ridge, Tennessee, ORNL-6533.

[g]EPA 1993a, Memorandum from ECAO to EPA Region V, 7/21/93, including Attachments 1-6.

[h]ATSDR 1990a, "Toxicological Profile for 2,3,7,8-Tetrachlorodibenzo-p-dioxin," Draft for Public Comment, U.S. Public Health Service, Atlanta, Georgia.

[k]NA - Not appropriate

reasonable default for metals and inorganic substances. EPA (1989a) did not recommend a separate default value for organic chemicals. A compilation of data for 19 organic chemicals presented GI absorption efficiencies of at least 0.9, indicating that organic chemicals are generally readily absorbed. The arithmetic average of the GI efficiencies for the 19 organic chemicals, 0.91368, equivalent to 0.9 when rounded to one significant figure, appears to be a reasonable default GI absorption efficiency factor for organic chemicals. The default of 0.9 for GI absorption is used for organic chemicals for which quantitative data were not sufficient.

B.2.5.3 Toxicity Profiles

Toxicity profiles are included as Attachment II to this risk assessment.

B.2.6 RISK CHARACTERIZATION

Risk characterization is the final step in the risk assessment process, combining the information developed in the toxicity assessment (Section B.2.4) and the exposure assessment (Section B.2.3). The potential of a CPC to cause carcinogenic effects is presented as the incremental lifetime cancer risk (ILCR). Potential noncarcinogenic effects are presented as hazard quotients (HQs) or HIs, as defined below. The parameters necessary to calculate risk and hazard are presented in Sections B.2.4 and B.2.5.

B.2.6.1 Risk Characterization for Chemical Carcinogens

The risk attributed to exposure to chemical carcinogens is estimated as the ILCR probability percent an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. At low doses, the risk of developing cancer is estimated as follows (EPA 1989a):

$$\text{Risk} = (\text{CDI})(\text{SF}) \qquad \text{(B.2-30)}$$

where:

Risk = risk of cancer incidence, expressed as a unitless probability

CDI = chronic daily intake averaged over 70 years (mg/kg/day)

SF = slope factor $(\text{mg/kg/day})^{-1}$

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B.2.6.2 Risk Characterization for Radionuclide Carcinogens

The procedures for estimating the total lifetime excess cancer risks due to continuous, lifetime exposure (i.e., a 70-year average life span) to radionuclides are discussed below.

B.2.6.2.1 Risk Characterization for Internal Exposures

Risk characterization for internal exposures to radionuclides (intake via inhalation or ingestion) is calculated as follows:

$$\text{Risk} = (I)(SF) \qquad \text{(B.2-31)}$$

where:

Risk = risk of cancer incidence, expressed as a unitless probability

I = lifetime radionuclide intake (pCi)

SF = slope factor $(pCi)^{-1}$

The slope factor is either a HEAST (EPA 1993b) value for a particular radionuclide or the sum of the HEAST (EPA 1993b) slope factors for that radionuclide and its short-lived progeny to account for ingrowth during storage and/or environmental transport.

B.2.6.2.2 Risk Characterization for External Gamma Exposures

Risk characterization for external exposure to gamma-emitting radionuclides in contaminated surface soil is calculated as follows:

$$\text{Risk} = (C_s)(SF)(ED)(MF) \qquad \text{(B.2-32)}$$

where:

Risk = risk of cancer incidence, expressed as a unitless probability

C_s = radionuclide soil concentration (pCi/g)

SF = radionuclide slope factor (risk/yr per pCi/g)

ED = exposure duration (yr)

MF = modifying factor, fraction of year exposed (unitless)

B.2.6.3 Risk Characterization for Noncarcinogens

The risk associated with exposure to noncarcinogenic hazardous CPCs was evaluated by comparing an exposure level or intake to a RfD. It is recognized that this methodology for assessing the human health effect for noncarcinogens does not give a measure of risk as is calculated for the carcinogens. Even so, for convenience the term "risk" will continue to be used when discussing these evaluations. The ratio of intake RfD for a single contaminant is the HQ and is defined as (EPA 1989a):

$$HQ = I/RfD \qquad \text{(B.2-33)}$$

where:

HQ = hazard quotient (unitless)

I = intake of a chemical (mg/kg-day)

RfD = reference dose (mg/kg-day)

When using this equation to estimate potential noncarcinogenic risk, the intake and RfD must be for exposures of equivalent duration (e.g., subchronic, chronic, or fewer than two weeks). For this risk assessment, CPC exposures have been evaluated in all cases on a chronic basis, using chronic RfD values. Analogous to cancer risks, dermal noncancer risks were assessed using absorbed dose rather than intake.

In the case of simultaneous exposure of a receptor to several chemicals, an HI was calculated as the sum of the HQs by:

$$HI = I_1/RfD_1 + I_2/RfD_2 + \ldots I_i/RfD_i \qquad \text{(B.2-34)}$$

where:

I_i = intake for the ith toxicant

RfD_i = reference dose for the ith toxicant

An HI is an indicator of the potential for adverse effects associated with chronic exposures. In effect, HIs assume dose additivity for all CPCs (EPA 1989a).

In compliance with EPA guidance (EPA 1989a), the noncarcinogenic HIs summed across pathways were compared to "unity." An HI of unity (or 1.0) indicates that the exposure intake is equal to the

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RfD. If the HI is greater than 1.0 or "above unity," there is concern for potential health effects. Major categories of noncarcinogenic health effects include neurotoxicity, developmental toxicity, reproductive toxicity, immunotoxicity, and adverse effects on target organs, such as hepatic, renal, respiratory, cardiovascular, and dermal/ocular problems (EPA 1989f).

B.2.6.4 Risk Characterization for Background

All site-related risks in the risk assessment are calculated without subtracting the contribution from natural background. In some areas in Operable Unit 2, the concentrations of CPCs are only slightly above background levels. Therefore, it is important to calculate the risks from background contributions to provide a point of comparison for the site-related risk estimates.

Many of the constituents selected as CPCs for Operable Unit 2 are naturally occurring. Therefore, it is informative to estimate what the risk due to these CPCs might be if they were present within each subunit at naturally occurring, or background, concentrations. Calculation of background risks of CPCs used one of two methods. Figure B.2-7 illustrates how the exposure point concentrations for each subunit were chosen. Background risks associated with direct contact to CPCs present in soil or groundwater were estimated using a proportion based on the assumption that the relationship between risk/hazard and CPC concentration in groundwater or soil is linear, such that:

$$R_B = \frac{R_S \times C_B}{C_S}$$

where:

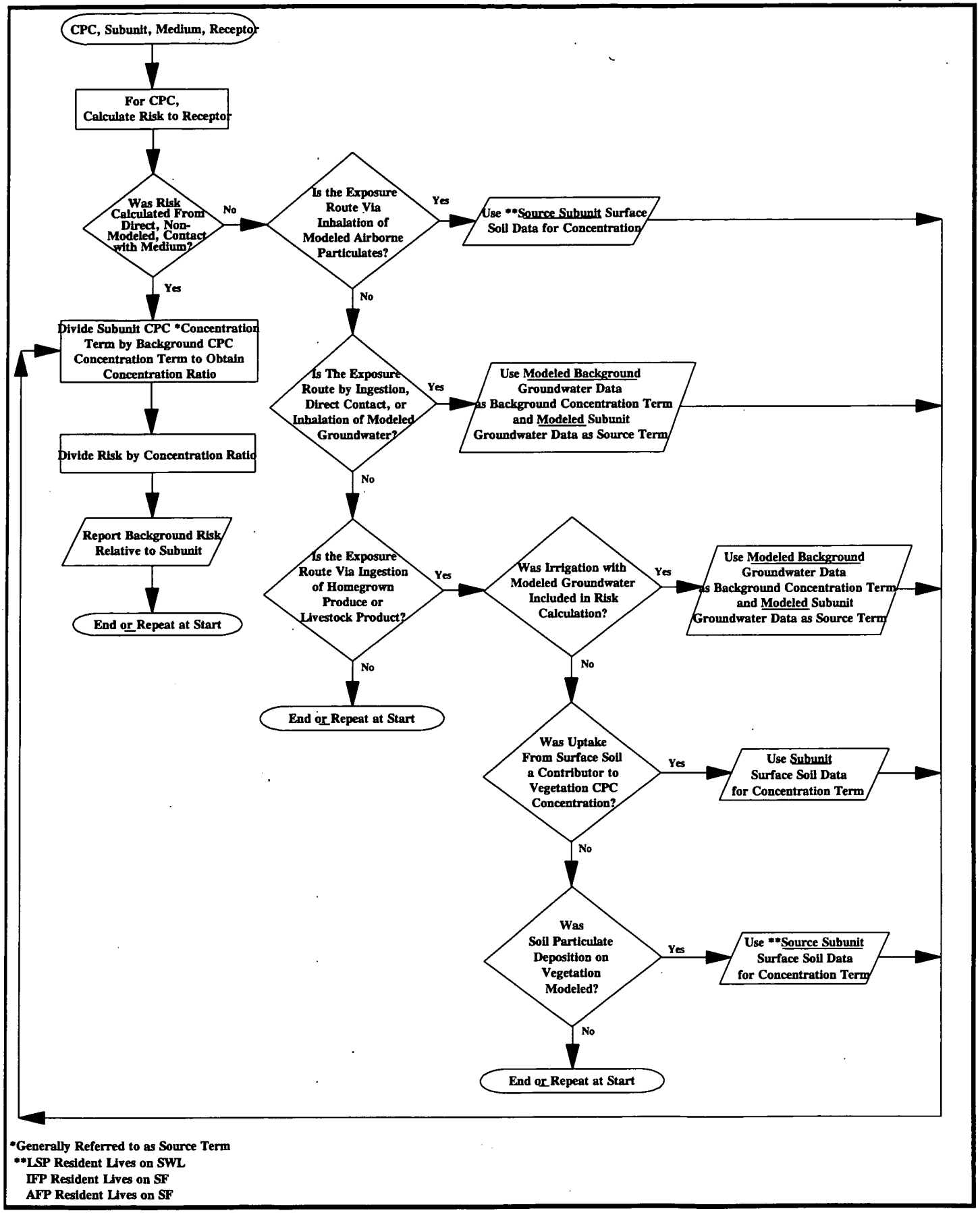
C_S = on-site constituent concentration

C_B = background constituent concentration

R_S = on-site carcinogenic risk or non-carcinogenic hazard

R_B = background carcinogenic risk or non-carcinogenic hazard

For soils, CPC concentrations in background surface soil, along with the subunit-specific CPC concentrations and associated risk, is used in the above proportion to calculate background risk. For groundwater, background soil concentrations were modeled using subunit-specific characteristics to determine the groundwater concentrations that would result if CPCs were present at the specific-subunit at background levels.



*Generally Referred to as Source Term
**LSP Resident Lives on SWL
IFP Resident Lives on SF
AFP Resident Lives on SF

FIGURE B.2-7 CALCULATION OF BACKGROUND RISK FOR OU2

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A proportion is not appropriate to calculate background risks associated with ingestion of homegrown produce, meat, or milk since the relationship between source medium concentration and risk may not be linear. Therefore, background risks were calculated for these pathways in the same manner subunit risks were calculated.

For homegrown produce, meat, and milk exposures, calculation of risks is based on the assumption that the concentration of CPCs in produce, and ultimately in meat or milk, is affected by soil deposition, uptake from soil, and uptake from contaminated groundwater. Hence, a subunit-specific concentration term must be generated to determine the contribution of each of these factors on the total contaminant concentration in produce, meat, or milk. The concentration terms are dependent on subunit-specific characteristic and are generated for each subunit using the same modeling approaches applied in the risk assessment, but using background concentrations as original modeling source terms.

Risks and HIs were calculated for background concentrations of CPCs in soil using the same exposure pathways quantitatively evaluated for the RME on-property resident farmer for soil. The risk assessment models and parameter values used for these background calculations were also the same as those used for evaluating site-related risks to the RME on-property resident farmer. Soil concentrations used for background risk and HI calculations were calculated UCL values for the site-specific background soil sample analytical results.

B.2.7 UNCERTAINTY ANALYSES

Each step of the risk assessment process has an intrinsic degree of uncertainty. The types and magnitudes of uncertainties associated with each stage are of major importance for evaluating and interpreting risk assessments at the FEMP. Uncertainties associated with calculations that occur in the risk assessment may be magnified in the final results. It is not possible to eliminate all uncertainties from the analysis; they must be identified and discussed to determine their significance when making risk management decisions. A presentation, analysis, and discussion of the uncertainties is an important final step in the risk assessment process.

Once each subunit risk assessment is complete, the results are reviewed and evaluated to identify the type and magnitude of uncertainty contributing to the final estimates of risk. Reliance on results from a risk assessment without consideration of uncertainties, limitations, and assumptions inherent in the

risk assessment process can often be misleading. For example, to ensure that potential threat to human health will not be underestimated, conservative estimates must be made in the development of exposure assumptions to ensure that the particular assumptions made are protective of all sensitive subpopulations, or maximum exposed individuals. When a number of conservative assumptions are combined in an exposure model, the resulting calculations propagate the uncertainties, producing a much larger uncertainty for the final results. Thus, both the risk assessment results and the uncertainties associated with those results should be considered when making risk management decisions.

This interpretation is especially relevant when resulting risk numbers exceed the point-of-departure for defining acceptable risk. For example, when risks are calculated that incorporate a high degree of uncertainty fall below an acceptable risk level (e.g., below an ILCR of 10^{-6}), the interpretation is easy and very straight forward. However, when calculated, risks which incorporate a high degree of uncertainty fall within the acceptable risk range (e.g., 10^{-6} to 10^{-4}), a conclusion can be difficult to make unless it considers all of the uncertainties inherent in the calculations.

The actual risk may be one, two, or even three orders of magnitude smaller than the one calculated, which could lead risk managers to make a decision which is unnecessarily protective. This situation may occur in a Superfund risk assessment if the estimated risk were based on limited information for the calculational parameters, conservative assumptions on lifestyles and land use scenarios, and maximum or near-maximum values for many of the modeling and exposure variables to ensure that the risks are not underestimated. The combination of conservative assumptions over a number of areas often results in high risk values as a result of high uncertainty. Characterization of risk based on overly conservative model parameters, scenarios, and assumptions does not convey realistic information and is often misleading if reviewed out of context. A risk estimate for an RME individual in a Superfund risk assessment has been frequently mistakenly viewed as an average risk to the receptor population being evaluated (EPA 1992d).

B.2.7.1 Selection of Constituents of Potential Concern

General uncertainty associated with the selection process used to determine the CPCs in Operable Unit 2 can be attributed to the following sources:

- Sample analytical techniques produce results that may have uncertainty associated with them. These uncertainties are documented by using data qualifiers to reflect the

assumed degree of certainty of measurement. These analytical uncertainties affect the selection of CPCs or the calculation of exposure point concentrations (either measured or modeled) that may be based on a particular analytical result.

- Concentrations of inorganics and radionuclides are compared to background concentrations to determine if their presence is due to naturally occurring concentrations from native soils or are due to site activities. Sampling procedures for groundwater and air used to determine background concentrations may have high detection limits. A naturally occurring chemical that was not detected during background sampling could result in the erroneous detections of a chemical among those selected for further evaluation. Conversely, erroneous detections of site-related chemicals in background samples may lead to the erroneous exclusion of a site-related chemical from further evaluation.

B.2.7.2 Uncertainty in Exposure Assessment

Sources of uncertainty for the exposure assessment arise from calculation of exposure point concentrations, determination of land use scenarios, selection of receptors, and selection of exposure factors.

Predicted concentrations are used as exposure point concentrations in this risk assessment when measured data are not available (e.g., future groundwater contamination). These predictions were made using mathematical representations (models) of the natural systems found or suspected to exist in the study area. Due to the complexity of natural environments, conservative assumptions were often used in these models to estimate final exposure point concentrations. These assumptions are typically made to avoid underestimating the concentrations of contaminants in transport or exposure media (e.g., air or groundwater). The uncertainties associated with modeled concentrations are generally much larger than those associated with measured data. Some general uncertainties associated with modeled exposure point concentrations in Operable Unit 2 can be attributed to the following sources:

- The selection of parameters related to the attenuation and retardation of constituents is a major uncertainty in the groundwater fate and transport analysis. The attenuation and retardation factors of every constituent except uranium were determined after an extensive literature search. It should be noted that the actual retardation factors at the FEMP may not follow the assumed literature values, particularly over the long term. Site-specific attenuation and retardation factors are used when available. The use of site-specific values are assumed to result in lower uncertainty than using literature values.

- The organic decay rates at the FEMP were determined after an extensive literature search. The actual decay rates may or may not follow the literature values because of

site-specific conditions. The use of site data to determine organic decay rates would result in lower uncertainty than that resulting from the use of literature values.

- Transport through the vadose zone is approximated by using a one-dimensional model and assuming the zone is homogeneous. The unsaturated seepage flow rate is a function of several parameters, such as porosity, residual saturation, and pore size distribution index. Due to the heterogeneous nature of the till, these parameters actually change from location to location and from depth to depth.

- Except for uranium-238, the total mass of each constituent is estimated by multiplying the UCL by the volume of the entire waste area, thus assuming the UCL concentration is uniformly distributed through the entire source. This methodology introduces an obvious potential for overestimation of constituent mass.

- The total mass of uranium-238 was estimated from the UCL concentrations in each 125 foot by 125 foot model grid block and the associated volumes.

- The fate and transport modeling used a "70-year rule") see discussion in Appendix A) for these constituents where no or inadequate leachate data exist. This "rule" assumes all the chemical leaches from a particular waste unit in 70 years. This method is considered very conservative for compounds that are insoluble but may underestimate the maximum exposure for soluble compounds.

- Air modeling is based on a number of conservative assumptions. In combination these assumptions appear to overestimate the exposure point concentrations for air-based on-site air monitoring data, according to a literature search for typical ambient air PM_{10} measurements for EPA Region V. The long-term average PM_{10} concentrations calculated are comparable to measured dust concentrations on construction sites. This uncertainty is expected to moderately overestimate risk (i.e., overestimate risks by 1 to 2 orders-of-magnitude).

- The transport models individually made assumptions regarding the fate of individual constituents within source media. However, these models were not combined or linked to consider assumptions made regarding depletion of chemicals from one model and the effect of that assumption on another model (i.e., the leaching models did not consider source depletion from volatilization or fugitive emissions and the air emissions models did not consider losses via leaching). Furthermore, the direct exposure pathways to a particular source (i.e., incidental ingestion of surface soil) did not consider source depletion by leaching, surface water transport, or air emissions. Consequently, this assumption is considered very conservative.

These uncertainties for modeling collectively are assumed to moderately overestimate the concentrations expected in groundwater and for aerial deposition (i.e., overestimate concentration and risk by a factor of 1 to 2 orders of magnitude).

Models are also used to calculate chemical concentrations in plants and animals. Each time a concentration at one level in the food chain is extrapolated from a lower level, uncertainty is introduced into the result. For example, soil-to-plant transfer factors (B_{iv} values) generally represent the maximum amount of contaminant transfer that may occur. In reality, the contaminant transfer is quite dependent on the form of the constituent (e.g., metal species) and other site-related physical conditions (e.g., soil type). Thus actual site transfer factors are unknown. The parameter values selected to estimate contaminant soil-to-plant transfer, water-to-plant transfer and water-to-fish transfer are discussed in Sections B.2.4.2.2 and B.2.4.2.3 and listed and referenced in Table B.2-5A (refer to Comment B-30 for Table B.2-5A). The parameter values chosen are intended to be conservative and thus likely to overestimate transfer and consequently risk. The values chosen are intended to be conservative and they are likely to overestimate risk.

B.2.7.3 Uncertainty in Determination of Land Use

A major uncertainty associated with predicting future exposures at the FEMP site is the future disposition of the property itself. Because it is not possible to predict with certainty what the future uses of the land will be, the most conservative (rather than the most likely) land use is evaluated, as stipulated by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). As noted in Section B.2.4, one of the on-property residents evaluated under future land use for Operable Unit 2 is the resident farmer. It is not known whether or not such a receptor will ever exist.

B.2.7.4 Uncertainty in Selection of Receptors

The receptors selected for evaluation in this and all FEMP risk assessments have been generally selected to reflect and encompass those types of activities which may produce the reasonable maximum exposure individual. Some of these receptors, such as the on-property resident farmer are considered to may or may not ever exist. Risks from such a receptor may overstate probable risk from future use of the property when considered against more plausible land use alternatives (e.g., residential use). Uncertainty associated with the selection of receptors in the current land use scenario is assumed to be low (over- or underestimate risks by a one order of magnitude or less) because the current site environmental setting and configuration was the basis for selection of these receptors. Uncertainty associated with receptors identified in the future land use scenario is considered to be high (i.e., potential to overestimate risk by two or more orders-of-magnitude) due to the low probability of the site being used as a residence or for agricultural purposes.

B.2.7.5 Uncertainty in Selection of Exposure Factors

Each exposure factor selected for use in this risk assessment has some uncertainty associated with it. Generally these factors are based on surveys of physiological and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally have a broad distribution. To avoid the underestimation of exposure, this risk assessment followed EPA's recommendation and used the 95th percentile for the exposure parameters used in this risk assessment. In other words, the values selected represent the observed or expected habits of a small percentage of the population (usually the upper 5 or 10 percent). For example, the resident farmer scenarios were assumed to inhale air at the location of the highest annual average concentration for 350 days per year for 70 years. Seventy years represents the maximum exposure duration and is not based on a statistical assessment of local or regional residence time for farm families.

Generally, the uncertainty can be assessed quantitatively for a number of assumptions made in determining factors for calculating exposure and intakes. Many of these parameters were determined from statistical analyses on human population characteristics. Often the database used to summarize a particular exposure parameter (i.e., inhalation rate) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty (i.e., over or underestimate risks by one order of magnitude or less). For many parameters for which limited information exists (i.e., dermal adsorption of organic chemicals from soils), there is greater uncertainty. However, there is often sufficient data to estimate these parameters with low uncertainty. Few intake parameters have high uncertainty associated with them. In the risk assessment for Operable Unit 2, the particular exposure parameters with the greatest uncertainty are judged to be those associated with time (combination of frequency of contact and duration of time spent on the site). The frequency with which receptors may visit Operable Unit 2 and contact contaminated media is unknown, but for all receptors was assumed to occur with the highest feasible frequency. Similarly, the duration of time spent in contact with contaminated media was selected to represent the reasonable maximum upper limit feasible. The particular exposure pathway with the combination of exposure parameters with the highest uncertainty is undoubtedly dermal contact, which is assumed to result in moderate uncertainty (over or underestimate actual exposure by one to two orders of magnitude) for exposure.

This is because there is often no scientific data indicating the amount of a contaminant absorbed across skin; the amount of soil and water that is likely to contact skin; or, the surface area likely to be exposed.

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Many of the quantities used to calculate exposures and risks in this report are selected from a distribution of possible values. For the RME scenarios, the value representing the 95th percentile is generally selected for each parameter to assure that the assessment bounds the actual risks from a postulated exposure. This risk number is used in risk management decisions, but does not indicate what a more average exposure might be, or what risk range might be expected for individuals in the exposed population. To address these issues, a risk estimate closer to the CT is presented for the maximally exposed individual using the CT scenario. The range of risk for this receptor from the CT scenario to the RME scenario seeks to incorporate the range of uncertainty regarding intake assumptions for this receptor. Parameter values selected for the CT and RME resident farmer scenario are listed together on Table B.2-4. Generally, the CT farmer is assumed to be present on the site for fewer years (9 vs 70 yrs) and for fewer days each year (234 vs 350 days/yr); to inhale particulates for fewer hours per day (4.9 vs 5.7 hrs/day); to ingest less water per day (1.4 vs 2.0 L/day); to absorb contaminants in water in water over a smaller area while bathing (20,000 vs 23,000 cm^2); to ingest less soil (100 vs 180 mg/day); to absorb contaminants in soil over a smaller area (5,000 vs 5,750 cm^2); to spend more time indoors (19.8 vs 18.3 hrs/day); to ingest less homegrown vegetables and fruit (0.05 and 0.02 vs 0.04 and 0.08); to ingest a smaller amount of homegrown meat products (0.05 vs 0.08 kg/day); and to ingest less milk (0.16 vs 0.3 L/day).

B.2.7.6 Uncertainty in Toxicity Assessment

Uncertainty associated with the toxicity assessment is associated with hazard assessment and dose-response evaluations for CPCs. The hazard assessment deals with characterizing the nature and strength of the evidence of causation, or the likelihood that a chemical that induces adverse effects in animals will induce adverse effects in humans. Hazard assessment of carcinogenicity is evaluated as a weight-of-evidence determination, using either the IARC (1987) or EPA (1986b) methods. Positive animal cancer test data suggest that humans contain tissue(s) that may also manifest a carcinogenic response; however, the animal data cannot necessarily be used to predict the target tissue in humans. In the hazard assessment of noncancer effects, however, positive animal data suggest the nature of the effects (i.e., the target tissues and type of effects) anticipated in humans (EPA 1989f).

Uncertainty in hazard assessment arises from the nature and quality (sensitivity and selectivity) of the animal and human data. Uncertainty is decreased when similar effects are observed across species, strain, sex, and exposure route; when the magnitude of the response is clearly dose-related; when pharmacokinetic data indicate a similar fate in animals and humans; when postulated mechanisms of

toxicity are similar for humans and animals; and when the CPC is structurally similar to other chemicals for which the toxicity is more completely characterized. A unique source of uncertainty in cancer hazard assessment involves the relevance of liver tumors in strains of mice with a high background incidence, especially when these tumors provide the only positive response (Scala 1991). Many chlorinated organic chemicals in EPA cancer weight-of-evidence Group B2 fall into this category.

Uncertainty in the dose-response evaluation includes the determination of a slope factor for the carcinogenic assessment and derivation of an RfD or RfC for the noncarcinogenic assessment. Uncertainty is introduced from interspecies (animal-to-human) extrapolation, which, in the absence of quantitative pharmacokinetic, dosimetric, or mechanistic data, is usually based on consideration of interspecies differences in basal metabolic rate. Uncertainty also results from intraspecies, or individual, variation. Most toxicity experiments are performed with animals that are very similar in age and genotype, so that intragroup biological variation is minimal, but the human population of concern may reflect a great deal of heterogeneity including unusual sensitivity or tolerance to the CPC. Even toxicity data from human occupational exposure reflect a bias because only those individuals sufficiently healthy to attend work regularly and those not unusually sensitive to the CPC, are likely to be occupationally exposed. Finally, uncertainty arises from the quality of the key study (from which the quantitative estimate is derived) and the database. For cancer effects, the uncertainty associated with dose-response factors is mitigated by assuming the 95th percentile upper bound for the slope factor. Another source of uncertainty regarding quantitative risk estimation for the carcinogenic assessment is the method by which data from high doses in animal studies are extrapolated to the dose range expected for environmentally exposed humans. The linearized multistage model, which is used in nearly all quantitative estimations of human risk from animal data, is based on a nonthreshold assumption of carcinogenesis. An impressive body of evidence, however, suggests that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are noncarcinogenic (Williams and Weisburger 1991); therefore, the use of the linearized multistage model is conservative for chemicals that exhibit a threshold for carcinogenicity.

For noncancer effects, additional uncertainty factors may be applied in the derivation of the RfD or RfC to mitigate poor quality of the key study or gaps in the database. Additional uncertainty for noncancer effects arises from use of an effect level in the estimation of an RfD or RfC, because this estimation is predicated on the assumption of a threshold below which adverse effects are not

expected. Therefore, an additional uncertainty factor is usually applied to estimate a no-effect level. Additional uncertainty arises from estimation of an RfD or RfC for chronic exposure from less than chronic data. Unless empirical data indicate that effects do not worsen with increasing duration of exposure, an additional uncertainty factor is applied to the no-effect level in the less than chronic study. Uncertainty in the derivation of reference doses is mitigated by the use of uncertainty and modifying factors that normally range between three and ten. Uncertainty factors (UF) and modifying factors (MF) are assigned as follows:

- A UF of ten is used to account for sensitive subpopulations.
- A UF of ten is used when extrapolating from animals to humans to account for interspecific variability.
- A UF of ten is applied to a NOAEL derived from a subchronic study rather than a chronic study.
- A UF of ten is applied to a LOAEL to estimate a NOAEL.
- An MF from >0 to ten is applied to data to reflect the quality of the data from the critical study used to derive the reference dose.

As a result, a combination of uncertainty and modifying factors may exceed 100, 1000, or more for a particular compound.

Uncertainty arises in the dose-response assessment for Operable Unit 2 for values derived for principle CPCs from studies with limitations. As an example of this type of uncertainty, consider the toxicity information for uranium. Uranium as an alpha particle emitter is also considered a carcinogen; however, epidemiological evidence of uranium-induced excess cancer risks are very difficult to obtain. This is largely because the human data available for radiocarcinogenic effects of uranium exposure are for underground miners, who are also simultaneously exposed to radon and radon progeny as a confounding factor. The studies of humans sometimes lack information concerning uranium exposure, potential uranium exposure through previous employment, concurrent smoking patterns, or concurrent radon exposure levels that are needed to more definitively determine the risk attributable to uranium exposure. The human studies of cancer from exposure to uranium frequently reveal a slight excess risk above the natural risk. These facts weaken the power of the human studies to detect any excess risk. These uncertainties are not well known or easily determined

and, as a consequence, introduce moderate to high uncertainty into the Operable Unit 2 risk assessment.

Other toxicity information used in the Operable Unit 2 risk assessment that introduces uncertainty include:

- The EPA inhalation slope factor of 7.7×10^{-12} pCi^{-1} for radon-222 plus its daughters is used to calculate risks resulting from indoor inhalation of radon gases. The EPA bases this slope factor on a 50 percent equilibrium ratio between radon-222 and its short-lived daughters. Studies cited in NCRP Report No. 78 (NCRP 1984b) report a lower value for this equilibrium ratio in indoor air (i.e., 100/50/30/20/20 for radon-222, polonium-218, lead-214, bismuth-214, and polonium-214, respectively). Since the concentration of daughters expected in indoor air is lower than the EPA assumption, the slope factor is probably conservative in this respect.

- PAHs that are classified as B2 probable human carcinogens for which no toxicity data were available are evaluated using benzo(a)pyrene toxicity data. This assumption likely leads to an overestimation of the carcinogenicity of those PAHs because conservative assumptions were used to relate their carcinogenicity to that of benzo(a)pyrene. However, when toxicity equivalency factors were used in this assessment to evaluate their carcinogenicity, this may either underestimate or overestimate the carcinogenic risks. Overall, this increased conservatism does not significantly impact the overall risks from Operable Unit 2 since the majority of risks are posed by other CPCs.

- As with PAHs, the carcinogenicity of dioxins and furans other than the 2,3,7,8-isomer were determined using EPA's revised Toxicity Equivalency Factors (TEFs) (EPA 1990e) in the absence of toxicity values for the different isomers. The TEFs are based on the assumption that all dioxin and furan congeners are carcinogenic. This may introduce a high conservative bias to the results of the assessment.

A significant source of uncertainty for calculating risks from radionuclides in surface soil is the use of EPA slope factors for external radiation exposure. In deriving these slope factors, EPA has assumed that an individual continuously stands on an infinitely thick slab of soil with a uniform radionuclide concentration. To manage complicated calculations for photon attenuation and scattering in soil, EPA has assumed that the activity in the slab source is present on an infinite plane with uniform surface concentration. The slope factors for external radiation exposure are, therefore, based on calculated exposures (and associated risks of cancer incidence) from the hypothetical plane source.

In addition, EPA calculates slope factors for ingestion of many radionuclides using the maximum value for the GI absorption factor. The actual chemical form(s) that influence the magnitude of the GI absorption factor have not been considered.

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To summarize, the uncertainty associated with the toxicity assessment is chemical-specific since it depends on the existing information used to derive the dose-response factor. In general, this uncertainty tends to be higher (overestimate risks by two or more orders of magnitude) for the chemical risk assessment, but tends to be low (overestimate risks by an order of magnitude or less) for radionuclides. This difference is the result of animal versus human data used for chemical and radiological compounds, respectively.

B.2.7.7 Uncertainty in Risk Characterization

Uncertainty in risk characterization results from assumptions made regarding additivity of effects from exposure to multiple compounds from various exposure routes. High uncertainty exists when summing cancer risks or hazard indices for several substances across different exposure pathways. This assumes that each substance has a similar effect and/or mode of action. Often compounds affect different organs, have different mechanisms of action, and differ in their fate in the body where additivity is not appropriate. However, the assumption of additivity is made to provide a conservative estimate of risk.

Risk characterization does not consider antagonistic or synergistic effects. Little to no information is available to determine the potential for antagonism or synergism for CPCs. Therefore, this uncertainty cannot be discussed based on the impact on the risk assessment since it has the potential to either over-or under-estimate potential human health risks.

The additivity of risks from radionuclides and chemical carcinogens is the subject of considerable debate. EPA guidance (EPA 1989a) indicates that the two sets of estimates should be considered separately because 1) chemical CSFs are developed using laboratory experiments and radionuclide toxicity values are based on human epidemiological data, and 2) chemical CSFs represent an upper bound limit value while radionuclide slope factors are "best estimates." Therefore, cancer risks from exposure to radionuclides are presented separately from those from chemical CPCs.

B.3.0 RESULTS

This section summarizes the risk characterization result for each Operable Unit 2 subunit and the cumulative risk from Operable Unit 2 as a whole. Parameters and equations used to calculate risks and hazards are presented in Sections B.2.3, B.2.4, and B.2.5. Tables presenting intake, risks, and hazards associated with each scenario, receptor, and pathway are collected in Attachment B.III to this appendix to facilitate their review. Exposure assessment methodology, assumptions, values, and related information is presented in Section B.2.0.

B.3.1 ACTIVE FLYASH PILE

B.3.1.1 Exposure Point Concentrations

Table B.3.1-1 summarizes the exposure scenarios evaluated to assess risk associated with the Active Flyash Pile. It also summarizes derivation of exposure concentrations specific to this unit. With the exception of groundwater and air exposures, all exposure point concentrations were derived from analytical data on samples collected within the boundaries of the Active Flyash Pile subunit.

For groundwater exposures, data from the Active Flyash Pile were used to develop source terms for estimating future groundwater concentrations as described in Section 5.0 of this RI report and Section B.2.4 of this appendix. To assess risk due to groundwater exposures for this unit, single maximum groundwater concentrations of each groundwater CPC were estimated for both the future off-property farmer and resident child and the future on-property farmer and resident child.

Exposure point concentrations related to air dispersion modeling are presented in Section 5.0 of this RI report. Results utilized in the risk assessment were CPC aerial deposition rates and suspended inhalable particulate CPC concentrations.

Theoretical locations of receptors are described as: on-subunit (directly within subunit battery limits [boundary]); on-property (outside of subunit battery limits, but within FEMP boundary); and off-property (outside of FEMP boundary).

Use of the appropriate receptor to evaluate risk was dependent on the exposure scenario evaluated at a particular subunit. For assessing risk from the Active Flyash Pile, it was assumed that the on-

TABLE B.3.1-1

ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS
FOR SCENARIOS EVALUATED

Current Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current Access Controls (current use of FEMP continues, DOE ownership)	Trespassing Youth	surface soil	incidental ingestion dermal contact external radiation	surface flyash material within subunit
		air	inhalation of particulates, volatiles, radionuclides, and gases	maximum estimated on-subunit current concentration derived from airborne surface flyash material air modeling results
		surface water	incidental ingestion dermal contact	single surface water within subunit
		sediment	ingestion dermal contact external radiation	sediment within subunit
	Off-Property Resident Farmer (adult and child), homegrown produce off-property, livestock grazing off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property current concentrations derived from airborne surface flyash material air modeling concentrations
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property current concentrations derived from deposited airborne surface flyash material air modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property current concentrations derived from deposited airborne surface flyash material air modeling results
	Groundskeeper	air	inhalation particulates, volatiles, and gases	maximum estimated on-subunit current concentration derived from air modeling
		surface soil	ingestion dermal contact external radiation	surface flyash material within subunit

000224

TABLE B.3.1-1
(Continued)

Current Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current with Access Controls (current use of FEMP continues, DOE ownership) (continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruit and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Residential User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Current without Access Controls (current use of FEMP continues)	User of Meat and Milk Products		livestock grazing on-property	ingestion of milk and beef	maximum estimated on-property current concentrations derived from deposited airborne surface flyash material modeling results

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TABLE B.3.1-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne surface flyash material air modeling results
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property future concentrations derived from deposited airborne surface flaysh material air modeling and groundwater modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne surface flyash material air modeling and groundwater modeling results
		groundwater	ingestion dermal contact inhalation of volatiles released during household use	modeled groundwater concentrations off-site at time when contamination is greatest in the Active Flyash Pile
	Expanded Trespasser (youth)	air	inhalation of particulates, radionuclides, volatiles, and gases	maximum estimated on-subunit airborne surface flyash material air modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	incidental ingestion dermal contact external radiation	sediment within subunit
		surface soil	incidental ingestion dermal contact external radiation	surface flyash material within subunit

000226

TABLE B.3.1-1
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership (Continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruits and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Residential User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Without Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property		air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne surface flyash material air modeling results
			plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property future concentrations derived from deposited airborne surface flaysh material air modeling and groundwater modeling results
			livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne surface flyash material air modeling and groundwater modeling results
			groundwater	ingestion dermal contact inhalation of volatiles released during household use	modeled groundwater concentrations off-site at time when contamination is greatest in the Active Flyash Pile

TABLE B.3.1-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future On-Property Resident Farmer (adult and child), located adjacent to the subunit, homegrown produce on-property, livestock grazing on-property, groundwater on-property, RME and CT estimates	air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-property future concentrations from airborne surface flyash material modeling results; indoor radon emissions quantitated
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-property future concentrations derived from deposited airborne surface flyash material air modeling and groundwater modeling results
		livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-property subunit future concentrations derived from deposited airborne surface flyash material air modeling and groundwater modeling results
		groundwater	incidental ingestion dermal contact inhalation of volatiles during household use	modeled groundwater concentrations underlying Active Flyash Pile at time when concentration is greatest
	Future On-Property Resident Farmer (adult and child), located adjacent to the subunit, homegrown produce on-property, livestock grazing on-property, groundwater on-property, RME and CT estimates (continued)	surface soil	incidental ingestion dermal contact external radiation	not quantitated; farmer is living and farming adjacent to subunit and therefore, not in direct contact with surface soil
	Future Homebuilder	waste material/subsurface soil	external radiation incidental ingestion dermal contact	not quantitated; no building on the Active Flyash Pile anticipated
		air	inhalation of particulates, volatiles, and gases	not quantitated; no building on the Active Flyash Pile anticipated

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TABLE B.3.1-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future Perched Groundwater User, homegrown produce on-subunit, livestock grazing on-subunit, groundwater on-property (Solid Waste Landfill and Lime Sludge Ponds only)	air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-property future concentrations from airborne surface flyash material modeling results; indoor radon emissions quantitated
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-property future concentrations derived from deposited airborne surface flyash material air modeling and groundwater modeling results
		livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-property subunit future concentrations derived from deposited airborne surface flyash material air modeling and groundwater modeling results
		perched groundwater directly underlying subunit	ingestion, dermal contact, and inhalation of volatiles released during household use	not quantitated; no perched groundwater at Active Flyash Pile
		soil	incidental ingestion dermal contact external radiation	not quantitated; no building on the Active Flyash Pile anticipated

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property farmer resided adjacent to the subunit and simultaneously farmed that area. The on-property farmer for the Active Flyash Pile was placed adjacent to the subunit because the Active Flyash Pile is considered insufficiently stable to support a farm house and agricultural activities. This and other relevant information regarding receptors, routes of exposure, and exposure point concentrations for the Active Flyash Pile are summarized in Table B.3.1-1.

B.3.1.2 Constituents of Potential Concern

The CPCs identified for surface flyash material (surface soil source), subsurface flyash material (subsurface soil source), and 1000 series well groundwater (perched water) are summarized in Tables B.3.1-2(a), (b), and (c), respectively (Attachment B.III), along with all relevant information regarding frequencies of detection, data distribution, 95 percent UCL's, etc. Table B.3.1-3 summarizes CPCs for the appendix by medium.

B.3.1.3 Risk Characterization for Current Land Use

The scenarios characterized for the Active Flyash Pile assuming continued DOE ownership with access controls are a trespassing youth; the off-property farmer and resident child using food products from livestock grazing off-property and from produce grown off-property; an on-property groundskeeper exposed to on-site contaminant concentrations; and a Great Miami River recreational user, a Great Miami River agricultural user, and a Great Miami River residential user. In the event that the FEMP lost access controls, a user of meat and milk products from livestock grazed on-property was also evaluated.

B.3.1.3.1 Trespassing Youth

Risk was characterized for the trespassing youth contacting CPCs directly in surface flyash materials (surface soil), surface water, and sediment. Additionally, risk was characterized for CPCs contacted via inhalation of particulates derived from airborne surface flyash material. Exposure point concentrations for surface soil, surface water, and sediment were based on analytical data, while those for airborne particulates were based on air modeling results as described in the methodology section and in Appendix A and Section 5.0 of this RI report.

The risks and hazards calculated for the trespassing youth exposed to contaminants in surface soil are presented in Table B.3.1-4 (Attachment B.III). Total risk due to exposure to all CPCs in surface soil by all routes of exposure is 2.6×10^{-5}. This is primarily due to external radiation from radium-226,

TABLE B.3.1-3

ACTIVE FLYASH PILE
OPERABLE UNIT 2 CONTAMINANTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Groundwater (GMA)
arsenic	arsenic	arsenic	arsenic	arsenic
beryllium	beryllium		berylium	berylium
lead	lead		neptunium-237	lead
thallium	thallium		plutonium-238	molybdenum
cesium-137	neptunium-237		plutonium-239/240	neptunium-237
neptunium-237	lead-210		radium-226	strontium-90
plutonium-238	plutonium-238		radium-228	uranium-234
plutonium-239/240	plutonium-239/240		strontium-90	uranium-235/236
radium-226	radium-224		uranium-234	uranium-238
radium-228	radium-226		uranium-235/236	uranium-total
strontium-90	radium-228		uranium-238	2-methylnaphthalene
thorium-228	strontium-90			
thorium-230	thorium-228			
thorium-232	thorium-230			
thorium-total	thorium-232			
uranium-234	thorium-total			
uranium-235/236	uranium-234			
uranium-238	uranium-235			
	uranium-235/236			
	uranium-238			
	2-methylnaphthalene			
	phenanthrene			

radium-228, thorium-228, thorium-232, and arsenic in surface soil for which risks of 6.0×10^{-6}, 2.0×10^{-6}, 4.6×10^{-6}, 4.9×10^{-6}, and, 2.1×10^{-6} were calculated, respectively. Additionally, risk from radium-226 (2.0×10^{-6}) and arsenic (1.0×10^{-6}) in sediment also contributed significantly to the total risk. Total chemical hazards calculated for a trespassing youth exposed to CPCs from active flyash material did not exceed a HI of 1.0.

Risks and hazards due to exposure to surface water for this receptor are presented in Table B.3.1-5 (Attachment B.III). Total risk due to exposure to all CPCs in surface water did not exceed 1.0×10^{-6}. Total HI for surface water was well below 1.0.

B.3.1.3.2 Current Off-Property Farmers

Risk was characterized for the current off-property farmer and resident child contacting CPCs via inhalation of airborne particulates, ingestion of contaminants in airborne particulates via deposition on homegrown produce, and uptake in milk or beef from livestock grazing on particulates deposited on off-site grasses. For all of these routes of exposure, the exposure point concentration was based on air modeling results as described in Section B.2.0 of this appendix and Appendix A and Section 5.0 of this RI report.

Risks and hazards due to surface soil calculated for the current off-property farmer and resident child are presented in Tables B.3.1-6 and B.3.1-7, respectively (Attachment B.III). The risk and HI associated with inhalation of all CPCs in airborne soil particulates was 1.7×10^{-7} and much less than 1.0 for the farmer, respectively. The risk and HI calculated for the off-property resident child were 7.6×10^{-9} and much less than 1.0, respectively.

Risks and hazards associated with ingestion of CPCs in beef and milk for the off-property resident farmer and child are given in Tables B.3.1-8(a) and B.3.1-8(b), respectively (Attachment B.III). Total risk for all CPCs consumed in beef and milk affected by dust deposition from the Active Flyash Pile was 4.7×10^{-8} and 1.2×10^{-8} for the farmer and resident child, respectively. Total HIs for all CPCs consumed in beef and milk was well below a HI of 1.0 for both the farmer and resident child.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property resident farmer and child are given in Tables B.3.1-9(a) and B.3.1-9(b), respectively (Attachment B.III). The total risk for all CPCs consumed in dust affected homegrown produce was

1.3 x 10^{-7} and 4.4 x 10^{-8} for the farmer and resident child, respectively. The total HI for all CPCs consumed in homegrown produce was well below 1.0 for both the farmer and resident child.

B.3.1.3.3 Current User of Milk/Meat Products

Risk was characterized for a current user of milk and meat products from livestock potentially grazing within the Active Flyash Pile boundaries. Exposure point concentrations in beef were derived from the maximum estimated on-property current deposition rates of airborne surface flyash material.

Risk and hazard to the current user of milk and meat products are given in Table 3.1-10 (Attachment III). Total risk was 4.7 x 10^{-7}. Total HI is well below 1.0.

B.3.1.3.4 Current Groundskeeper

Risk and hazard to the current groundskeeper are given in Table B.3.1-11 (Attachment B.III). Total risk was 8.0 x 10^{-5} due mostly to external radiation from radium-226 (2.2 x 10^{-5}), radium-228 (7.4 x 10^{-6}), thorium-228 (1.7 x 10^{-5}), and thorium-232 (1.8 x 10^{-5}) and ingestion of arsenic (8.3 x 10^{-6})in soil. Additional CPCs contributing greater than 1.0 x 10^{-6} risk are presented in Table B.3.1-11. Total HI was below 1.0.

B.3.1.4 Risk Characterization Resident for Future Land Use

The future scenarios characterized for the Active Flyash Pile assuming continued federal ownership are the off-property farmer and resident child and an expanded trespasser. Future scenarios characterized for the Active Flyash Pile assuming private ownership are an on-property farmer and resident child living and farming adjacent (outside the subunit battery limits) to the Active Flyash Pile. The presence of a residence directly on the Active Flyash Pile was considered infeasible due to steep, unstable slopes. An off-property farmer and resident child are evaluated under the private ownership assumption. Therefore, risks for a future homebuilder or perched groundwater user were not evaluated for this subunit. Users of the Great Miami River were also evaluated assuming federal and private ownerships.

B.3.1.4.1 Future Off-Property Farmer

For the future off-property farmer and resident child, private ownership or federal ownership, risks were calculated for exposure to CPCs in airborne surface flyash and groundwater migrating off-site. Receptors were presumed to contact CPCs in air via inhalation of airborne particulates; by

consumption of homegrown produce on which airborne surface flyash was deposited and that was irrigated with contaminated groundwater; by ingestion of milk and beef from cattle grazing on vegetation on which airborne surface flyash was deposited and that consumed contaminated groundwater; and by ingestion of, dermal contact with, and inhalation of contaminants groundwater. All of the exposure point concentrations for this scenario were derived from modeling results as described in the Section B.2.0, Appendix A, and Section 5.0 of this RI report.

Risks and hazards calculated for the future off-property farmer and resident child (private and federal ownership) exposed via direct inhalation of airborne contaminants are presented in Tables B.3.1-12(a), B.3.1-12(b), B.3.1-12(c), and B.3.1-12(d), respectively (Attachment B.III). Total risk associated with inhalation of CPCs in airborne soil particulates is 1.7×10^{-7} and 7.6×10^{-9}, for the future off-property farmer (private and federal ownership) and resident child (private and federal ownership), respectively. There were no hazards associated with inhalation of CPCs emanating from the Active Flyash Pile for either off-property receptor.

Risks and hazards associated with ingestion of CPCs in beef and milk for the off-property farmer and resident child (private and federal ownership) are given in Tables B.3.1-13(a), B.3.1-13(b), B.3.1-13(c) and B.3.1-13(d), respectively (Attachment B.III). The total risk for all CPCs consumed in beef and milk was 4.7×10^{-8} and 1.2×10^{-8} for the farmer and resident child (private and federal ownership), respectively. Total HIs for all CPCs consumed in beef and milk was well below 1.0 for both the farmer and child (private and federal ownership).

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property farmer and resident child (private and federal ownership) are given in Tables B.3.1-14(a), B.3.1-14(b), B.3.1-14(c), and B.3.1-14(d), respectively (Attachment B.III). Total risk for all CPCs consumed in homegrown produce was 1.4×10^{-7} and 4.4×10^{-8} for the farmer and child (private and federal ownership), respectively. Total HI for all CPCs consumed in homegrown produce was below 1.0 for both the farmer and child (private and federal ownership).

Risks and hazards associated with exposures of the off-property farmer and resident child (private and federal ownership) to groundwater are given in Tables B.3.1-15(a), B.3.1-15(b), B.3.1-15(c), and B.3.1-15(d), respectively (Attachment B.III). Total risk via all routes of direct exposure to groundwater (ingestion, inhalation, and dermal contact) for the farmer was 6.4×10^{-6} 6.4×10^{-6} and

for the child was 2.8 x 10^{-7}. Most of this risk is attributable to ingestion of radionuclides uranium-324, and uranium-238. Total HIs via all routes of direct exposure to groundwater for both the farmer and child are less than 1.0.

B.3.1.4.2 Future Expanded Trespasser

The expanded trespasser was assumed to contact CPCs directly via inhalation of airborne particulates of surface soil; ingestion and dermal contact with surface soil, sediment, and surface water; and external radiation resulting from exposure to surface soil and sediment. Most of the exposure point concentrations for this scenario were derived from the analytical data for the subunit, with the exception of air and surface water which were derived using modeled data.

Risks and hazards calculated for the future on-property expanded trespasser due to direct exposure to soil and to airborne particulates are presented in Table B.3.1-16 (Attachment B.III). Total risk due to exposure to all CPCs in soil by all exposure pathways was 4.5 x 10^{-5}. This was primarily due to direct radiation exposures to radium-226, radium 228, thorium-228, and thorium-232 which had risks of 1.2 x 10^{-5} 9.5 x 10^{-6} and 1.0 x 10^{-5}, respectively, and dermal contact with arsenic (5.3 x 10^{-6}) in soil. Total hazard to this receptor was less than 1.0.

Risks and hazards calculated for exposure to surface water are presented in Table B.3.1-17(a) (Attachment B.III). Total risk due to exposure to CPCs in surface water did not exceed the 1.0 x 10^{-6} risk level and total HI was less than 1.0.

Risks and hazards calculated for exposure to sediment are presented in Table B.3.1-17(b) (Attachment III). Total risk via all routes of direct exposure to sediment (ingestion, dermal contact and external radiation) was 4.0 x 10^{-6}. This risk was primarily due to direct irradiation from radium-226 with an associated risk of 2.0 x 10^{-6},and dermal contact with arsenic which had a risk of 10 x 10^{-6}. The total HI to this receptor was less than 1.0.

B.3.1.4.3 Future On-Property Farmers

Risks were quantified for the future on-property farmer and resident child living and farming adjacent to the Active Flyash Pile and using groundwater contaminated by the Active Flyash Pile. Risks were calculated for inhalation of airborne particulates estimated from air modeling results of the Active Flyash Pile; ingestion of homegrown produce on which airborne surface soil was deposited and

which was irrigated with contaminated groundwater; and ingestion of milk and beef from livestock consuming vegetation on which airborne surface flyash was deposited and drinking contaminated groundwater directly underlying the Active Flyash Pile. Exposure point concentrations used in estimating risk for these routes of exposure were derived from air and groundwater modeling results, as described in Section B.2.0, Methodology and Appendix A and Section 5.0 of this report. Both RME and CT risks and hazards were estimated for the on-property farmer.

Risks associated with ingestion, dermal contact, and inhalation of contaminants in groundwater migrating from waste matter in the Active Flyash Pile were assessed independently in order to evaluate the specific contribution to risk resulting from migration of contaminants from the Active Flyash Pile into groundwater. Risks associated with direct contact to surface soil was not evaluated for this scenario since the on-property farmer is located adjacent to the subunit (i.e., not directly on the subunit)and therefore, is not exposed directly to the surface soil from the subunit.

Risks and hazards for an Active Flyash Pile on-property RME farmer and resident child exposed to CPCs in airborne surface soil are given in Tables B.3.1-18(a) and B.3.1-18(b), respectively (Attachment B.III). The total risk for the RME farmer from soil was 1.7×10^{-6}; and for the child was 7.6×10^{-8}. Total HIs from soil to both receptors were below 1.0.

Risks and hazards associated with exposure to contaminants via direct contact with groundwater for the RME future on-property farmer and resident child are given in Tables B.3.1-19(a) and B.3.1-19(b), respectively (Attachment B.III). Total risk for the RME farmer from groundwater was 4.7×10^{-5} due mostly to ingestion of uranium-234 and uranium-238. Total risk for the resident child from groundwater was 2.0×10^{-6} due mostly to ingestion of the same CPCs. The HI for the adult farmer was less than 1.0, but for the child was 1.7 due to potential ingestion of uranium total in groundwater.

Risks and hazards associated with exposure to contaminants in homegrown produce for the RME farmer and resident child are given in Table B.3.1-20(a) and B.3.1-20(b), respectively (Attachment B.III). The total risk associated with homegrown produce for the RME farmer was 2.6×10^{-6} and for the child was 2.1×10^{-6}. This was mostly due to the estimated uptake of radium-226, strontium-90, uranium 235/236, and arsenic in produce. HIs were below 1.0 for both receptors.

Risks and hazards associated with exposure to contaminants in beef and milk for the RME farmer and resident child are given in Table B.3.1-21(a) and B.3.1-21(b), respectively (Attachment B.III). The risk associated with beef and milk for the farmer was 7.6×10^{-6} and for the child was 1.4×10^{-6}. Total HIs were below 1.0 for both receptors.

CT estimates of risk and hazard for the future on-property farmer associated with exposures to surface soil, groundwater contaminated by the Active Flyash Pile, homegrown produce, and beef and milk are given in Tables B.3.1-22, B.3.1-23, B.3.1-24 and B.3.1-25, respectively (Attachment B.III). Risks associated with surface soil were 1.3×10^{-7}. Risks exceeding 1.0×10^{-6} were associated with exposures to groundwater (2.8×10^{-6}) due primarily to the presence of uranium-238. Total risk associated with ingestion of homegrown produce and beef and milk is 1.4×10^{-6} and 3.6×10^{-7}, respectively. The greatest proportion of all these risks were due to the estimated presence of uranium-238 in groundwater dust. All HIs were below 1.0.

B.3.1.4.4 Future Great Miami River User

Risk and hazards to the users of the Great Miami River were determined under three exclusive users: recreational, agricultural, and residential. Risks and hazards to the recreational user of the Great Miami River exposed to CPCs in surface water are presented in Table B.3.1-26(a) (Attachment B.III). Total risk from surface water to this receptor is 1.4×10^{-9} due to ingestion of fish containing arsenic. Total hazard was less than 1.0. Risk and hazards to the agricultural user of the Great Miami River are present in Tables B.3.1-26(b) and B.3.1-26(c) (Attachment B.III). Total risk and hazard associated with ingestion of contaminated beef and milk is 5.5×10^{-10}. Total risk and hazard associated with ingestion of contaminated produce is 3.0×10^{-9}. Risk associated with ingestion of produce containing estimated containing estimated concentration of arsenic was the primary contaminant during risk. Total hazard was less than 1.0. Risks and hazards to the residential user of the Great Miami River are presented in Table B.3.1-26(d) (Attachment B.III). Total risk associated with direct contact exposures to river water (inhalation, ingestion, and dermal contact) was 7.7×10^{-9} due mostly to the ingestion of estimated concentrations of arsenic in surface water. The total hazard for this receptor is less than 1.0.

B.3.1.5 Risks Due to Estimated Radium-222 Emission

Ambient radon emissions potentially associated with the Active Flyash Pile, estimated as described in Section B.2.0, are summarized in Table B.3.1-27 for each receptor. Risks that would result at the

TABLE B.3.1-27
ACTIVE FLYASH PILE
RISKS DUE TO ESTIMATED RN-222 EMISSION

	Subunit			Background		
	Maximum RN-222 Air Concentration (pCi/m3)*	Intake (pCi)	Risk	Background RN-222 Air Concentration (pCi/m3)**	Intake (pCi)	Risk
Current Trespassing Youth	1.8E+00	3.7E+03	2.9E-08	3.6E-01	7.4E+02	5.7E-09
Current/Future Off-Property Farmer	1.3E-01	1.6E+04	1.2E-07	2.6E-02	3.0E+03	2.3E-08
Current/Future Off-Property Child	1.3E-01	2.8E+02	2.2E-09	2.6E-02	5.5E+01	4.3E-10
Current Groundskeeper	1.8E+00	3.2E+04	2.4E-07	3.6E-01	6.2E+03	4.8E-08
Future Expanded Trespasser (Adult + Child)	1.8E+00	5.9E+03	4.5E-08	3.6E-01	1.2E+03	8.9E-09
Future, RME On-Property Farmer	1.6E+00	1.9E+05	1.5E-06	3.2E-01	3.7E+04	2.9E-07
Future, CT On-Property Farmer	1.6E+00	1.4E+04	1.1E-07	3.2E-01	2.7E+03	2.1E-08
Future On-Property Child	1.6E+00	3.4E+03	2.6E-08	3.2E-01	6.7E+02	5.2E-09

*Represents the maximum surface soil Ra-226 hit of 4.6 pCi/g.
**Assumes RA-226 concentration is 1.228 pCi/g in surface soil and 0.78 pCi/g in subsurface soil.

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Active Flyash Pile assuming radon emissions were equivalent to what would naturally occur if radium-226 were present at background concentrations are presented for comparison. The future on-property RME farmer is associated with a risk of 1.5×10^{-6}.

B.3.1.6 Summary of the Active Flyash Pile

Tables B.3.1-28 and B.3.1-29 summarize risk and hazard, respectively, associated with the Active Flyash Pile for all receptors assuming current land use. Exposure of the trespassing youth and groundskeeper to contaminated surface soil were associated with carcinogenic risks greater than 1.0×10^{-6}. Total carcinogenic risk to the trespassing youth was 2.6×10^{-5} due primarily to radium-226, radium-228, thorium-228, and thorium-232 in soil via external radiation, and to arsenic in soil via dermal contact. Exposure via the soil pathway contributed the greatest portion of total risk which was 81.67 percent. Total carcinogenic risk to the groundskeeper was 8.0×10^{-5} due mostly from external radiation of radium-226, radium-228, thorium-228, and thorium-232 in soil and dermal contact with arsenic in soil. Exposure via the soil pathway contributed the greatest portion of total risk which was 99.69 percent. No exposures resulted in HIs exceeding 1.0.

Tables B.3.1-30 and B.3.1-31 summarize risks and hazards, respectively, associated with the Active Flyash Pile for receptors assuming future land use. The greatest risks associated with the Active Flyash Pile are from direct contact with surface soil and groundwater. Total estimated risk to the expanded trespasser was 4.9×10^{-5} due mostly to the estimated presence of radium-226, radium-228, thorium-228, thorium-232, and arsenic in surface soil which accounted for approximately 25, 8, 19, 21, and 11 percent of the total risk to this receptor, respectively.

Total estimated risk to the off-property farmer exceeded the 1.0×10^{-6} level due mostly to direct exposure to the estimated future concentrations of uranium-234 and uranium-238 in groundwater which together accounted for about 55 percent of total risk to this receptor and homegrown produce irrigated with contaminated groundwater containing radium-226, strontium-90, and uranium-235/236 which accounted for 27 percent of the total receptor risk.

Total estimated risks to future on-property residents were greater than 1.0×10^{-6}. Total risks to the RME farmer and child were 8.4×10^{-5} and 5.7×10^{-6}, respectively, due mostly to the presence of uranium-234 uranium-238 in groundwater which accounted for about 54 and 34 percent, respectively, of total risk to this receptor and homegrown produce irrigated with contaminated groundwater

TABLE B.3.1-28
CURRENT LAND USE
ACTIVE FLYASH PILE
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Soil	CS-137	3.9E-07	1.88%	1.54%	1.5E-12	0.00%	0.00%	2.7E-14	0.00%	0.00%	N/A		
	NP-237	5.2E-07	2.49%	2.04%	1.4E-08	8.00%	2.88%	2.5E-10	3.29%	0.38%	N/A		
	PU-238	2.5E-09	0.01%	0.01%	2.4E-09	1.37%	0.49%	4.3E-11	0.56%	0.07%	N/A		
	PU-239/240	1.2E-09	0.01%	0.00%	1.1E-09	0.63%	0.23%	2.0E-11	0.26%	0.03%	N/A		
	RA-226	6.0E-06	28.49%	23.27%	2.8E-09	1.62%	0.58%	5.1E-11	0.67%	0.08%	N/A		
	RA-228	2.0E-06	9.42%	7.69%	1.9E-10	0.11%	0.04%	3.5E-12	0.05%	0.01%	N/A		
	SR-90	1.9E-09	0.01%	0.01%	2.4E-11	0.01%	0.01%	4.4E-13	0.01%	0.00%	N/A		
	TH-228	4.6E-06	21.86%	17.85%	2.6E-08	14.88%	5.35%	4.7E-10	6.12%	0.71%	N/A		
	TH-230	2.8E-09	0.01%	0.01%	8.9E-09	5.18%	1.86%	1.6E-10	2.13%	0.25%	N/A		
	TH-232	4.9E-06	23.29%	19.02%	2.6E-08	14.92%	5.37%	4.7E-10	6.14%	0.71%	N/A		
	U-234	2.7E-09	0.01%	0.01%	8.1E-09	4.70%	1.69%	1.5E-10	1.93%	0.22%	N/A		
	U-235/236	8.3E-09	0.04%	0.03%	3.5E-10	0.20%	0.07%	6.3E-12	0.08%	0.01%	N/A		
	U-238	3.3E-08	0.16%	0.13%	1.6E-08	9.39%	3.38%	2.9E-10	3.87%	0.45%	N/A		
	Total Radiologic Risk	1.8E-05	87.68%	71.61%	1.1E-07	61.02%	21.95%	1.9E-09	25.12%	2.89%			
	Arsenic	2.1E-06	10.13%	8.27%	6.5E-08	37.85%	13.61%	5.5E-09	72.70%	8.37%	N/A		
	Beryllium	4.3E-07	2.08%	1.70%	1.9E-09	1.11%	0.40%	1.6E-10	2.13%	0.25%	N/A		
	Benzo(a)anthracene	1.7E-09	0.01%	0.01%	3.3E-12	0.00%	0.00%	2.8E-13	0.00%	0.00%	N/A		
	Benzo(a)pyrene	1.9E-08	0.09%	0.07%	3.6E-11	0.02%	0.01%	3.0E-12	0.04%	0.00%	N/A		
	Benzo(b)fluoranthene	2.8E-09	0.01%	0.01%	5.3E-12	0.00%	0.00%	4.5E-13	0.01%	0.00%	N/A		
	Total Chemical Risk	2.6E-06	12.32%	10.06%	6.7E-08	38.98%	14.02%	5.7E-09	74.88%	8.62%			
	TOTAL	2.1E-05	100.00%	81.67%	1.7E-07	100.00%	35.97%	7.6E-09	100.00%	11.52%			
Surface Water	NP-237	1.2E-07	17.41%	0.47%	N/A			N/A			N/A		
	PU-238	8.2E-10	0.12%	0.00%	N/A			N/A			N/A		
	PU-239/240	3.9E-10	0.06%	0.00%	N/A			N/A			N/A		
	RA-226	1.7E-08	2.51%	0.07%	N/A			N/A			N/A		
	RA-228	1.5E-09	0.22%	0.01%	N/A			N/A			N/A		
	SR-90	7.8E-10	0.11%	0.00%	N/A			N/A			N/A		
	U-234	1.8E-08	2.59%	0.07%	N/A			N/A			N/A		
	U-235/236	8.0E-10	0.12%	0.00%	N/A			N/A			N/A		
	U-238	3.1E-08	4.53%	0.12%	N/A			N/A			N/A		
	Total Radiologic Risk	1.9E-07	27.67%	0.75%									
	Arsenic	4.3E-07	61.45%	1.66%	N/A			N/A			N/A		
	Beryllium	7.5E-08	10.88%	0.29%	N/A			N/A			N/A		
	Total Chemical Risk	5.0E-07	72.33%	1.96%				N/A			N/A		
	TOTAL	6.9E-07	100.00%	2.71%									
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A		
	Total	N/A			N/A			N/A			N/A		
Sediment	NP-237	1.7E-07	4.19%	0.65%	N/A			N/A			N/A		
	PU-238	5.9E-10	0.01%	0.00%	N/A			N/A			N/A		
	PU-239/240	2.8E-10	0.01%	0.00%	N/A			N/A			N/A		
	RA-226	2.0E-06	49.86%	7.73%	N/A			N/A			N/A		
	RA-228	6.6E-07	16.58%	2.57%	N/A			N/A			N/A		
	SR-90	6.0E-10	0.02%	0.00%	N/A			N/A			N/A		
	U-234	2.0E-10	0.01%	0.00%	N/A			N/A			N/A		
	U-235/236	2.5E-09	0.06%	0.01%	N/A			N/A			N/A		
	U-238	8.6E-09	0.22%	0.03%	N/A			N/A			N/A		
	Total Radiologic Risk	2.8E-06	70.95%	11.01%									
	Arsenic	1.0E-06	25.60%	3.97%	N/A			N/A			N/A		
	Beryllium	1.4E-07	3.45%	0.53%	N/A			N/A			N/A		
	Total Chemical Risk	1.2E-06	29.05%	4.51%									
	TOTAL	4.0E-06	100.00%	15.51%									

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TABLE B.3.1-28
(continued)

Medium	Parameter	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Soil	CS-137	1.5E-06	1.86%	1.85%	N/A			N/A			N/A		
	NP-237	2.0E-06	2.54%	2.54%	N/A			N/A			N/A		
	PU-238	1.9E-08	0.02%	0.02%	N/A			N/A			N/A		
	PU-239/240	8.8E-09	0.01%	0.01%	N/A			N/A			N/A		
	RA-226	2.2E-05	28.28%	28.19%	N/A			N/A			N/A		
	RA-228	7.4E-06	9.30%	9.27%	N/A			N/A			N/A		
	SR-90	1.4E-08	0.02%	0.02%	N/A			N/A			N/A		
	TH-228	1.7E-05	21.59%	21.53%	N/A			N/A			N/A		
	TH-230	2.3E-08	0.03%	0.03%	N/A			N/A			N/A		
	TH-232	1.8E-05	23.02%	22.95%	N/A			N/A			N/A		
	U-234	2.2E-08	0.03%	0.03%	N/A			N/A			N/A		
	U-235/236	3.2E-08	0.04%	0.04%	N/A			N/A			N/A		
	U-238	1.5E-07	0.18%	0.18%	N/A			N/A			N/A		
	Total Radiologic Risk	6.9E-05	86.93%	86.66%									
	Arsenic	8.3E-06	10.46%	10.42%	N/A			N/A			N/A		
	Beryllium	2.0E-06	2.48%	2.48%	N/A			N/A			N/A		
	Benzo(a)anthracene	7.9E-09	0.01%	0.01%	N/A			N/A			N/A		
	Benzo(a)pyrene	8.6E-08	0.11%	0.11%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	1.3E-08	0.02%	0.02%	N/A			N/A			N/A		
	Total Chemical Risk	1.0E-05	13.07%	13.03%									
	TOTAL	7.9E-05	100.00%	99.69%									
Surface Water	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiologic Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	TOTAL												
GMR Surface Water	Arsenic	N/A			1.4E-09	100.00%	100.00%	7.7E-09	100.00%	100.00%	N/A		
	Total	N/A			1.4E-09	100.00%	100.00%	7.7E-09	100.00%	100.00%	N/A		
Sediment	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiologic Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	TOTAL												

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TABLE B.3.1-28
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	CS-137	N/A			*4.0E-11*	*0.03%*	*0.01%*	2.8E-12	0.01%	0.00%	N/A		
	NP-237	N/A			*1.3E-09*	*0.96%*	*0.28%*	9.5E-11	0.21%	0.14%	N/A		
	PU-238	N/A			*1.7E-10*	*0.12%*	*0.04%*	1.2E-11	0.03%	0.02%	N/A		
	PU-239/240	N/A			*8.4E-11*	*0.06%*	*0.02%*	5.9E-12	0.01%	0.01%	N/A		
	RA-226	N/A			*4.1E-09*	*2.89%*	*0.85%*	2.9E-10	0.65%	0.44%	N/A		
	RA-228	N/A			*3.5E-10*	*0.25%*	*0.07%*	2.5E-11	0.06%	0.04%	N/A		
	SR-90	N/A			*2.0E-10*	*0.14%*	*0.04%*	1.4E-11	0.03%	0.02%	N/A		
	TH-228	N/A			*2.3E-10*	*0.16%*	*0.05%*	1.6E-11	0.04%	0.02%	N/A		
	TH-230	N/A			*5.2E-11*	*0.04%*	*0.01%*	3.7E-12	0.01%	0.01%	N/A		
	TH-232	N/A			*5.2E-10*	*0.37%*	*0.11%*	3.6E-11	0.08%	0.06%	N/A		
	U-234	N/A			*6.4E-11*	*0.05%*	*0.01%*	4.5E-12	0.01%	0.01%	N/A		
	U-235/236	N/A			*2.8E-12*	*0.00%*	*0.00%*	2.0E-13	0.00%	0.00%	N/A		
	U-238	N/A			*1.1E-10*	*0.08%*	*0.02%*	7.8E-12	0.02%	0.01%			
	Total Radiologic Risk				*7.2E-09*	*5.15%*	*1.51%*	5.1E-10	1.15%	0.77%			
	Arsenic	N/A			1.2E-07	*84.85%*	*24.89%*	3.9E-08	88.43%	59.59%	N/A		
	Beryllium	N/A			1.3E-08	*9.51%*	*2.79%*	4.4E-09	9.91%	6.68%	N/A		
	Benzo(a)anthracene	N/A			5.3E-11	*0.04%*	*0.01%*	1.7E-11	0.04%	0.03%	N/A		
	Benzo(a)pyrene	N/A			5.6E-10	*0.40%*	*0.12%*	1.8E-10	0.42%	0.28%	N/A		
	Benzo(b)fluoranthene	N/A			8.4E-11	*0.06%*	*0.02%*	2.8E-11	0.06%	0.04%	N/A		
	Total Chemical Risk				1.3E-07	*94.85%*	*27.83%*	4.4E-08	98.85%	66.62%			
	TOTAL				*1.4E-07*	100.00%	*29.34%*	4.4E-08	100.00%	67.39%			
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (Dust Affected)	CS-137	N/A			1.9E-10	0.41%	*0.04%*	2.4E-11	0.21%	0.04%	1.9E-09	0.41%	0.41%
	NP-237	N/A			6.1E-12	0.01%	*0.00%*	4.7E-13	0.00%	0.00%	6.1E-11	0.01%	0.01%
	PU-238	N/A			9.7E-15	0.00%	*0.00%*	1.0E-15	0.00%	0.00%	9.7E-14	0.00%	0.00%
	PU-239/240	N/A			5.1E-15	0.00%	*0.00%*	5.4E-16	0.00%	0.00%	5.1E-14	0.00%	0.00%
	RA-226	N/A			7.2E-10	1.54%	*0.15%*	1.3E-10	1.07%	0.19%	7.2E-09	1.54%	1.54%
	RA-228	N/A			4.1E-11	0.09%	*0.01%*	7.2E-12	0.06%	0.01%	4.1E-10	0.09%	0.09%
	SR-90	N/A			1.6E-10	0.34%	*0.03%*	2.9E-11	0.25%	0.04%	1.6E-09	0.34%	0.34%
	TH-228	N/A			3.1E-13	0.00%	*0.00%*	4.8E-14	0.00%	0.00%	3.1E-12	0.00%	0.00%
	TH-230	N/A			3.3E-13	0.00%	*0.00%*	5.2E-14	0.00%	0.00%	3.3E-12	0.00%	0.00%
	TH-232	N/A			3.3E-12	0.01%	*0.00%*	5.2E-13	0.00%	0.00%	3.3E-11	0.01%	0.01%
	U-234	N/A			8.9E-12	0.02%	*0.00%*	1.6E-12	0.01%	0.00%	8.9E-11	0.02%	0.02%
	U-235/236	N/A			4.0E-13	0.00%	*0.00%*	7.2E-14	0.00%	0.00%	4.0E-12	0.00%	0.00%
	U-238	N/A			1.6E-11	0.03%	*0.00%*	2.8E-12	0.02%	0.00%	1.6E-10	0.03%	0.03%
	Total Radiologic Risk				1.1E-09	2.45%	*0.24%*	1.9E-10	1.64%	0.29%	1.2E-08	2.45%	2.45%
	Arsenic	N/A			4.2E-08	88.56%	*8.65%*	9.8E-09	83.14%	14.80%	4.2E-07	88.55%	88.55%
	Beryllium	N/A			1.5E-09	3.27%	*0.32%*	2.4E-10	2.05%	0.37%	1.5E-08	3.26%	3.26%
	Benzo(a)anthracene	N/A			7.8E-11	0.17%	*0.02%*	4.5E-11	0.38%	0.07%	7.9E-10	0.17%	0.17%
	Benzo(a)pyrene	N/A			2.3E-09	4.82%	*0.47%*	1.3E-09	11.07%	1.97%	2.3E-08	4.83%	4.83%
	Benzo(b)fluoranthene	N/A			3.5E-10	0.74%	*0.07%*	2.0E-10	1.71%	0.30%	3.5E-09	0.74%	0.74%
	Total Chemical Risk				4.6E-08	97.55%	*9.53%*	1.2E-08	98.36%	17.51%	4.6E-07	97.55%	97.55%
	TOTAL				4.7E-08	100.00%	*9.77%*	1.2E-08	100.00%	17.80%	4.7E-07	100.00%	100.00%
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Total												
Ambient Radon		2.9E-08			1.2E-07			2.2E-09			N/A		
ALL MEDIA		**2.6E-05**			***4.8E-07***			**6.6E-08**			**4.7E-07**		

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TABLE B.3.1-28
(continued)

Medium	Parameter	Grounds-keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	CS-137	N/A			N/A			N/A			N/A		
	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238												
	Total Radiologic Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	TOTAL												
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			3.0E-09	100.00%	84.43%
	Total										3.0E-09	100.00%	84.43%
Beef/Milk (Dust Affected)	CS-137	N/A			N/A			N/A			N/A		
	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238												
	Total Radiologic Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	TOTAL												
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			5.5E-10	100.00%	15.57%
	Total										5.5E-10	100.00%	15.57%
Ambient Radon		2.4E-07			N/A			N/A			N/A		
ALL MEDIA		8.0E-05			1.37E-09			7.67E-09			3.53E-09		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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TABLE B.3.1-29
CURRENT LAND USE
ACTIVE FLYASH PILE
SUMMARY OF TOTAL NON-CARCINOGENIC HAZARD

Medium	Parameter	Trespassing Youth	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Farmer	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard	User of Milk and Meat	% Total Medium Hazard	% Total Receptor Hazard
Soil	Arsenic	2.3E-02	74.88%	64.68%	N/D			N/D			N/A		
	Beryllium	1.2E-04	0.38%	0.33%	N/D			N/D			N/A		
	Thallium	7.7E-03	24.74%	21.37%	N/D			N/D			N/A		
	Total	3.1E-02	100.00%	86.39%									
Surface Water	Arsenic	4.7E-03	96.72%	13.17%	N/A			N/A			N/A		
	Beryllium	1.6E-04	3.28%	0.45%	N/A			N/A			N/A		
	Total	4.9E-03	100.00%	13.61%									
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A		
	Total												
Sediment	Arsenic	1.1E-02	41.54%	31.44%	N/A			N/A			N/A		
	Beryllium	1.6E-02	58.46%	44.25%	N/A			N/A			N/A		
	Total	2.7E-02	100.00%	75.69%									
Homegrown Produce (Dust Affected)	Arsenic	N/A			2.3E-04	89.64%	36.77%	8.7E-04	89.64%	41.11%	N/A		
	Beryllium	N/A			6.2E-07	0.25%	0.10%	2.4E-06	0.25%	0.11%	N/A		
	Thallium	N/A			2.6E-05	10.11%	4.15%	9.9E-05	10.11%	4.64%	N/A		
	Total				2.5E-04	100.00%	41.02%	9.7E-04	100.00%	45.86%			
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (Dust Affected)	Arsenic	N/A			7.9E-05	21.67%	12.78%	2.2E-04	18.86%	10.21%	7.9E-04	21.63%	21.63%
	Beryllium	N/A			7.1E-08	0.02%	0.01%	1.3E-07	0.01%	0.01%	7.1E-07	0.02%	0.02%
	Thallium	N/A			2.9E-04	78.31%	46.19%	9.3E-04	81.13%	43.93%	2.9E-03	78.35%	78.35%
	Total				3.6E-04	100.00%	58.98%	1.2E-03	100.00%	54.14%	3.7E-03	100.00%	100.00%
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Total												
ALL MEDIA		**3.6E-02**			**6.2E-04**			**2.1E-03**			**3.7E-03**		

000244

TABLE B.3.1-29
(continued)

Medium	Parameter	Grounds-keeper	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Resid. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Soil	Arsenic	4.3E-02	73.50%	73.50%	N/A			N/A			N/A		
	Beryllium	7.5E-03	12.65%	12.65%	N/A			N/A			N/A		
	Thallium	8.2E-03	13.85%	13.85%	N/A			N/A			N/A		
	Total	5.9E-02	100.00%	100.00%									
Surface Water	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Total												
GMR Surface Water	Arsenic	N/A			6.1E-06	100.00%	100.00%	1.5E-05	100.00%	68.51%	N/A		
	Total				6.1E-06	100.00%	100.00%	1.5E-05	100.00%	68.51%			
Sediment	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Total												
Homegrown Produce (Dust Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Thallium	N/A			N/A			N/A			N/A		
	Total												
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			5.7E-06	100.00%	26.59%	5.7E-06	100.00%	84.43%
	Total							5.7E-06	100.00%	26.59%	5.7E-06	100.00%	84.43%
Beef/Milk (Dust Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Thallium	N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			1.0E-06	100.00%	4.90%	1.0E-06	100.00%	15.57%
	Total							1.0E-06	100.00%	4.90%	1.0E-06	100.00%	15.57%
ALL MEDIA		**5.9E-02**			**6.1E-06**			**2.1E-05**			**6.7E-06**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - Not determined because toxicity data are not available.

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TABLE B.3.1-30
ACTIVE FLYASH PILE
FUTURE LAND USE
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137	8.2E-07	1.84%	1.66%	1.5E-12	0.00%	0.00%	1.5E-12	0.00%	0.00%	2.7E-14	0.00%	0.00%	2.7E-14	0.00%	0.00%	1.5E-11	0.00%	0.00%
	NP-237	1.1E-06	2.46%	2.22%	1.4E-08	8.00%	0.13%	1.4E-08	8.00%	0.13%	2.5E-10	3.29%	0.03%	2.5E-10	3.29%	0.03%	1.4E-07	8.01%	0.17%
	PU-238	6.1E-09	0.01%	0.01%	2.4E-09	1.37%	0.02%	2.4E-09	1.37%	0.02%	4.3E-11	0.56%	0.01%	4.3E-11	0.56%	0.01%	2.4E-08	1.37%	0.03%
	PU-239/240	2.9E-09	0.01%	0.01%	1.1E-09	0.63%	0.01%	1.1E-09	0.63%	0.01%	2.0E-11	0.26%	0.00%	2.0E-11	0.26%	0.00%	1.1E-08	0.63%	0.01%
	RA-226	1.2E-05	27.93%	25.25%	2.8E-09	1.62%	0.03%	2.8E-09	1.62%	0.03%	5.1E-11	0.67%	0.01%	5.1E-11	0.67%	0.01%	2.8E-08	1.62%	0.03%
	RA-228	4.1E-06	9.22%	8.33%	1.9E-10	0.11%	0.00%	1.9E-10	0.11%	0.00%	3.5E-12	0.05%	0.00%	3.5E-12	0.05%	0.00%	1.9E-09	0.11%	0.00%
	SR-90	5.2E-09	0.01%	0.01%	2.4E-11	0.01%	0.00%	2.4E-11	0.01%	0.00%	4.4E-13	0.01%	0.00%	4.4E-13	0.01%	0.00%	2.4E-10	0.01%	0.00%
	TH-228	9.6E-06	21.37%	19.33%	2.6E-08	14.88%	0.24%	2.6E-08	14.88%	0.24%	4.7E-10	6.12%	0.06%	4.7E-10	6.12%	0.06%	2.6E-07	14.87%	0.31%
	TH-230	5.0E-09	0.01%	0.01%	8.9E-09	5.18%	0.08%	8.9E-09	5.18%	0.08%	1.6E-10	2.13%	0.02%	1.6E-10	2.13%	0.02%	9.0E-08	5.18%	0.11%
	TH-232	1.0E-05	22.79%	20.60%	2.6E-08	14.92%	0.24%	2.6E-08	14.92%	0.24%	4.7E-10	6.14%	0.06%	4.7E-10	6.14%	0.06%	2.6E-07	14.94%	0.31%
	U-234	5.1E-09	0.01%	0.01%	8.1E-09	4.70%	0.08%	8.1E-09	4.70%	0.08%	1.5E-10	1.93%	0.02%	1.5E-10	1.93%	0.02%	8.1E-08	4.70%	0.10%
	U-235/236	1.7E-08	0.04%	0.04%	3.5E-10	0.20%	0.00%	3.5E-10	0.20%	0.00%	6.3E-12	0.08%	0.00%	6.3E-12	0.08%	0.00%	3.5E-09	0.20%	0.00%
	U-238	6.8E-08	0.15%	0.14%	1.6E-08	9.39%	0.15%	1.6E-08	9.39%	0.15%	2.9E-10	3.87%	0.04%	2.9E-10	3.87%	0.04%	1.6E-07	9.39%	0.19%
	Total Radiological Risk	3.8E-05	85.84%	77.62%	1.1E-07	61.02%	0.98%	1.1E-07	61.02%	0.98%	1.9E-09	25.12%	0.26%	1.9E-09	25.12%	0.26%	1.1E-06	61.04%	1.27%
	Arsenic	5.3E-06	11.89%	10.75%	6.5E-08	37.85%	0.61%	6.5E-08	37.85%	0.61%	5.5E-09	72.70%	0.76%	5.5E-09	72.70%	0.76%	6.6E-07	37.82%	0.78%
	Beryllium	9.6E-07	2.15%	1.95%	1.9E-09	1.11%	0.02%	1.9E-09	1.11%	0.02%	1.6E-10	2.13%	0.02%	1.6E-10	2.13%	0.02%	1.9E-08	1.11%	0.02%
	Benzo(a)anthracene	3.9E-09	0.01%	0.01%	3.3E-12	0.00%	0.00%	3.3E-12	0.00%	0.00%	2.8E-13	0.00%	0.00%	2.8E-13	0.00%	0.00%	3.3E-11	0.00%	0.00%
	Benzo(a)pyrene	4.2E-08	0.09%	0.08%	3.6E-11	0.02%	0.00%	3.6E-11	0.02%	0.00%	3.0E-12	0.04%	0.00%	3.0E-12	0.04%	0.00%	3.6E-10	0.02%	0.00%
	Benzo(b)fluoranthene	6.3E-09	0.01%	0.01%	5.3E-12	0.00%	0.00%	5.3E-12	0.00%	0.00%	4.5E-13	0.01%	0.00%	4.5E-13	0.01%	0.00%	5.3E-11	0.00%	0.00%
	Total Chemical Risk	6.3E-06	14.16%	12.80%	6.7E-08	38.98%	0.62%	6.7E-08	38.98%	0.62%	5.7E-09	74.88%	0.79%	5.7E-09	74.88%	0.79%	6.7E-07	38.96%	0.81%
	Total	4.5E-05	100.00%	90.42%	1.7E-07	100.00%	1.60%	1.7E-07	100.00%	1.60%	7.6E-09	100.00%	1.05%	7.6E-09	100.00%	1.05%	1.7E-06	100.00%	2.07%
Groundwater	NP-237	N/A			2.7E-07	4.24%	2.52%	2.7E-07	4.24%	2.52%	1.2E-08	4.23%	1.61%	1.2E-08	4.23%	1.61%	3.4E-09	0.01%	0.00%
	SR-90	N/A			9.2E-08	1.43%	0.85%	9.2E-08	1.43%	0.85%	3.9E-09	1.43%	0.54%	3.9E-09	1.43%	0.54%	9.6E-07	2.04%	1.16%
	U-234	N/A			2.0E-06	31.56%	18.74%	2.0E-06	31.56%	18.74%	8.7E-08	31.49%	12.01%	8.7E-08	31.49%	12.01%	1.6E-05	32.87%	18.58%
	U-235/236	N/A			1.1E-07	1.69%	1.00%	1.1E-07	1.69%	1.00%	4.6E-09	1.68%	0.64%	4.6E-09	1.68%	0.64%	8.2E-07	1.74%	0.99%
	U-238	N/A			3.9E-06	61.02%	36.24%	3.9E-06	61.02%	36.24%	1.7E-07	60.88%	23.21%	1.7E-07	60.88%	23.21%	3.0E-05	63.34%	35.81%
	0.0E+00				0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Radiological Risk				6.4E-06	99.94%	59.35%	6.4E-06	99.94%	59.35%	2.7E-07	99.72%	38.01%	2.7E-07	99.72%	38.01%	4.7E-05	100.00%	56.53%
	Arsenic	N/A			3.6E-09	0.06%	0.03%	3.6E-09	0.06%	0.03%	7.2E-10	0.26%	0.10%	7.2E-10	0.26%	0.10%	8.8E-15	0.00%	0.00%
	Beryllium	N/A			3.3E-10	0.01%	0.00%	3.3E-10	0.01%	0.00%	6.6E-11	0.02%	0.01%	6.6E-11	0.02%	0.01%	4.3E-16	0.00%	0.00%
	Total Chemical Risk				3.9E-09	0.06%	0.04%	3.9E-09	0.06%	0.04%	7.8E-10	0.28%	0.11%	7.8E-10	0.28%	0.11%	9.3E-15	0.00%	0.00%
	Total				6.4E-06	100.00%	59.38%	6.4E-06	100.00%	59.38%	2.8E-07	100.00%	38.12%	2.8E-07	100.00%	38.12%	4.7E-05	100.00%	56.53%
Sediment	NP-237	1.7E-07	4.16%	0.34%	N/A			N/A			N/A			N/A			N/A		
	PU-238	6.2E-10	0.02%	0.00%	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	3.0E-10	0.01%	0.00%	N/A			N/A			N/A			N/A			N/A		
	RA-226	2.0E-06	49.45%	4.00%	N/A			N/A			N/A			N/A			N/A		
	RA-228	6.6E-07	16.44%	1.33%	N/A			N/A			N/A			N/A			N/A		
	SR-90	6.3E-10	0.02%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-234	2.1E-10	0.01%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-235/236	2.5E-09	0.06%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-238	8.6E-09	0.22%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Total Radiologic Risk	2.8E-06	70.36%	5.69%															
	Arsenic	1.0E-06	26.05%	2.11%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	1.4E-07	3.59%	0.29%	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	1.2E-06	29.64%	2.40%															
	TOTAL	4.0E-06	100.00%	8.09%															

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TABLE B.3.1-30
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137	1.1E-12	0.00%	0.00%	2.8E-13	0.00%	0.00%	N/A			N/A			N/A		
	NP-237	1.0E-08	8.01%	0.21%	2.5E-09	3.30%	0.04%	N/A			N/A			N/A		
	PU-238	1.8E-09	1.37%	0.04%	4.3E-10	0.56%	0.01%	N/A			N/A			N/A		
	PU-239/240	8.1E-10	0.63%	0.02%	2.0E-10	0.26%	0.00%	N/A			N/A			N/A		
	RA-226	2.1E-09	1.62%	0.04%	5.1E-10	0.67%	0.01%	N/A			N/A			N/A		
	RA-228	1.4E-10	0.11%	0.00%	3.5E-11	0.05%	0.00%	N/A			N/A			N/A		
	SR-90	1.8E-11	0.01%	0.00%	4.4E-12	0.01%	0.00%	N/A			N/A			N/A		
	TH-228	1.9E-08	14.87%	0.39%	4.7E-09	6.12%	0.08%	N/A			N/A			N/A		
	TH-230	6.6E-09	5.18%	0.14%	1.6E-09	2.13%	0.03%	N/A			N/A			N/A		
	TH-232	1.9E-08	14.94%	0.40%	4.7E-09	6.15%	0.08%	N/A			N/A			N/A		
	U-234	6.0E-09	4.70%	0.12%	1.5E-09	1.93%	0.03%	N/A			N/A			N/A		
	U-235/236	2.6E-10	0.20%	0.01%	6.3E-11	0.08%	0.00%	N/A			N/A			N/A		
	U-238	1.2E-08	9.39%	0.25%	2.9E-09	3.87%	0.05%	N/A			N/A			N/A		
	Total Radiological Risk	7.8E-08	61.04%	1.62%	1.9E-08	25.14%	0.33%									
	Arsenic	4.8E-08	37.82%	1.00%	5.5E-08	72.68%	0.97%	N/A			N/A			N/A		
	Beryllium	1.4E-09	1.11%	0.03%	1.6E-09	2.13%	0.03%	N/A			N/A			N/A		
	Benzo(a)anthracene	2.4E-12	0.00%	0.00%	2.8E-12	0.00%	0.00%	N/A			N/A			N/A		
	Benzo(a)pyrene	2.6E-11	0.02%	0.00%	3.0E-11	0.04%	0.00%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	3.9E-12	0.00%	0.00%	4.5E-12	0.01%	0.00%	N/A			N/A			N/A		
	Total Chemical Risk	5.0E-08	38.96%	1.03%	5.7E-08	74.86%	1.00%									
	Total	1.3E-07	100.00%	2.65%	7.6E-08	100.00%	1.33%									
Groundwater	NP-237	2.0E-10	0.01%	0.00%	1.5E-10	0.01%	0.00%	N/A			N/A			N/A		
	SR-90	5.8E-08	2.04%	1.20%	4.1E-08	2.04%	0.72%	N/A			N/A			N/A		
	U-234	9.3E-07	32.87%	19.33%	6.7E-07	32.87%	11.63%	N/A			N/A			N/A		
	U-235/236	5.0E-08	1.74%	1.03%	3.5E-08	1.74%	0.62%	N/A			N/A			N/A		
	U-238	1.8E-06	63.34%	37.25%	1.3E-06	63.34%	22.41%	N/A			N/A			N/A		
	0.0E+00	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%									
	Total Radiological Risk	2.8E-06	100.00%	58.81%	2.0E-06	100.00%	35.38%									
	Arsenic	5.3E-16	0.00%	0.00%	1.8E-15	0.00%	0.00%	N/A			N/A			N/A		
	Beryllium	2.6E-17	0.00%	0.00%	8.6E-17	0.00%	0.00%	N/A			N/A			N/A		
	Total Chemical Risk	5.6E-16	0.00%	0.00%	1.9E-15	0.00%	0.00%									
	Total	2.8E-06	100.00%	58.81%	2.0E-06	100.00%	35.38%									
Sediment	NP-237	N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiologic Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	TOTAL															

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TABLE B.3.1-30
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	1.2E-07	17.41%	0.24%	N/A			N/A			N/A			N/A			N/A		
	PU-238	8.2E-10	0.12%	0.00%	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	3.9E-10	0.06%	0.00%	N/A			N/A			N/A			N/A			N/A		
	RA-226	1.7E-08	2.51%	0.04%	N/A			N/A			N/A			N/A			N/A		
	RA-228	1.5E-09	0.22%	0.00%	N/A			N/A			N/A			N/A			N/A		
	SR-90	7.8E-10	0.11%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-234	1.8E-08	2.59%	0.04%	N/A			N/A			N/A			N/A			N/A		
	U-235/236	8.0E-10	0.12%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-238	3.1E-08	4.53%	0.06%	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	1.9E-07	27.67%	0.39%															
	Arsenic	4.3E-07	61.45%	0.86%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	7.5E-08	10.88%	0.15%	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	5.0E-07	72.33%	1.01%															
	Total	6.9E-07	100.00%	1.40%															
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Homegrown Produce (Fruits and Vegetables, Dust Affected)	CS-137	N/A			4.0E-11	0.03%	0.00%	4.0E-11	0.03%	0.00%	2.8E-12	0.01%	0.00%	2.8E-12	0.01%	0.00%	4.0E-10	0.03%	0.00%
	NP-237	N/A			1.3E-09	0.96%	0.01%	1.3E-09	0.96%	0.01%	9.5E-11	0.21%	0.01%	9.5E-11	0.21%	0.01%	1.4E-08	0.96%	0.02%
	PU-238	N/A			1.7E-10	0.12%	0.00%	1.7E-10	0.12%	0.00%	1.2E-11	0.03%	0.00%	1.2E-11	0.03%	0.00%	1.7E-09	0.12%	0.00%
	PU-239/240	N/A			8.4E-11	0.06%	0.00%	8.4E-11	0.06%	0.00%	5.9E-12	0.01%	0.00%	5.9E-12	0.01%	0.00%	8.4E-10	0.06%	0.00%
	RA-226	N/A			4.1E-09	2.89%	0.04%	4.1E-09	2.89%	0.04%	2.9E-10	0.65%	0.04%	2.9E-10	0.65%	0.04%	4.1E-08	2.89%	0.05%
	RA-228	N/A			3.5E-10	0.25%	0.00%	3.5E-10	0.25%	0.00%	2.5E-11	0.06%	0.00%	2.5E-11	0.06%	0.00%	3.5E-09	0.25%	0.00%
	SR-90	N/A			2.0E-10	0.14%	0.00%	2.0E-10	0.14%	0.00%	1.4E-11	0.03%	0.00%	1.4E-11	0.03%	0.00%	2.0E-09	0.14%	0.00%
	TH-228	N/A			2.3E-10	0.16%	0.00%	2.3E-10	0.16%	0.00%	1.6E-11	0.04%	0.00%	1.6E-11	0.04%	0.00%	2.3E-09	0.16%	0.00%
	TH-230	N/A			5.2E-11	0.04%	0.00%	5.2E-11	0.04%	0.00%	3.7E-12	0.01%	0.00%	3.7E-12	0.01%	0.00%	5.2E-10	0.04%	0.00%
	TH-232	N/A			5.2E-10	0.37%	0.00%	5.2E-10	0.37%	0.00%	3.6E-11	0.08%	0.01%	3.6E-11	0.08%	0.01%	5.2E-09	0.37%	0.01%
	U-234	N/A			6.4E-11	0.05%	0.00%	6.4E-11	0.05%	0.00%	4.5E-12	0.01%	0.00%	4.5E-12	0.01%	0.00%	6.4E-10	0.05%	0.00%
	U-235/236	N/A			2.8E-12	0.00%	0.00%	2.8E-12	0.00%	0.00%	2.0E-13	0.00%	0.00%	2.0E-13	0.00%	0.00%	2.8E-11	0.00%	0.00%
	U-238	N/A			1.1E-10	0.08%	0.00%	1.1E-10	0.08%	0.00%	7.8E-12	0.02%	0.00%	7.8E-12	0.02%	0.00%	1.1E-09	0.08%	0.00%
	Total Radiological Risk				7.2E-09	5.15%	0.07%	7.2E-09	5.15%	0.07%	5.1E-10	1.15%	0.07%	5.1E-10	1.15%	0.07%	7.3E-08	5.15%	0.09%
	Arsenic	N/A			1.2E-07	84.85%	1.11%	1.2E-07	84.85%	1.11%	3.9E-08	88.43%	5.44%	3.9E-08	88.43%	5.44%	1.2E-06	84.85%	1.43%
	Beryllium	N/A			1.3E-08	9.51%	0.12%	1.3E-08	9.51%	0.12%	4.4E-09	9.91%	0.61%	4.4E-09	9.91%	0.61%	1.3E-07	9.51%	0.16%
	Benzo(a)anthracene	N/A			5.3E-11	0.04%	0.00%	5.3E-11	0.04%	0.00%	1.7E-11	0.04%	0.00%	1.7E-11	0.04%	0.00%	5.3E-10	0.04%	0.00%
	Benzo(a)pyrene	N/A			5.6E-10	0.40%	0.01%	5.6E-10	0.40%	0.01%	1.8E-10	0.42%	0.03%	1.8E-10	0.42%	0.03%	5.6E-09	0.40%	0.01%
	Benzo(b)fluoranthene	N/A			8.4E-11	0.06%	0.00%	8.4E-11	0.06%	0.00%	2.8E-11	0.06%	0.00%	2.8E-11	0.06%	0.00%	8.4E-10	0.06%	0.00%
	Total Chemical Risk				1.3E-07	94.85%	1.24%	1.3E-07	94.85%	1.24%	4.4E-08	98.85%	6.09%	4.4E-08	98.85%	6.09%	1.3E-06	94.85%	1.60%
	Total				1.4E-07	100.00%	1.30%	1.4E-07	100.00%	1.30%	4.4E-08	100.00%	6.16%	4.4E-08	100.00%	6.16%	1.4E-06	100.00%	1.69%
Homegrown Produce (Fruits and Vegetables, Groundwater Affected)	NP-237	N/A			8.3E-08	2.77%	0.77%	8.3E-08	2.77%	0.77%	5.8E-09	2.77%	0.81%	5.8E-09	2.77%	0.81%	1.0E-09	0.00%	0.00%
	RA-226	N/A			6.2E-07	20.74%	5.74%	6.2E-07	20.74%	5.74%	4.4E-08	20.73%	6.05%	4.4E-08	20.73%	6.05%	6.5E-06	27.16%	7.81%
	SR-90	N/A			1.6E-06	52.81%	14.61%	1.6E-06	52.81%	14.61%	1.1E-07	52.77%	15.39%	1.1E-07	52.77%	15.39%	1.2E-05	50.36%	14.49%
	U-234	N/A			3.3E-08	1.09%	0.30%	3.3E-08	1.09%	0.30%	2.3E-09	1.09%	0.32%	2.3E-09	1.09%	0.32%	2.5E-07	1.03%	0.30%
	U-235/236	N/A			6.7E-07	22.55%	6.24%	6.7E-07	22.55%	6.24%	4.7E-08	22.55%	6.58%	4.7E-08	22.55%	6.58%	5.2E-06	21.44%	6.17%
	U-238	N/A			0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Radiological Risk				3.0E-06	99.97%	27.66%	3.0E-06	99.97%	27.66%	2.1E-07	99.91%	29.14%	2.1E-07	99.91%	29.14%	2.4E-05	100.00%	28.76%
	Arsenic	N/A			9.1E-10	0.03%	0.01%	9.1E-10	0.03%	0.01%	1.8E-10	0.09%	0.03%	1.8E-10	0.09%	0.03%	3.4E-15	0.00%	0.00%
	Beryllium	N/A			3.5E-11	0.00%	0.00%	3.5E-11	0.00%	0.00%	7.0E-12	0.00%	0.00%	7.0E-12	0.00%	0.00%	7.0E-17	0.00%	0.00%
	Total Chemical Risk				9.4E-10	0.03%	0.01%	9.4E-10	0.03%	0.01%	1.9E-10	0.09%	0.03%	1.9E-10	0.09%	0.03%	3.5E-15	0.00%	0.00%
	Total				3.0E-06	100.00%	27.67%	3.0E-06	100.00%	27.67%	2.1E-07	100.00%	29.17%	2.1E-07	100.00%	29.17%	2.4E-05	100.00%	28.76%

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TABLE B.3.1-30
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															
GMR Surface Water	Arsenic	N/A			N/A			1.4E-09	100.00%	100.00%	7.7E-09	100.00%	100.00%	N/A		
	Total							1.4E-09	100.00%	100.00%	7.7E-09	100.00%	100.00%			
Homegrown Produce (Fruits and Vegetables, Dust Affected)	CS-137	2.2E-11	0.03%	0.00%	2.8E-11	0.01%	0.00%	N/A			N/A			N/A		
	NP-237	7.4E-10	0.96%	0.02%	9.5E-10	0.21%	0.02%	N/A			N/A			N/A		
	PU-238	9.4E-11	0.12%	0.00%	1.2E-10	0.03%	0.00%	N/A			N/A			N/A		
	PU-239/240	4.6E-11	0.06%	0.00%	5.9E-11	0.01%	0.00%	N/A			N/A			N/A		
	RA-226	2.2E-09	2.89%	0.05%	2.9E-09	0.65%	0.05%	N/A			N/A			N/A		
	RA-228	1.9E-10	0.25%	0.00%	2.5E-10	0.06%	0.00%	N/A			N/A			N/A		
	SR-90	1.1E-10	0.14%	0.00%	1.4E-10	0.03%	0.00%	N/A			N/A			N/A		
	TH-228	1.3E-10	0.16%	0.00%	1.6E-10	0.04%	0.00%	N/A			N/A			N/A		
	TH-230	2.9E-11	0.04%	0.00%	3.7E-11	0.01%	0.00%	N/A			N/A			N/A		
	TH-232	2.9E-10	0.37%	0.01%	3.7E-10	0.08%	0.01%	N/A			N/A			N/A		
	U-234	3.5E-11	0.05%	0.00%	4.5E-11	0.01%	0.00%	N/A			N/A			N/A		
	U-235/236	1.6E-12	0.00%	0.00%	2.0E-12	0.00%	0.00%	N/A			N/A			N/A		
	U-238	6.1E-11	0.08%	0.00%	7.9E-11	0.02%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	4.0E-09	5.15%	0.08%	5.1E-09	1.15%	0.09%									
	Arsenic	6.6E-08	84.85%	1.36%	3.9E-07	88.43%	6.89%	N/A			N/A			N/A		
	Beryllium	7.4E-09	9.51%	0.15%	4.4E-08	9.91%	0.77%	N/A			N/A			N/A		
	Benzo(a)anthracene	2.9E-11	0.04%	0.00%	1.8E-10	0.04%	0.00%	N/A			N/A			N/A		
	Benzo(a)pyrene	3.1E-10	0.40%	0.01%	1.9E-09	0.42%	0.03%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	4.6E-11	0.06%	0.00%	2.8E-10	0.06%	0.00%	N/A			N/A			N/A		
	Total Chemical Risk	7.4E-08	94.85%	1.52%	4.4E-07	98.85%	7.70%									
	Total	7.8E-08	100.00%	1.61%	4.5E-07	100.00%	7.79%									
Homegrown Produce (Fruits and Vegetables, Groundwater Affected)	NP-237	5.7E-11	0.00%	0.00%	7.3E-11	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	3.6E-07	27.16%	7.42%	4.6E-07	27.17%	8.05%	N/A			N/A			N/A		
	SR-90	6.7E-07	50.36%	13.77%	8.5E-07	50.35%	14.91%	N/A			N/A			N/A		
	U-234	1.4E-08	1.03%	0.28%	1.7E-08	1.03%	0.31%	N/A			N/A			N/A		
	U-235/236	2.8E-07	21.44%	5.86%	3.6E-07	21.44%	6.35%	N/A			N/A			N/A		
	U-238	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	1.3E-06	100.00%	27.33%	1.7E-06	100.00%	29.61%									
	Arsenic	1.9E-16	0.00%	0.00%	1.1E-15	0.00%	0.00%	N/A			N/A			N/A		
	Beryllium	3.9E-18	0.00%	0.00%	2.3E-17	0.00%	0.00%	N/A			N/A			N/A		
	Total Chemical Risk	1.9E-16	0.00%	0.00%	1.2E-15	0.00%	0.00%									
	Total	1.3E-06	100.00%	27.33%	1.7E-06	100.00%	29.61%									

TABLE B.3.1-30
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Beef/Milk (Dust Affected)	CS-137	N/A			1.9E-10	0.41%	0.00%	1.9E-10	0.41%	0.00%	2.4E-11	0.21%	0.00%	2.4E-11	0.21%	0.00%	1.9E-09	0.41%	0.00%
	NP-237	N/A			6.1E-12	0.01%	0.00%	6.1E-12	0.01%	0.00%	4.7E-13	0.00%	0.00%	4.7E-13	0.00%	0.00%	6.1E-11	0.01%	0.00%
	PU-238	N/A			9.7E-15	0.00%	0.00%	9.7E-15	0.00%	0.00%	1.0E-15	0.00%	0.00%	1.0E-15	0.00%	0.00%	9.7E-14	0.00%	0.00%
	PU-239/240	N/A			5.1E-15	0.00%	0.00%	5.1E-15	0.00%	0.00%	5.4E-16	0.00%	0.00%	5.4E-16	0.00%	0.00%	5.1E-14	0.00%	0.00%
	RA-226	N/A			7.2E-10	1.54%	0.01%	7.2E-10	1.54%	0.01%	1.3E-10	1.07%	0.02%	1.3E-10	1.07%	0.02%	7.2E-09	1.54%	0.01%
	RA-228	N/A			4.1E-11	0.09%	0.00%	4.1E-11	0.09%	0.00%	7.2E-12	0.06%	0.00%	7.2E-12	0.06%	0.00%	4.1E-10	0.09%	0.00%
	SR-90	N/A			1.6E-10	0.34%	0.00%	1.6E-10	0.34%	0.00%	2.9E-11	0.25%	0.00%	2.9E-11	0.25%	0.00%	1.6E-09	0.34%	0.00%
	TH-228	N/A			3.1E-13	0.00%	0.00%	3.1E-13	0.00%	0.00%	4.8E-14	0.00%	0.00%	4.8E-14	0.00%	0.00%	3.1E-12	0.00%	0.00%
	TH-230	N/A			3.3E-13	0.00%	0.00%	3.3E-13	0.00%	0.00%	5.2E-14	0.00%	0.00%	5.2E-14	0.00%	0.00%	3.3E-12	0.00%	0.00%
	TH-232	N/A			3.3E-12	0.01%	0.00%	3.3E-12	0.01%	0.00%	5.2E-13	0.00%	0.00%	5.2E-13	0.00%	0.00%	3.3E-11	0.01%	0.00%
	U-234	N/A			8.9E-12	0.02%	0.00%	8.9E-12	0.02%	0.00%	1.6E-12	0.01%	0.00%	1.6E-12	0.01%	0.00%	8.9E-11	0.02%	0.00%
	U-235/236	N/A			4.0E-13	0.00%	0.00%	4.0E-13	0.00%	0.00%	7.2E-14	0.00%	0.00%	7.2E-14	0.00%	0.00%	4.0E-12	0.00%	0.00%
	U-238				1.6E-11	0.03%	0.00%	1.6E-11	0.03%	0.00%	2.8E-12	0.02%	0.00%	2.8E-12	0.02%	0.00%	1.6E-10	0.03%	0.00%
	Total Radiological Risk				1.1E-09	2.45%	0.01%	1.1E-09	2.45%	0.01%	1.9E-10	1.64%	0.03%	1.9E-10	1.64%	0.03%	1.2E-08	2.45%	0.01%
	Arsenic	N/A			4.2E-08	88.56%	0.38%	4.2E-08	88.56%	0.38%	9.8E-09	83.14%	1.35%	9.8E-09	83.14%	1.35%	4.2E-07	88.55%	0.50%
	Beryllium	N/A			1.5E-09	3.27%	0.01%	1.5E-09	3.27%	0.01%	2.4E-10	2.05%	0.03%	2.4E-10	2.05%	0.03%	1.5E-08	3.26%	0.02%
	Benzo(a)anthracene	N/A			7.8E-11	0.17%	0.00%	7.8E-11	0.17%	0.00%	4.5E-11	0.38%	0.01%	4.5E-11	0.38%	0.01%	7.9E-10	0.17%	0.00%
	Benzo(a)pyrene	N/A			2.3E-09	4.82%	0.02%	2.3E-09	4.82%	0.02%	1.3E-09	11.07%	0.18%	1.3E-09	11.07%	0.18%	2.3E-08	4.83%	0.03%
	Benzo(b)fluoranthene	N/A			3.5E-10	0.74%	0.00%	3.5E-10	0.74%	0.00%	2.0E-10	1.71%	0.03%	2.0E-10	1.71%	0.03%	3.5E-09	0.74%	0.00%
	Total Chemical Risk				4.6E-08	97.55%	0.42%	4.6E-08	97.55%	0.42%	1.2E-08	98.36%	1.60%	1.2E-08	98.36%	1.60%	4.6E-07	97.55%	0.55%
	Total				4.7E-08	100.00%	0.43%	4.7E-08	100.00%	0.43%	1.2E-08	100.00%	1.63%	1.2E-08	100.00%	1.63%	4.7E-07	100.00%	0.56%
Beef/Milk (Groundwater Affected)	NP-237	N/A			2.5E-10	0.03%	0.00%	2.5E-10	0.03%	0.00%	1.9E-11	0.01%	0.00%	1.9E-11	0.01%	0.00%	3.1E-12	0.00%	0.00%
	RA-226	N/A			6.2E-08	6.76%	0.57%	6.2E-08	6.76%	0.57%	1.1E-08	6.38%	1.50%	1.1E-08	6.38%	1.50%	6.5E-07	9.06%	0.78%
	SR-90	N/A			7.9E-07	85.69%	7.28%	7.9E-07	85.69%	7.28%	1.5E-07	86.22%	20.33%	1.5E-07	86.22%	20.33%	6.0E-06	83.65%	7.22%
	U-234	N/A			3.2E-09	0.35%	0.03%	3.2E-09	0.35%	0.03%	5.8E-10	0.34%	0.08%	5.8E-10	0.34%	0.08%	2.4E-08	0.33%	0.03%
	U-235/236	N/A			6.6E-08	7.15%	0.61%	6.6E-08	7.15%	0.61%	1.2E-08	7.02%	1.66%	1.2E-08	7.02%	1.66%	5.0E-07	6.95%	0.60%
	U-238	N/A			0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Radiological Risk				9.2E-07	99.97%	8.50%	9.2E-07	99.97%	8.50%	1.7E-07	99.96%	23.57%	1.7E-07	99.96%	23.57%	7.2E-06	100.00%	8.63%
	Arsenic	N/A			2.5E-10	0.03%	0.00%	2.5E-10	0.03%	0.00%	6.0E-11	0.04%	0.01%	6.0E-11	0.04%	0.01%	6.3E-16	0.00%	0.00%
	Beryllium	N/A			2.9E-12	0.00%	0.00%	2.9E-12	0.00%	0.00%	4.5E-13	0.00%	0.00%	4.5E-13	0.00%	0.00%	3.7E-18	0.00%	0.00%
	Total Chemical Risk				2.6E-10	0.03%	0.00%	2.6E-10	0.03%	0.00%	6.0E-11	0.04%	0.01%	6.0E-11	0.04%	0.01%	6.3E-16	0.00%	0.00%
	Total				9.2E-07	100.00%	8.50%	9.2E-07	100.00%	8.50%	1.7E-07	100.00%	23.58%	1.7E-07	100.00%	23.58%	7.2E-06	100.00%	8.63%
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Ambient Radon		4.5E-08			1.2E-07			1.2E-07			2.2E-09			2.2E-09			1.5E-06		
ALL MEDIA		**4.9E-05**			**1.1E-05**			**1.1E-05**			**7.2E-07**			**7.2E-07**			**8.4E-05**		

TABLE B.3.1-30
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			3.0E-09	100.00%	84.43%
	Total													3.0E-09	100.00%	84.43%
Beef/Milk (Dust Affected)	CS-137	9.7E-11	0.37%	0.00%	2.4E-10	0.21%	0.00%	N/A			N/A			N/A		
	NP-237	3.3E-12	0.01%	0.00%	4.7E-12	0.00%	0.00%	N/A			N/A			N/A		
	PU-238	5.0E-15	0.00%	0.00%	1.0E-14	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	2.7E-15	0.00%	0.00%	5.4E-15	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	3.4E-10	1.29%	0.01%	1.3E-09	1.07%	0.02%	N/A			N/A			N/A		
	RA-228	1.9E-11	0.07%	0.00%	7.2E-11	0.06%	0.00%	N/A			N/A			N/A		
	SR-90	7.2E-11	0.28%	0.00%	3.0E-10	0.25%	0.01%	N/A			N/A			N/A		
	TH-228	1.5E-13	0.00%	0.00%	4.9E-13	0.00%	0.00%	N/A			N/A			N/A		
	TH-230	1.6E-13	0.00%	0.00%	5.2E-13	0.00%	0.00%	N/A			N/A			N/A		
	TH-232	1.6E-12	0.01%	0.00%	5.2E-12	0.00%	0.00%	N/A			N/A			N/A		
	U-234	4.1E-12	0.02%	0.00%	1.6E-11	0.01%	0.00%	N/A			N/A			N/A		
	U-235/236	1.8E-13	0.00%	0.00%	7.2E-13	0.00%	0.00%	N/A			N/A			N/A		
	U-238	7.2E-12	0.03%	0.00%	2.8E-11	0.02%	0.00%									
	Total Radiological Risk	5.4E-10	2.08%	0.01%	1.9E-09	1.64%	0.03%									
	Arsenic	2.3E-08	89.34%	0.48%	9.8E-08	83.13%	1.71%	N/A			N/A			N/A		
	Beryllium	8.8E-10	3.37%	0.02%	2.4E-09	2.05%	0.04%	N/A			N/A			N/A		
	Benzo(a)anthracene	4.0E-11	0.15%	0.00%	4.5E-10	0.38%	0.01%	N/A			N/A			N/A		
	Benzo(a)pyrene	1.1E-09	4.39%	0.02%	1.3E-08	11.09%	0.23%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	1.8E-10	0.67%	0.00%	2.0E-09	1.70%	0.04%	N/A			N/A			N/A		
	Total Chemical Risk	2.6E-08	97.92%	0.53%	1.2E-07	98.36%	2.03%									
	Total	2.6E-08	100.00%	0.54%	1.2E-07	100.00%	2.06%									
Beef/Milk (Groundwater Affected)	NP-237	1.7E-13	0.00%	0.00%	2.4E-13	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	3.0E-08	9.21%	0.63%	1.1E-07	8.56%	2.00%	N/A			N/A			N/A		
	SR-90	2.8E-07	83.46%	5.71%	1.1E-06	84.27%	19.69%	N/A			N/A			N/A		
	U-234	1.1E-09	0.34%	0.02%	4.4E-09	0.33%	0.08%	N/A			N/A			N/A		
	U-235/236	2.3E-08	6.99%	0.48%	9.1E-08	6.84%	1.60%	N/A			N/A			N/A		
	U-238	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	3.3E-07	100.00%	6.84%	1.3E-06	100.00%	23.37%									
	Arsenic	3.5E-17	0.00%	0.00%	1.5E-16	0.00%	0.00%	N/A			N/A			N/A		
	Beryllium	2.1E-19	0.00%	0.00%	5.9E-19	0.00%	0.00%	N/A			N/A			N/A		
	Total Chemical Risk	3.5E-17	0.00%	0.00%	1.5E-16	0.00%	0.00%									
	Total	3.3E-07	100.00%	6.84%	1.3E-06	100.00%	23.37%									
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			5.5E-10	100.00%	15.57%
	Total													5.5E-10	100.00%	15.57%
Ambient Radon		1.1E-07			2.6E-08			N/A			N/A			N/A		
ALL MEDIA		**4.8E-06**			**5.7E-06**			**1.4E-09**			**7.7E-09**			**3.5E-09**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

TABLE B.3.1-31
ACTIVE FLYASH PILE
FUTURE LAND USE
SUMMARY OF TOTAL NON-CARCINOGENIC HAZARD

Medium	Parameter	Expanded Trespasser	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Res. Child (Priv. Own.)	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Res. Child (Fed. Own.)	% Total Medium Hazard	% Total Receptor Hazard	On-Property Resident Farmer (RME)	% Total Medium Hazard	% Total Receptor Hazard
Soil	Arsenic	1.6E-02	43.68%	38.54%	ND			ND			ND			ND			ND		
	Beryllium	1.4E-02	37.26%	32.87%	ND			ND			ND			ND			ND		
	Thallium	7.0E-03	19.06%	16.82%	ND			ND			ND			ND			ND		
	Total	3.7E-02	100.00%	88.23%															
Groundwater	Arsenic	N/A			6.8E-06	0.01%	0.00%	6.8E-06	0.01%	0.00%	1.6E-05	0.01%	0.00%	1.6E-05	0.01%	0.00%	1.7E-11	0.00%	0.00%
	Beryllium	N/A			9.9E-09	0.00%	0.00%	9.9E-09	0.00%	0.00%	2.1E-08	0.00%	0.00%	2.1E-08	0.00%	0.00%	1.3E-14	0.00%	0.00%
	U-Total	N/A			9.9E-02	99.99%	50.73%	9.9E-02	99.99%	50.73%	2.3E-01	99.99%	28.47%	2.3E-01	99.99%	28.47%	7.5E-01	100.00%	75.70%
	Total				9.9E-02	100.000%	50.73%	9.9E-02	100.000%	50.73%	2.3E-01	100.000%	28.48%	2.3E-01	100.000%	28.48%	7.5E-01	100.00%	75.70%
Surface Water	Arsenic	4.7E-03	96.72%	11.39%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	1.6E-04	3.28%	0.39%	N/A			N/A			N/A			N/A			N/A		
	Total	4.9E-03	100.00%	11.77%															
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Total	N/A																	
Sediment	Arsenic	1.2E-02	42.17%	27.90%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	1.6E-02	57.83%	38.27%	N/A			N/A			N/A			N/A			N/A		
	Total	2.7E-02	100.00%	66.17%															
Homegrown Produce (Dust Affected)	Arsenic	N/A			2.3E-04	89.64%	0.12%	2.3E-04	89.64%	0.12%	8.7E-04	89.64%	0.11%	8.7E-04	89.64%	0.11%	2.3E-03	89.62%	0.23%
	Beryllium	N/A			6.2E-07	0.25%	0.00%	6.2E-07	0.25%	0.00%	2.4E-06	0.25%	0.00%	2.4E-06	0.25%	0.00%	6.2E-06	0.25%	0.00%
	Thallium	N/A			2.6E-05	10.11%	0.01%	2.6E-05	10.11%	0.01%	9.9E-05	10.11%	0.01%	9.9E-05	10.11%	0.01%	2.6E-04	10.13%	0.03%
	Total				2.5E-04	100.00%	0.13%	2.5E-04	100.00%	0.13%	9.7E-04	100.00%	0.12%	9.7E-04	100.00%	0.12%	2.5E-03	100.00%	0.26%
Homegrown Produce (Groundwater Affected)	Arsenic	N/A			1.7E-06	0.00%	0.00%	1.7E-06	0.00%	0.00%	4.0E-06	0.00%	0.00%	4.0E-06	0.00%	0.00%	6.5E-12	0.00%	0.00%
	Beryllium	N/A			1.6E-09	0.00%	0.00%	1.6E-09	0.00%	0.00%	3.8E-09	0.00%	0.00%	3.8E-09	0.00%	0.00%	3.3E-15	0.00%	0.00%
	U-Total	N/A			9.2E-02	100.00%	47.54%	9.2E-02	100.00%	47.54%	5.4E-01	100.00%	67.84%	5.4E-01	100.00%	67.84%	2.1E-01	100.00%	21.57%
	Total				9.2E-02	100.00%	47.54%	9.2E-02	100.00%	47.54%	5.4E-01	100.00%	67.84%	5.4E-01	100.00%	67.84%	2.1E-01	100.00%	21.57%
Homegrown Produce (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Beef/Milk (Dust Affected)	Arsenic	N/A			7.9E-05	21.67%	0.04%	7.9E-05	21.67%	0.04%	2.2E-04	18.86%	0.03%	2.2E-04	18.86%	0.03%	7.9E-04	21.63%	0.08%
	Beryllium	N/A			7.1E-08	0.02%	0.00%	7.1E-08	0.02%	0.00%	1.3E-07	0.01%	0.00%	1.3E-07	0.01%	0.00%	7.1E-07	0.02%	0.00%
	Thallium	N/A			2.9E-04	78.31%	0.15%	2.9E-04	78.31%	0.15%	9.3E-04	81.13%	0.12%	9.3E-04	81.13%	0.12%	2.9E-03	78.35%	0.29%
	Total				3.6E-04	100.00%	0.19%	3.6E-04	100.00%	0.19%	1.2E-03	100.00%	0.14%	1.2E-03	100.00%	0.14%	3.7E-03	100.00%	0.37%
Beef/Milk (Groundwater Affected)	Arsenic	N/A			4.8E-07	0.02%	0.00%	4.8E-07	0.02%	0.00%	1.3E-06	0.00%	0.00%	1.3E-06	0.00%	0.00%	1.2E-12	0.00%	0.00%
	Beryllium	N/A			1.3E-10	0.00%	0.00%	1.3E-10	0.00%	0.00%	2.5E-10	0.00%	0.00%	2.5E-10	0.00%	0.00%	1.7E-16	0.00%	0.00%
	U-Total	N/A			2.7E-03	99.98%	1.41%	2.7E-03	99.98%	1.41%	2.7E-02	100.00%	3.42%	2.7E-02	100.00%	3.42%	2.1E-02	100.00%	2.10%
	Total				2.7E-03	100.00%	1.41%	2.7E-03	100.00%	1.41%	2.7E-02	100.00%	3.42%	2.7E-02	100.00%	3.42%	2.1E-02	100.00%	2.10%
Beef/Milk (GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
ALL MEDIA		**4.2E-02**			**1.9E-01**			**1.9E-01**			**7.9E-01**			**7.9E-01**			**9.9E-01**		

TABLE B.3.1-31
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Hazard	% Total Receptor Hazard	On-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Resid. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Soil	Arsenic	ND			ND			N/A			N/A			N/A		
	Beryllium	ND			ND			N/A			N/A			N/A		
	Thallium	ND			ND			N/A			N/A			N/A		
	Total															
Groundwater	Arsenic	7.9E-12	0.00%	0.00%	3.9E-11	0.00%	0.00%	N/A			N/A			N/A		
	Beryllium	5.8E-15	0.00%	0.00%	2.8E-14	0.00%	0.00%	N/A			N/A			N/A		
	U-Total	3.5E-01	100.00%	77.42%	1.7E+00	100.00%	62.14%	N/A			N/A			N/A		
	Total	3.5E-01	100.00%	77.42%	1.7E+00	100.00%	62.14%									
Surface	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Total															
GMR Surface	Arsenic	N/A			N/A			6.1E-06	100.00%	100.00%	1.5E-05	100.00%	100.00%	N/A		
Water	*Total*							6.1E-06	100.00%	100.00%	1.5E-05	100.00%	100.00%			
Sediment	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Total															
Homegrown	Arsenic	9.8E-04	89.62%	0.22%	8.8E-03	89.62%	0.32%	N/A			N/A			N/A		
Produce	Beryllium	2.7E-06	0.25%	0.00%	2.4E-05	0.25%	0.00%	N/A			N/A			N/A		
(Dust	Thallium	1.1E-04	10.13%	0.02%	9.9E-04	10.13%	0.04%	N/A			N/A			N/A		
Affected)	*Total*	1.1E-03	100.00%	0.24%	9.8E-03	100.00%	0.35%									
Homegrown	Arsenic	2.8E-12	0.00%	0.00%	2.5E-11	0.00%	0.00%	N/A			N/A			N/A		
Produce	Beryllium	1.4E-15	0.00%	0.00%	1.3E-14	0.00%	0.00%	N/A			N/A			N/A		
(Groundwater	U-Total	9.1E-02	100.00%	20.33%	8.2E-01	100.00%	29.63%	N/A			N/A			N/A		
Affected)	*Total*	9.1E-02	100.00%	20.33%	8.2E-01	100.00%	29.63%									
Homegrown	Arsenic	N/A			N/A			N/A			N/A			5.7E-06	100.00%	84.43%
Produce (GMR Surf. Water Affected)	*Total*													5.7E-06	100.00%	84.43%
Beef/Milk	Arsenic	3.5E-04	21.86%	0.08%	2.2E-03	18.83%	0.08%	N/A			N/A			N/A		
(Dust	Beryllium	3.2E-07	0.02%	0.00%	1.3E-06	0.01%	0.00%	N/A			N/A			N/A		
Affected)	Thallium	1.2E-03	78.12%	0.27%	9.4E-03	81.16%	0.34%	N/A			N/A			N/A		
	Total	1.6E-03	100.00%	0.35%	1.2E-02	100.00%	0.42%									
Beef/Milk	Arsenic	5.2E-13	0.00%	0.00%	3.3E-12	0.00%	0.00%	N/A			N/A			N/A		
(Groundwater	Beryllium	7.7E-17	0.00%	0.00%	3.2E-16	0.00%	0.00%	N/A			N/A			N/A		
Affected)	U-Total	7.4E-03	100.00%	1.66%	2.1E-01	100.00%	7.46%	N/A			N/A			N/A		
	Total	7.4E-03	100.00%	1.66%	2.1E-01	100.00%	7.46%									
Beef/Milk	Arsenic	N/A			N/A			N/A			N/A			1.0E-06	100.00%	15.57%
(GMR Surf. Water Affected)	*Total*													1.0E-06	100.00%	15.57%
ALL MEDIA		**4.5E-01**			**2.8E+00**			**6.1E-06**			**1.5E-05**			**6.7E-06**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D signifies the hazard was not calculated because toxicity data are not available.

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containing radium-226, strontium-90, and uranium -235/236 which accounted for an additional 28 and 29 percent, respectively, of the total receptor risk. Total HI for the RME farmer was below 1.0, but for the child HI was 2.8 due mostly to uranium - total in groundwater and ingestion of produce ingested irrigated with groundwater containing uranium-total.

The only receptor associated with a HI greater than 1.0 is the future on-property child. Total HI for the future on-property child is 2.8 due mostly to the presence of total uranium in groundwater which accounted for approximately 100 percent of total receptor hazard.

Total estimated risk to the on-property CT farmer was 4.8×10^{-6} due mostly to the presence of uranium-234 and uranium-238 in groundwater which accounts for 56.6 percent of the total risk to this receptor. Total HI for this receptor did not exceed 1.0.

Total estimated risk to future Great Miami River users were on the order of 10^{-9} risk for all three users. Total HIs were well below 1.0.

B.3.2 SOUTH FIELD

B.3.2.1 Exposure Point Concentrations

Table B.3.2-1 summarizes the exposure scenarios evaluated to assess risks associated with the South Field. It also summarizes derivation of exposure concentrations specific to this subunit. With the Exposure point concentrations for surface soil were derived from the analytical data on samples collected within the boundaries of the South Field subunit. All other exposure point concentrations were derived using modeled results.

For groundwater exposure, data from the Inactive Flyash Pile and the South Field were combined to develop source terms for estimating future groundwater concentrations as described in Section 5.0 of this RI report. This is because the groundwater underlying and migrating from these subunits is closely interconnected. To assess risk due to groundwater exposures for each of these units, single maximum groundwater concentrations of each groundwater CPC were estimated for both the future off-property farmer and the future on-property farmer. It was assumed that the on-property farmer resided directly on the South Field and simultaneously farmed that area. Because it was assumed a home could be constructed on directly the South Field, both risks to a homebuilder and risks due to

TABLE B.3.2-1

SOUTH FIELD
EXPOSURE POINT CONCENTRATIONS FOR SCENARIOS EVALUATED

Current Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current with Access Controls and without (current use of FEMP continues, DOE ownership)	Trespassing Youth	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
		air	inhalation of particulates, volatiles, and gases	maximum estimated on-subunit current concentrations derived from airborne soil air modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	incidental ingestion dermal contact external radiation	sediment within subunit
	Off-Property Resident Farmer (adult and child), homegrown produce off-property, livestock grazing off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property current concentrations derived from airborne soil air modeling concentrations
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property current concentrations derived from deposited airborne soil air modeling results
		livestock (grazing off-property)	ingestion of milk and beef	maximum estimated off-property current concentrations derived from deposited airborne soil air modeling results
	Groundskeeper	air	inhalation of particulates, volatiles, and gases	maximum estimated on-subunit current concentration derived from air modeling
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit

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TABLE B.3.2-1
(Continued)

Current Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current with Access Controls (current use of FEMP continues, DOE ownership) (continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruit and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Household User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Current without Access Controls (current use of FEMP continues)	User of Meat and Milk Products		livestock (grazing on-property)	ingestion of milk and beef	maximum estimated on-property current concentrations derived from deposited South Field surface soil air modeling results

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TABLE B.3.2-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne soil air modeling results
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		groundwater	ingestion dermal contact inhalation of volatiles released during household use	modeled groundwater concentrations off-site at time when concentration is greatest (South Field and Inactive Flyash Pile combined)
	Expanded Trespasser (youth)	air	inhalation of particulates, volatiles, and gases	maximum estimated on-subunit airborne soil modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	incidental ingestion dermal contact external radiation	sediment within subunit
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit

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TABLE B.3.2-1
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership (Continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami Aquifer
			fish	ingestion	estimated concentrations in the Great Miami Aquifer
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruits and vegetables	estimated concentrations in the Great Miami Aquifer
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami Aquifer
		Household User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami Aquifer
Without Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property.		air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne soil air modeling results
			plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
			livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
			groundwater	ingestion dermal contact inhalation of volatiles released during household use	modeled groundwater concentrations off-site at time when concentration is greatest (South Field and Inactive Flyash Pile combined)

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TABLE B.3.2-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future On-Property Resident Farmer (adult and child), homegrown produce on-subunit,livestock grazing (on-subunit, groundwater on-property, RME and CT estimates	air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-subunit future concentrations from airborne soil modeling results; and modeled radon emissions from soil radium
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-subunit future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-subunit future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations underlying South Field at time when concentration is greatest (South Field and Inactive Flyash Pile combined)
	Future On-Property Resident Farmer (adult and child), homegrown produce on-subunit, livestock grazing on-subunit, groundwater on-property, RME and CT estimates	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
	Future Homebuilder	waste material/subsurface soil	external radiation incidental ingestion dermal contact	waste material/subsurface soil within subunit
		air	inhalation of particulates, volatiles, and gases	estimated air concentrations at construction site on subunit

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TABLE B.3.2-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future Perched Groundwater User, homegrown produce on-subunit, livestock grazing on-subunit, groundwater on-property Solid Waste Landfill and Lime Sludge Ponds only)	air	inhalation of particulates, volatiles, gases, and indoor radon	not quantified; no perched groundwater user was evaluated for the South Field because no useable perched water from the South Field is available.
		plants (homegrown produce)	ingestion of fruits and vegetables	not quantified; no perched groundwater user was evaluated for the South Field because no useable perched water from the South Field is available.
		livestock (grazing on property)	ingestion of milk and beef	not quantified; no perched groundwater user was evaluated for the South Field because no useable perched water from the South Field is available.
		perched groundwater directly underlying subunit	ingestion dermal contact inhalation of volatiles released during household use	not quantified; no useable perched groundwater at South Field
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit

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indoor radon were estimated for this area. This and other relevant information regarding exposure point concentrations for the South Field are summarized in Table B.3.2-1.

B.3.2.2 Constituents of Potential Concern

The CPCs quantified for South Field surface soil, subsurface soil, and seeps are summarized in Tables B.3.2.2(a), (b), and (c), respectively (Attachment III). CPCs quantified for South Field perched water are summarized in Table B.3.1-2(c) in Attachment B.III. Table B.3.2-3 summarizes CPCs for the South Field by medium.

B.3.2.3 Risk Characterization for Current Land Use

The scenarios characterized for the South Field assuming continued DOE ownership with access controls are a trespassing youth; the off-property resident farmer and resident child using food products from livestock grazing off-property and from produce grown off-property; an on-property groundskeeper exposed to on-site contaminant concentrations; and a Great Miami River recreational user, a Great Miami River agricultural user, and a Great Miami River residential user. In the event that the FEMP lost access controls, a user of meat and milk products from livestock grazed on-property was also evaluated.

B.3.2.3.1 Trespassing Youth

Risk was characterized for a trespassing youth on the South Field exposed to CPCs via ingestion and dermal contact with surface soil, sediment, and surface water located on the subunit; external radiation from exposure to on-subunit surface soil; and inhalation of on-subunit airborne soil particulates. Exposure point concentrations for exposure to surface soil, were based on analytical data from South Field soil samples. The exposure point concentrations for surface water and sediment were inhaled particulate concentration were based on modeling results as described in Section B.2.0 of this appendix and Section 5.0 and Appendix A of this RI report.

Risks and hazards calculated for the trespassing youth exposed to CPCs in surface soil on the South Field are presented in Table B.3.2-4 (Attachment B.III). The total risk due surface to soil for this receptor was 5.9×10^{-5}. This was primarily due to external radiation exposure to radium-226 (4.0×10^{-5}), radium-228 (2.4×10^{-6}), thorium-228 (5.3×10^{-6}) thorium-232 (7.3×10^{-6}) and dermal contact with benzo(a)pyrene (1.5×10^{-6}). Total HI did not exceed 1.0.

TABLE B.3.2-3

SOUTH FIELD
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Groundwater (GMA)
arsenic	arsenic	arsenic	arsenic	arsenic
beryllium	beryllium	lead	beryllium	lead
lead	lead	uranium-234	lead	neptunium-237
cesium-137	cesium-137	uranium-235/236	nickel	radium-226
neptunium-237	neptunium-237	uranium-238	neptunium-237	strontium-90
plutonium-238	lead-210	uranium-total	plutonium-238	technetium-99
plutonium-239/240	plutonium-238	neptanium-237	radium-226	uranium-234
radium-226	plutonium-239/240	radium-226	radium-228	uranium-235/236
radium-228	radium-224	technetium-99	strantium-90	uranium-238
strontium-90	radium-226	2-methylnaphthalene	technetium-99	uranium-total
technetium-99	radium-228	benzo(a)pyrene	uranium-234	2-methylnaphthalene
thorium-228	ruthenium-106	phenanthrene	uranium-235/236	benzo(g,h,i)perylene
thorium-230	thorium-228	tributyl phosphate	uranium-238	phenanthrene
thorium-232	thorium-230		uranium-total	tributyl phosphate
thorium-total	thorium-232		benzo(a)anthracene	
uranium-234	thorium-total		benzo(a)pyrene	
uranium-235/236	uranium-234		benzo(b)fluoranthene	
uranium-238	uranium-235		benzo(g,h,i)perylene	
Aroclor-1254	uranium-235/236		bis(2-ethylhexyl)phthalate	
Aroclor-1260	uranium-238		dibenzo(a,h)anthracene	
dieldrin	uranium-total		dieldrin	
benzo(a)anthracene	2-methylnaphthalene		phenanthrene	
benzo(a)pyrene	benzo(a)anthracene			
benzo(b)fluoranthene	benzo(a)pyrene			
benzo(g,h,i)perylene	benzo(b)fluoranthene			
benzo(k)fluoranthene	benzo(g,h,i)perylene			
dibenzo(a,h)anthracene	phenanthrene			
indeno(1,2,3-cd)pyrene	tributyl phosphate			
phenanthrene	octachlo-odibenzo-p-dioxin			
	tetrachlorodibenzofuran			
	Aroclor-1254			
	Aroclor-1260			
	dieldrin			

Risks and hazards calculated for the trespassing youth exposed to CPCs in surface water on the South Field are presented in Table B.3.2-5 (Attachment B.III). Total risk from surface water posed a 2.8 x 10^{-5} due primarily to the presence of the HI was 53 due to dermal contact with uranium-total in surface water.

Risks and hazards calculated for the trespassing youth exposed to CPCs in sediment on the South Field are presented in Table B.3.2-6 (Attachment B.III). The total risk was 1.5 x 10^{-5}. This was primarily due to external radiation exposure to radium-226 (1.3 x 10^{-5}). HI did not exceed 1.0.

B.3.2.3.2 Current Off-Property Farmers

Risk was characterized for the off-property farmer and resident child contacting CPCs via inhalation of airborne South Field soil particulates, ingestion of airborne particulates deposited on homegrown produce, and ingestion of milk or beef from livestock grazing on particulates deposited on off-site vegetation. For all of these routes of exposure, the exposure point concentration was based on air modeling results as described in the methods section.

Risks and hazards calculated for the off-property farmer and resident child exposed to CPCs in airborne soil migrating off of the subunit are presented in Tables B.3.2-7(a) and B.3.2-7(b), respectively (Attachment B.III). Total risk did not exceed the 1.0 x 10^{-6} risk level and HIs did not exceed 1.0 for either the farmer or child.

Risks and hazards associated with the ingestion of CPCs in beef and milk for the off-property resident farmer and child are given in Table B.3.2-8(a) and B.3.2-8(b), respectively (Attachment B.III). The total risk for all CPCs consumed in beef and milk was 3.7 x 10^{-7} and 2.1 x 10^{-7} for the farmer and child, respectively. The total HIs did not exceed 1.0 for either receptor.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property farmer and resident child are given in Tables B.3.2-9(a) and B.3.2-9(b), respectively (Attachment B.III). The total risk for all CPCs consumed in homegrown produce was 8.5 x 10^{-8} and 2.5 x 10^{-8} for the farmer and child, respectively. Total HIs were well below 1.0 for both receptors.

B.3.2.3.3 Current User of Milk/Meat Products

Risks and hazards were characterized for a current user of milk and meat products from livestock potentially grazing within the South Field boundaries. Exposure point concentrations in beef and milk were derived from the maximum estimated on-property current deposition rates of airborne South Field surface soil.

Risk and hazard to the current user of meat and milk products are given in Table B.3.2-10 (Attachment B.III). Total risk to this receptor was 4.5×10^{-6} due mostly to the ingestion of beef and milk affected by dust containing benzo(a)pyrene (1.5×10^{-6}) and dibenzo(a,h)anthracene (1.7×10^{-6}). Total HI was well below 1.0.

B.3.2.3.4 Current Groundskeeper

Risks and hazards associated with the current groundskeeper are given in Table B.3.2-11 (Attachment B.III). Total carcinogenic risk from surface soil was 2.2×10^{-4} due mostly to the presence of radium-226 (1.5×10^{-4}), of radium-228 (9.0×10^{-6}), thorium-228 (2.2×10^{-5}), and thorium-232 (2.7×10^{-5}), and soil ingestion and dermal contact to benzo(a)pyrene(6.7×10^{-6}). Total HI was below 1.0.

B.3.2.4 Risk Characterization for Future Land Use

The scenarios characterized for the South Field assuming future federal ownership are the off-property farmer and resident child and an expanded trespasser. Scenarios characterized for the South Field assuming future private ownership are a farmer and resident child living on the South Field and a future homebuilder. Risks for a future perched groundwater user are not evaluated because there is no usable perched groundwater at the South Field. Recreational users of the Great Miami River were also evaluated.

B.3.2.4.1 Future Off-Property Farmers

For the off-property farmer and resident child (private and federal ownership), risks were calculated for exposure to CPCs in airborne South Field soil and in groundwater underlying the South Field and Inactive Flyash Pile. Receptors are assumed to contact CPCs in air via inhalation of particulates; consumption of homegrown produce irrigated with contaminated groundwater and on which contaminated airborne soil was deposited; ingestion of milk and beef from cattle grazing off-site consuming vegetation on which airborne soil was deposited and drinking contaminated groundwater; and by ingestion, dermal contact, and inhalation of contaminated groundwater. All of the exposure

point concentrations for this scenario were derived from air and groundwater modeling results as described in Section B.2.0, Methodology.

Risks and hazards calculated for the future off-property farmer (private and federal ownership) exposed to CPCs in airborne soil are presented in Tables B.3.2-12(a) and B.3.2-12(c), respectively (Attachment B.III). Total risk from surface soil for the farmer was 6.8×10^{-6}. This was primarily due to inhalation of radioactive CPCs; in particular, thorium-228 (1.0×10^{-6}), thorium-230 (1.2×10^{-6}), thorium-232 (1.3×10^{-6}), and uranium-238 (1.5×10^{-6}). The individual risks associated with all other CPCs did not exceed the 10^{-6} risk level. Total HI did not exceed 1.0 for either the farmer or child.

Risks and hazards for the future off-property child (private and federal ownership) exposed to CPCs in airborne soil are presented in Tables B.3.2.12(b) and B.3.2.12(d), respectively (Attachment III). For the child under both private and federal ownership risk did not exceed 1.0×10^{-6}. Total HI did not exceed 1.0 for either child.

Risks and hazards associated with ingestion of CPCs in beef and milk for the future off-property farmer and resident child (private and federal ownership) scenario are given in Tables B.3.2-13(a) and B.3.2-13(b), respectively (Attachment B.III). Total farmer, private and federal ownership, risk for all CPCs consumed in beef and milk was 1.9×10^{-5} under private ownership was and 2.0×10^{-6} Aroclor-1260(1.8×10^{-6}) respectively. Risk to the farmer due mostly to the estimated presence of benzo(a)pyrene (6.1×10^{-6}), and dibenzo(a,h)anthracene(6.8×10^{-6}) ,in beef and milk. Risk to the federal ownership of the off-property farmer was due to the cumulative presence of CPCs in dust affected beef and milk products. Risks to the off-property child under private and federal ownership were 1.0 x 10-5, respectively. Major contributions to risk from this pathway were aroclor-1260, benzo(a)pyrene and dibenzo(a,h)anthracene. HI for the farmers did not exceed 1.0, but for the child (both private and federal), was 1.1 due to homegrown produce irrigated with groundwater contaminated with uranium-total.

Risks and hazards associated with ingestion of CPCs in homegrown produce under private and federal ownership for the future off-property farmer and resident child are given in Tables B.3.2-14(a), B.3.2-14(b), B.3.2-14(c), and B.3.2-14(d), respectively (Attachment B.III). Total risk for all CPCs consumed in homegrown produce were 2.0×10^{-5} 1.7×10^{-5} and 1.2×10^{-6} for the farmer and child

under private ownership, respectively. Total risk to the farmers under federal ownership were 1.7 x 10^{-5} and 1.2 x 10^{-6} respectively, for the farmer and child. Risks to off-property farmers were due primarily to homegrown produce irrigated with contaminated groundwater containing uranium-234 and uranium-238, and affected by dust containing benzo(a)pyrene. Total HI for all CPCs consumed in homegrown produce was well below 1.0 for the farmer but for the child exceeded 1.0 due to the homegrown produce irrigated with groundwater contaminated with uranium-total.

The risks and hazards associated with exposures of the off-property farmer and resident child under (private and federal ownership) to contaminated groundwater are given in Tables B.3.2-15(a), B.3.2.-15(b), B.3.2-15(c), and B.3.2-15(d), respectively (Attachment B.III). Total risk via all routes of direct exposure to groundwater (ingestion, inhalation, and dermal contact) for the farmer is and for the resident child is 2.4 x 10^{-6}. Most of this risk is attributable to ingestion of the radionuclides uranium-234 and uranium-238. Total HI via all routes of direct exposure to groundwater for the farmer is less than 1.0. The child, however, is associated with a HI of 2 due to the ingestion of uranium-total.

B.3.2.4.2 Future On-Property Expanded Trespasser

Risks to the future South Field expanded trespasser were calculated for exposure to CPCs detected on the subunit. The expanded trespasser was anticipated to contact CPCs directly via inhalation of airborne particulates surface of soil, ingestion, and dermal contact with on-subunit surface soil, sediment, and surface water, and external radiation resulting from exposure to on-subunit surface soil and sediment. Exposure point concentrations for inhalation of airborne particles , surface water, and sediment were estimated from modeling results. Exposure point concentrations were derived from analytical data from samples taken at the South Field.

Risks and hazards for a future expanded trespasser of the South Field exposed to CPCs in on-subunit surface soil and airborne particulates are given in Table B.3.2-16 (Attachment B.III). Total risk was 1.2 x 10^{-4}. This was primarily due to the external radiation effects of radium-226 (8.3 x 10^{-5}), radium-228 (5.0 x 10^{-6}) thorium-232 (1.1 x 10^{-5}), thorium-228 (1.5 x 10^{-5}), ingestion of benzo(a)pyrene in soil (3.3 x 10^{-6}). Risks calculated for all other CPCs did not exceed the 10^{-6} risk level. Total HI did not exceed 1.0.

Risks and hazards calculated for the future expanded trespasser exposed to CPCs in sediment located on the South Field subunit are presented in Table B.3.2-17 (Attachment B.III). Total risk due to exposure to all CPCs in sediment by all exposure pathways is 1×10^{-5}. This was primarily due to external radiation of radium-226(1.3×10^{-5}) in sediment. Risks and hazards for a future expanded trespasser exposed to surface water are given in Table B.3.2-18 (Attachment B.III). The risk due to exposure to CPCs in surface water was 8.3×10^{-7}. Total HIs calculated for exposure of an expanded trespasser to CPCs found in the surface soil, sediment, or surface water on the South Field subunit did not exceed 1.0.

B.3.2.4.3 Future On-Property Farmers

RME risk estimates were calculated for the future on-property farmer and resident child with livestock grazing on-property and using groundwater underlying the South Field and Inactive Flyash Pile impacted by these subunits. Receptors are presumed to contact CPCs via inhalation of airborne soil particulates, ingestion, and dermal contact with South Field surface soil; external radiation from South Field surface soil; consumption of homegrown produce irrigated with contaminated groundwater and on which contaminated airborne soil was deposited; ingestion of milk and beef from cattle drinking contaminated groundwater and grazing on South Field vegetation on which airborne soil was deposited; and by ingestion, dermal contact, and inhalation of contaminated groundwater. Exposure point concentrations for routes of exposure using airborne particulates or groundwater were estimated from air and groundwater modeling. Both RME and CT risks and hazards were estimated for the on-property farmer.

The RME risks and hazards for a South Field on-property farmer and resident child exposed to CPCs in surface soil and airborne particulates are given in Tables B.3.2-19(a) and B.3.2-19(b), respectively (Attachment B.III). The total RME risks were 1.1×10^{-2} and 1.0×10^{-3} respectively. The greatest risks posed to the RME farmer from surface soil were from radium-226 (7.8×10^{-3}), radium-228 (4.7×10^{-4}), thorium-228 (1.0×10^{-3}), thorium-232 (1.4×10^{-3}) and benzo(a)pyrene(3.4×10^{-4}). Additional CPCs contributed greater than 1.0×10^{-6}, however, contributed less than one percent of the total medium risk. The greatest risks posed to the resident child from surface soil were from radium-226 (5.9×10^{-4}), thorium-228 (7.7×10^{-5}), thorium-232 (1.1×10^{-4}), arsenic(1.4×10^{-5}) benzo(a)pyrene (1.5×10^{-4}) and benzo(a,h)anthracene(3.0×10^{-5}). Additional CPCs contributed greater than 1.0×10^{-6}, however, contributed less than one percent of the total medium risk. Total HIs did not exceed 1.0

for any single CPC, or the sum of CPCs, across pathways for exposure of either a future on-property farmer or resident child to CPCs in soil.

Risks and hazards associated with exposure to contaminants in groundwater for the RME farmer on-property farmer and resident child are given in Tables B.3.2-20(a) and B.3.2-20(b), respectively (Attachment B.III). Risks exceeding 1.0×10^{-6} are indicated for both the RME farmer and resident child. Total risk for the farmer was 1.1×10^{-3} due to ingestion of uranium-234 and uranium-238. Total risk for the resident child was 4.7×10^{-5} due to ingestion of the same compounds. Total HIs were 18 and 41 for the farmer and child, respectively, due to the presence of uranium-total in groundwater.

Risks and hazards associated with exposure to contaminants in homegrown produce for the RME farmer and resident child are given in Tables B.3.2-21(a) and B.3.2-21(b), respectively (Attachment B.III). The risk associated with homegrown produce for the farmer was 1.8×10^{-3} and for the resident child was 3.9×10^{-4}. This was mostly due to the estimated presence of radium-226, technetium-99, arsenic, benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, and dieldrin in produce. The HI exceeded 1.0 for both the farmer (5.5) and child (20.6) due to the presence of uranium-total in groundwater and estimated uptake of uranium-total into irrigated plants.

Risks and hazards associated with exposure to contaminants in beef and milk for the RME farmer and resident child are given in Tables B.3.2-22(a) and B.3.2-22(b), respectively (Attachment B.III). The risk associated with beef and milk for the farmer was 1.9×10^{-2} and for the child was 7.8×10^{-3}. This is largely due to the uptake of radium-226 and technetium-99 and benzo(a)pyrene, dibenzo(a,h) anthracene, and indeno(1,2,3-cd)pyrene by livestock. Additional CPCs contributed greater than 1.0×10^{-6}, but made up less than two percent of the total medium risks. Total HI from beef and milk for both the farmer and the child was below 1.0, child.

CT estimates of risk for the future on-property resident farmer associated with exposures to surface soil, groundwater, homegrown produce, and beef and milk are given in Tables B.3.2-23, B.3.2-24, B.3.2-25, and B.3.2-26, respectively (Attachment B.III). Total risk from soil was 9.3×10^{-4}, due predominantly to external radiation from radium-226 and thorium-232. Total risk from groundwater is 6.6×10^{-5}, homegrown produce is 9.9×10^{-5}, and beef and milk is 9.4×10^{-6}. The greatest proportion of the risks from groundwater was due to the presence of technetium-99, benzo(a)pyrene,

and dibenzo(a,h)anthracene in dust and uranium-234, and uranium-238 in drinking water and uptake into irrigated plants and by watered livestock. Total HI for produce was 2.2 due to total uranium and total HI for groundwater was 8.3 also due to uranium-total.

B.3.2.4.4 Future On-Property (South Field) Homebuilder

Risks were calculated for a future homebuilder ingesting, inhaling, or coming into dermal contact with surface and subsurface soil within the South Field. The risk of external radiation resulting from exposure to subsurface soil was also determined.

The risks and hazards for an on-property homebuilder exposed to contaminated subsurface soils while building a home on the South Field are given in Table B.3.2-27 (Attachment B.III). The total risk due to all CPCs by all routes of exposure was 1.1×10^{-5}. The major contribution to total risk is from radium-226 (2.6×10^{-6}), thorium-232 (2.1×10^{-6}), and thorium-228 (1.6×10^{-6}) via external radiation. Arsenic contributed 1.0×10^{-6} ILCR due to dermal contact. HI did not exceed 1.0 for any individual CPC.

B.3.2.4.5 Future Great Miami River User

Risks on hazards associated with the future adult users of the Great Miami River were calculated. These users include recreational user (Table B.3.2-28(a)), agricultural user (Table B.3.2-28(b) and (c)), and residential user (Table B.3.2-28(d)). For the recreational user, the total risk was 4.2×10^{-6} due primarily to the ingestion of fish containing radium-226(1.3×10^{-6}) and technetium-99(2.0×10^{-6}). For the agricultural user, total risk for consumption of beef and milk was 4.4×10^{-6}, and for homegrown produce total risk was 1.9×10^{-8}. Total risk for the residential user was 6.3×10^{-8}. No HIs exceeded 1.0.

B.3.2.5 Risks Due to Estimated Radium-222 Emission

Concentrations of indoor air radon at the South Field were estimated from South Field subsurface soil radium-226 concentrations as described in Attachment I. The results shown in Table

B.3.2-30, indicate that potential residents of a structure built on a slab-type foundation have a considerably higher risk than residents of a structure with a basement; this is due to surface soil concentrations of radium-226. Carcinogenic risk associated with a house on a slab foundation are 4.2 x 10^{-3} for a child, 4.9 x 10^{-3} for the CT scenario, and 4.9 x 10^{-2} for the RME resident. For future residents dwelling in a house with basement, the risk to a child would be 1.9 x 10^{-7}, with 2.3 x 10^{-7} risk to the CT resident, and 2.3 x 10^{-6} risk to an RME resident. For comparisons, the RME resident carcinogenic risk based on the EPA action level of 4 pCi/L (ASTDR 1990) is presented. The risk would be 1.1 x 10^{-2}. The higher risk associated with the slab foundation is primarily due to the higher permeability of the surface soil compared to the subsurface soil (see Solid Waste Landfill results where the surface and subsurface permeabilities are similar.

Ambient outdoor radon emissions potentially associated with the South Field, estimated as described in Section B.2.0, are summarized in Table B.3.2-31 for each receptor. Risks that would result at the South Field assuming radon emission were equivalent to what would naturally occur if radium-226 were present at background concentrations are presented for comparison. Risks exceeding 1.0 x 10^{-6} were associated with future on-property farm receptors (RME farmer, CT farmer, and child). The risks calculated were about 20 times what could be expected if radium-226 were present at the South Field at background concentrations.

B.3.2.6 Summary for South Field

Tables B.3.2-32 and B.3.2-33 summarize risk and hazard, respectively, associated with the South Field for receptors assuming current land use. The greatest risk posed to any current scenario receptor is to the groundskeeper. Total estimated risk to the current groundskeeper is 2.2 x 10^{-4} due primarily to radium-226 (1.5 x 10^{-4}), radium-228 (9.0 x 10^{-6}), thorium-228 (2.2 x 10^{-5}), thorium-232 (2.7 x 10^{-5}), and benzo(a)pyrene (6.7 x 10^{-6}) in surface soil which accounted for 98 percent of the total receptor risk. Total HI for this receptor was less than 1.0.

Total carcinogenic risk to the trespassing youth was 1.0 x 10^{-4}. This was due mostly to ingestion of radium-226 (4.0 x 10^{-5}), radium-228 (2.4 x 10^{-6}), thorium-228 (5.3 x 10^{-6}), and thorium-232 (7.3 x 10^{-6}) in soil which accounted for approximately 54 percent of the total receptor risk and radium-228

TABLE B.3.2-30

CARCINOGENIC RISK ASSOCIATED WITH INDOOR RADON: SOUTH FIELD[a]

Type Structure	RME	CT	Child	RME Risk-based on EPA Action Level[b]
House on Slab	4.9×10^{-2}	4.9×10^{-3}	4.2×10^{-3}	1.1×10^{-2}
House with Basement	2.3×10^{-6}	2.3×10^{-7}	1.9×10^{-7}	1.1×10^{-2}

[a]Results obtained from Indoor Radon Modeling Studies (Attachment I) using radon-226 concentrations in South Field subsurface soil

[b]EPA Action level of 4 pCi/L (ASTDR 1990f)

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TABLE B.3.2-31
SOUTH FIELD
RISKS DUE TO ESTIMATED RN-222 EMISSION

	Subunit			Background		
	Maximum RN-222 Air Concentration (pCi/m3)*	Intake (pCi)	Risk	Background RN-222 Air Concentration (pCi/m3)**	Intake (pCi)	Risk
Current Trespassing Youth	7.7E+01	1.6E+05	1.2E-06	3.4E+00	7.0E+03	5.4E-08
Current/Future Off-Property Farmer	4.9E+00	5.7E+05	4.4E-06	2.2E-01	2.5E+04	1.9E-07
Current/Future Off-Property Child	4.9E+00	1.0E+04	7.9E-08	2.2E-01	4.5E+02	3.5E-09
Current Groundskeeper	7.7E+01	1.4E+06	1.0E-05	3.4E+00	5.9E+04	4.6E-07
Future Expanded Trespasser (Adult + Child)	7.7E+01	2.5E+05	1.9E-06	3.4E+00	1.1E+04	8.5E-08
Future, RME On-Property Farmer	6.8E+01	7.8E+06	6.0E-05	3.0E+00	3.4E+05	2.6E-06
Future, CT On-Property Farmer	6.8E+01	5.8E+05	4.5E-06	3.0E+00	2.5E+04	2.0E-07
Future On-Property Child	6.8E+01	1.4E+05	1.1E-06	3.0E+00	6.2E+03	4.8E-08

*Value represents maximum surface soil hit of 30.8 pCi/g.
**Assumes RA-226 concentration is 1.228 pCi/g in surface soil and 0.78 pCi/g in subsurface soil.

TABLE B.3.2-32
CURRENT LAND USE
SOUTH FIELD
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137	2.1E-07	0.36%	0.21%	8.0E-13	0.00%	0.00%	1.5E-14	0.00%	0.00%	N/A		
	NP-237	2.0E-08	0.03%	0.02%	5.3E-10	0.28%	0.08%	9.6E-12	0.23%	0.00%	N/A		
	PU-238	4.0E-10	0.00%	0.00%	3.8E-10	0.20%	0.06%	7.0E-12	0.17%	0.00%	N/A		
	PU-239/240	2.7E-10	0.00%	0.00%	2.4E-10	0.13%	0.04%	4.4E-12	0.11%	0.00%	N/A		
	RA-226	4.0E-05	67.68%	39.24%	1.8E-08	9.53%	2.84%	3.3E-10	8.08%	0.14%	N/A		
	RA-228	2.4E-06	4.10%	2.38%	2.3E-10	0.12%	0.04%	4.1E-12	0.10%	0.00%	N/A		
	SR-90	6.8E-10	0.00%	0.00%	8.4E-12	0.00%	0.00%	1.5E-13	0.00%	0.00%	N/A		
	TC-99	2.2E-09	0.00%	0.00%	1.0E-10	0.05%	0.02%	1.8E-12	0.04%	0.00%	N/A		
	TH-228	5.3E-06	9.00%	5.22%	2.9E-08	15.25%	4.54%	5.3E-10	12.93%	0.22%	N/A		
	TH-230	1.1E-08	0.02%	0.01%	3.4E-08	17.73%	5.27%	6.2E-10	15.04%	0.26%	N/A		
	TH-232	7.3E-06	12.36%	7.17%	3.7E-08	19.44%	5.78%	6.7E-10	16.49%	0.28%	N/A		
	U-234	6.3E-09	0.01%	0.01%	1.9E-08	9.96%	2.96%	3.5E-10	8.45%	0.14%	N/A		
	U-235/236	4.6E-08	0.08%	0.05%	1.9E-09	0.98%	0.29%	3.4E-11	0.83%	0.01%	N/A		
	U-238	8.5E-08	0.14%	0.08%	4.1E-08	21.43%	6.38%	7.4E-10	18.18%	0.31%	N/A		
	Total Radiological Risk	5.5E-05	93.78%	54.38%	1.8E-07	95.11%	28.29%	3.3E-09	80.66%	1.38%			
	Aroclor-1254	1.4E-07	0.24%	0.14%	5.2E-09	2.70%	0.80%	4.4E-10	10.69%	0.18%	N/A		
	Aroclor-1260	8.1E-08	0.14%	0.08%	1.6E-10	0.08%	0.02%	1.3E-11	0.33%	0.01%	N/A		
	Arsenic	1.7E-07	0.29%	0.17%	2.7E-09	1.42%	0.42%	2.3E-10	5.62%	0.10%	N/A		
	Benzo(a)anthracene	1.3E-07	0.22%	0.13%	1.8E-10	0.09%	0.03%	1.5E-11	0.37%	0.01%	N/A		
	Benzo(a)pyrene	2.2E-06	3.78%	2.19%	ND			ND			N/A		
	Benzo(b)fluoranthene	1.5E-07	0.25%	0.14%	2.1E-11	0.01%	0.00%	1.8E-12	0.04%	0.00%	N/A		
	Benzo(k)fluoranthene	1.7E-08	0.03%	0.02%	3.8E-10	0.20%	0.06%	3.2E-11	0.78%	0.01%	N/A		
	Beryllium	1.3E-07	0.22%	0.13%	ND			ND			N/A		
	Dibenzo(a,h)anthracene	4.5E-07	0.76%	0.44%	5.5E-10	0.29%	0.09%	4.6E-11	1.14%	0.02%	N/A		
	Dieldrin	2.5E-08	0.04%	0.02%	7.6E-12	0.00%	0.00%	6.4E-13	0.02%	0.00%	N/A		
	Indeno(1,2,3-cd)pyrene	1.4E-07	0.24%	0.14%	1.7E-10	0.09%	0.03%	1.5E-11	0.36%	0.01%	N/A		
	Total Chemical Risk	3.7E-06	6.22%	3.60%	9.4E-09	4.89%	1.45%	7.9E-10	19.34%	0.33%			
	Total	5.9E-05	100.00%	57.98%	1.9E-07	100.00%	29.75%	4.1E-09	100.00%	1.71%			

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TABLE B.3.2-32
(continued)

Medium	Parameter	Grounds keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv. Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air '	CS-137	8.0E-07	0.36%	0.36%	N/A			N/A			N/A		
	NP-237	7.9E-08	0.04%	0.04%	N/A			N/A			N/A		
	PU-238	3.0E-09	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	2.0E-09	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	1.5E-04	68.03%	68.03%	N/A			N/A			N/A		
	RA-228	9.0E-06	4.10%	4.10%	N/A			N/A			N/A		
	SR-90	5.1E-09	0.00%	0.00%	N/A			N/A			N/A		
	TC-99	1.6E-08	0.01%	0.01%	N/A			N/A			N/A		
	TH-228	2.2E-05	9.84%	9.84%	N/A			N/A			N/A		
	TH-230	3.8E-08	0.02%	0.02%	N/A			N/A			N/A		
	TH-232	2.7E-05	12.45%	12.45%	N/A			N/A			N/A		
	U-234	3.0E-08	0.01%	0.01%									
	U-235/236	2.1E-07	0.09%	0.09%									
	U-238	3.0E-07	0.14%	0.14%	N/A			N/A			N/A		
	Total Radiological Risk	2.1E-04	95.10%	95.10%	N/A			N/A			N/A		
	Aroclor-1254	1.9E-07	0.09%	0.09%	N/A			N/A			N/A		
	Aroclor-1260	1.1E-07	0.05%	0.05%	N/A			N/A			N/A		
	Arsenic	6.7E-07	0.30%	0.30%	N/A			N/A			N/A		
	Benzo(a)anthracene	3.9E-07	0.18%	0.18%	N/A			N/A			N/A		
	Benzo(a)pyrene	6.7E-06	3.05%	3.05%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	4.4E-07	0.20%	0.20%	N/A			N/A			N/A		
	Benzo(k)fluoranthene	5.2E-08	0.02%	0.02%	N/A			N/A			N/A		
	Beryllium	4.0E-07	0.18%	0.18%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	1.4E-06	0.62%	0.62%	N/A			N/A			N/A		
	Dieldrin	3.5E-08	0.02%	0.02%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	4.3E-07	0.19%	0.19%	N/A			N/A			N/A		
	Total Chemical Risk	1.1E-05	4.90%	4.90%									
	Total	2.2E-04	100.00%	100.00%									

TABLE B.3.2-32
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	%.Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	6.6E-09	0.04%	0.01%	N/A			N/A			N/A		
	PU-238	9.6E-11	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	1.3E-05	89.71%	13.07%	N/A			N/A			N/A		
	RA-228	8.1E-07	5.45%	0.79%	N/A			N/A			N/A		
	SR-90	2.1E-11	0.00%	0.00%	N/A			N/A			N/A		
	TC-99	3.0E-10	0.00%	0.00%	N/A			N/A			N/A		
	U-234	5.1E-10	0.00%	0.00%	N/A			N/A			N/A		
	U-235/236	1.4E-08	0.10%	0.01%	N/A			N/A			N/A		
	U-238	2.3E-08	0.16%	0.02%	N/A			N/A			N/A		
	Total Radiological Risk	1.4E-05	95.47%	13.91%									
	Benzo(a)pyrene	4.7E-07	3.17%	0.46%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	3.1E-08	0.21%	0.03%	N/A			N/A			N/A		
	Arsenic	8.2E-08	0.56%	0.08%	N/A			N/A			N/A		
	Beryllium	2.8E-08	0.19%	0.03%	N/A			N/A			N/A		
	Benzo(a)anthracene	1.4E-08	0.09%	0.01%	N/A			N/A			N/A		
	Dieldrin	5.2E-10	0.00%	0.00%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	4.7E-08	0.32%	0.05%	N/A			N/A			N/A		
	Total Chemical Risk	6.7E-07	4.53%	0.66%									
	Total	1.5E-05	100.00%	14.57%									

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TABLE B.3.2-32
(continued)

Medium	Parameter	Grounds keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv. Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												

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TABLE B.3.2-32
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	3.8E-09	0.01%	0.00%	N/A			N/A			N/A		
	PU-238	1.0E-10	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	9.3E-08	0.33%	0.09%	N/A			N/A			N/A		
	RA-228	1.5E-09	0.01%	0.00%	N/A			N/A			N/A		
	SR-90	9.1E-10	0.00%	0.00%	N/A			N/A			N/A		
	TC-99	4.7E-07	1.70%	0.47%	N/A			N/A			N/A		
	U-234	4.9E-08	0.18%	0.05%	N/A			N/A			N/A		
	U-235/236	4.3E-09	0.02%	0.00%	N/A			N/A			N/A		
	U-238	9.2E-08	0.33%	0.09%	N/A			N/A			N/A		
	Total Radiological Risk	7.2E-07	2.58%	0.71%									
	Arsenic	3.7E-06	13.28%	3.64%	N/A			N/A			N/A		
	Benzo(a)anthracene	4.1E-09	0.01%	0.00%	N/A			N/A			N/A		
	Benzo(a)pyrene	3.0E-08	0.11%	0.03%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	5.0E-10	0.00%	0.00%	N/A			N/A			N/A		
	Beryllium	1.2E-08	0.04%	0.01%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	6.1E-09	0.02%	0.01%	N/A			N/A			N/A		
	Dieldrin	2.3E-05	83.95%	23.04%	N/A			N/A			N/A		
	Total Chemical Risk	2.7E-05	97.42%	26.74%									
	Total	2.8E-05	100.00%	27.45%									
GMR Surface Water	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												

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January 21, 1995

TABLE B.3.2-32
(continued)

Medium	Parameter	Grounds keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv. Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
GMR Surface Water	NP-237	N/A			1.0E-08	0.25%	0.25%	2.6E-10	0.41%	0.41%	N/A		
	PU-238	N/A			7.2E-10	0.02%	0.02%	7.1E-12	0.01%	0.01%	N/A		
	RA-226	N/A			1.3E-06	30.40%	30.40%	6.3E-09	10.10%	10.10%	N/A		
	RA-228	N/A			2.1E-08	0.49%	0.49%	1.0E-10	0.16%	0.16%	N/A		
	SR-90	N/A			7.6E-07	17.95%	17.95%	6.2E-09	9.94%	9.94%	N/A		
	TC-99	N/A			2.0E-06	46.33%	46.33%	3.2E-08	51.33%	51.33%	N/A		
	U-234	N/A			2.6E-08	0.63%	0.63%	3.3E-09	5.21%	5.21%	N/A		
	U-235/236	N/A			2.3E-09	0.05%	0.05%	2.9E-10	0.46%	0.46%	N/A		
	U-238	N/A			5.0E-08	1.19%	1.19%	6.2E-09	9.86%	9.86%	N/A		
	Total Radiological Risk				4.1E-06	97.31%	97.31%	5.5E-08	87.49%	87.49%			
	Arsenic	N/A			1.8E-10	0.00%	0.00%	1.0E-09	1.59%	1.59%	N/A		
	Beryllium	N/A			2.0E-11	0.00%	0.00%	5.1E-10	0.81%	0.81%	N/A		
	Benzo(a)anthracene	N/A			4.1E-10	0.01%	0.01%	4.4E-10	0.71%	0.71%	N/A		
	Benzo(a)pyrene	N/A			6.4E-08	1.51%	1.51%	3.2E-09	5.05%	5.05%	N/A		
	Benzo(b)fluoranthene	N/A			1.1E-09	0.03%	0.03%	5.4E-11	0.09%	0.09%	N/A		
	bis(2-Ethylhexyl)phthalate	N/A			1.5E-14	0.00%	0.00%	2.6E-11	0.04%	0.04%	N/A		
	Dibenzo(a,h)anthracene	N/A			4.8E-08	1.14%	1.14%	6.6E-10	1.04%	1.04%	N/A		
	Dieldrin	N/A			1.9E-12	0.00%	0.00%	2.0E-09	3.18%	3.18%	N/A		
	Total Chemical Risk				1.1E-07	2.69%	2.69%	7.9E-09	12.51%	12.51%			
	Total				4.2E-06	100.00%	100.00%	6.3E-08	100.00%	100.00%			

TABLE B.3.2-32
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	CS-137	N/A			2.0E-11	0.02%	0.00%	1.3E-12	0.01%	0.00%	N/A		
	NP-237	N/A			5.1E-11	0.06%	0.01%	3.6E-12	0.01%	0.00%	N/A		
	PU-238	N/A			2.8E-11	0.03%	0.00%	1.9E-12	0.01%	0.00%	N/A		
	PU-239/240	N/A			1.9E-11	0.02%	0.00%	1.3E-12	0.01%	0.00%	N/A		
	RA-226	N/A			9.1E-09	10.70%	1.41%	1.1E-09	4.45%	0.47%	N/A		
	RA-228	N/A			4.2E-10	0.49%	0.07%	2.9E-11	0.12%	0.01%	N/A		
	SR-90	N/A			6.8E-11	0.08%	0.01%	4.7E-12	0.02%	0.00%	N/A		
	TC-99	N/A			2.1E-10	0.25%	0.03%	1.5E-11	0.06%	0.01%	N/A		
	TH-228	N/A			2.6E-10	0.31%	0.04%	1.8E-11	0.07%	0.01%	N/A		
	TH-230	N/A			2.0E-10	0.23%	0.03%	1.4E-11	0.06%	0.01%	N/A		
	TH-232	N/A			7.4E-10	0.88%	0.12%	5.2E-11	0.21%	0.02%	N/A		
	U-234	N/A			1.5E-10	0.18%	0.02%	1.1E-11	0.04%	0.00%	N/A		
	U-235/236	N/A			1.5E-11	0.02%	0.00%	1.1E-12	0.00%	0.00%	N/A		
	U-238	N/A			2.8E-10	0.33%	0.04%	2.0E-11	0.08%	0.01%	N/A		
	Total Radiological Risk				1.2E-08	13.60%	1.79%	1.3E-09	5.14%	0.54%			
	Aroclor-1254	N/A			1.3E-09	1.58%	0.21%	3.8E-10	1.53%	0.16%	N/A		
	Aroclor-1260	N/A			3.7E-10	0.44%	0.06%	1.1E-10	0.46%	0.05%	N/A		
	Arsenic	N/A			9.1E-09	10.73%	1.41%	2.9E-09	11.59%	1.22%	N/A		
	Benzo(a)anthracene	N/A			2.6E-09	3.02%	0.40%	8.3E-10	3.32%	0.35%	N/A		
	Benzo(a)pyrene	N/A			4.3E-08	50.37%	6.64%	1.4E-08	55.60%	5.85%	N/A		
	Benzo(b)fluoranthene	N/A			2.8E-09	3.30%	0.44%	9.2E-10	3.65%	0.38%	N/A		
	Benzo(k)fluoranthene	N/A			3.3E-10	0.39%	0.05%	1.1E-10	0.43%	0.05%	N/A		
	Beryllium	N/A			2.6E-09	3.05%	0.40%	8.4E-10	3.36%	0.35%	N/A		
	Dibenzo(a,h)anthracene	N/A			8.5E-09	10.01%	1.32%	2.8E-09	11.09%	1.17%	N/A		
	Dieldrin	N/A			2.9E-10	0.34%	0.04%	8.3E-11	0.33%	0.03%	N/A		
	Indeno(1,2,3-cd)pyrene	N/A			2.7E-09	3.16%	0.42%	8.8E-10	3.50%	0.37%	N/A		
	Total Chemical Risk				7.3E-08	86.40%	11.38%	2.4E-08	94.86%	9.97%			
	Total				8.5E-08	100.00%	13.18%	2.5E-08	100.00%	10.51%			

000229

TABLE B.3.2-32
(continued)

Medium	Parameter	Grounds keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv. Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	CS-137	N/A			N/A			N/A			N/A		
	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
Homegrown Produce (Dust Affected) (continued)	Aroclor-1254	N/A			N/A			N/A			N/A		
	Aroclor-1260	N/A			N/A			N/A			N/A		
	Arsenic	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	Benzo(k)fluoranthene	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												

000280

1-6502

TABLE B.3.2-32
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
Beef/Milk (Dust Affected)	CS-137	N/A			4.4E-11	0.01%	0.01%	5.7E-12	0.00%	0.00%	5.4E-10	0.01%	0.01%
	NP-237	N/A			1.5E-13	0.00%	0.00%	1.2E-14	0.00%	0.00%	1.9E-12	0.00%	0.00%
	PU-238	N/A			1.2E-15	0.00%	0.00%	1.3E-16	0.00%	0.00%	1.5E-14	0.00%	0.00%
	PU-239/240	N/A			9.0E-16	0.00%	0.00%	9.5E-17	0.00%	0.00%	1.1E-14	0.00%	0.00%
	RA-226	N/A			2.9E-09	0.79%	0.45%	5.1E-10	0.24%	0.21%	3.5E-08	0.79%	0.79%
	RA-228	N/A			3.5E-11	0.01%	0.01%	6.1E-12	0.00%	0.00%	4.3E-10	0.01%	0.01%
	SR-90	N/A			1.7E-11	0.00%	0.00%	3.2E-12	0.00%	0.00%	2.1E-11	0.00%	0.00%
	TC-99	N/A			4.0E-10	0.11%	0.06%	6.6E-11	0.03%	0.03%	4.8E-09	0.11%	0.11%
	TH-228	N/A			2.6E-13	0.00%	0.00%	4.1E-14	0.00%	0.00%	3.2E-12	0.00%	0.00%
	TH-230	N/A			1.1E-12	0.00%	0.00%	1.8E-13	0.00%	0.00%	1.4E-11	0.00%	0.00%
	TH-232	N/A			4.2E-12	0.00%	0.00%	6.7E-13	0.00%	0.00%	5.2E-11	0.00%	0.00%
	U-234	N/A			1.5E-11	0.00%	0.00%	2.8E-12	0.00%	0.00%	1.9E-10	0.00%	0.00%
	U-235/236	N/A			1.6E-12	0.00%	0.00%	2.9E-13	0.00%	0.00%	1.9E-11	0.00%	0.00%
	U-238	N/A			2.9E-11	0.01%	0.00%	5.3E-12	0.00%	0.00%	3.5E-10	0.01%	0.01%
	Total Radiological Risk				3.4E-09	0.94%	0.53%	6.0E-10	0.28%	0.25%	4.2E-08	0.93%	0.93%
	Aroclor-1254	N/A			7.1E-09	1.93%	1.10%	4.1E-09	1.94%	1.71%	8.6E-08	1.93%	1.93%
	Aroclor-1260	N/A			4.4E-08	11.89%	6.79%	2.5E-08	11.99%	10.52%	5.3E-07	11.91%	11.91%
	Arsenic	N/A			1.3E-09	0.35%	0.20%	3.0E-10	0.14%	0.13%	1.5E-08	0.35%	0.35%
	Benzo(a)anthracene	N/A			2.8E-09	0.75%	0.43%	1.6E-09	0.76%	0.67%	3.4E-08	0.75%	0.75%
	Benzo(a)pyrene	N/A			1.3E-07	34.67%	19.79%	7.3E-08	35.00%	30.72%	1.5E-06	34.68%	34.68%
	Benzo(b)fluoranthene	N/A			8.6E-09	2.35%	1.34%	5.0E-09	2.38%	2.09%	1.1E-07	2.35%	2.35%
	Benzo(k)fluoranthene	N/A			6.2E-09	1.68%	0.96%	3.6E-09	1.70%	1.49%	7.5E-08	1.68%	1.68%
	Beryllium	N/A			1.9E-10	0.05%	0.03%	2.9E-11	0.01%	0.01%	2.3E-09	0.05%	0.05%
	Dibenzo(a,h)anthracene	N/A			1.4E-07	38.79%	22.14%	8.2E-08	39.14%	34.35%	1.7E-06	38.77%	38.77%
	Dieldrin	N/A			9.2E-14	0.00%	0.00%	5.3E-14	0.00%	0.00%	1.1E-12	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	N/A			2.4E-08	6.59%	3.76%	1.4E-08	6.65%	5.84%	2.9E-07	6.59%	6.59%
	Total Chemical Risk				3.6E-07	99.06%	56.54%	2.1E-07	99.72%	87.52%	4.4E-06	99.07%	99.07%
	Total				3.7E-07	100.00%	57.07%	2.1E-07	100.00%	87.77%	4.5E-06	100.00%	100.00%

000284

TABLE B.3.2-32
(continued)

Medium	Parameter	Grounds keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv. Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			7.9E-11	0.42%	0.00%
	PU-238	N/A			N/A			N/A			2.2E-12	0.01%	0.00%
	RA-226	N/A			N/A			N/A			2.0E-09	10.54%	0.04%
	RA-228	N/A			N/A			N/A			3.1E-11	0.16%	0.00%
	SR-90	N/A			N/A			N/A			2.2E-09	11.51%	0.05%
	TC-99	N/A			N/A			N/A			1.0E-08	55.04%	0.23%
	U-234	N/A			N/A			N/A			9.9E-10	5.24%	0.02%
	U-235/236	N/A			N/A			N/A			8.6E-11	0.46%	0.00%
	U-238	N/A			N/A			N/A			1.9E-09	9.93%	0.04%
	Total Radiological Risk										1.8E-08	93.33%	0.40%
	Arsenic	N/A			N/A			N/A			3.9E-10	2.06%	0.01%
	Beryllium	N/A			N/A			N/A			8.3E-11	0.44%	0.00%
	Benzo(a)anthracene	N/A			N/A			N/A			2.8E-11	0.15%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			2.0E-10	1.04%	0.00%
	Benzo(b)fluoranthene	N/A			N/A			N/A			3.3E-12	0.02%	0.00%
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			4.2E-12	0.02%	0.00%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			3.9E-11	0.21%	0.00%
	Dieldrin	N/A			N/A			N/A			5.1E-10	2.73%	0.01%
	Total Chemical Risk										1.3E-09	6.67%	0.03%
	Total										1.9E-08	100.00%	0.43%
Beef/Milk (Dust Affected)	CS-137	N/A			N/A			N/A			N/A		
	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Aroclor-1254	N/A			N/A			N/A			N/A		
	Aroclor-1260	N/A			N/A			N/A			N/A		
	Arsenic	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	Benzo(k)fluoranthene	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												

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TABLE B.3.2-32
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
ALL MEDIA		**1.0E-04**			**6.4E-07**			**2.4E-07**			**4.5E-06**		

000283

TABLE B.3.2-32
(continued)

Medium	Parameter	Grounds keeper	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv. Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			1.8E-10	0.00%	0.00%
	PU-238	N/A			N/A			N/A			4.0E-14	0.00%	0.00%
	RA-226	N/A			N/A			N/A			2.4E-08	0.55%	0.55%
	RA-228	N/A			N/A			N/A			2.9E-10	0.01%	0.01%
	SR-90	N/A			N/A			N/A			5.2E-08	1.19%	1.18%
	TC-99	N/A			N/A			N/A			4.3E-06	97.73%	97.31%
	U-234	N/A			N/A			N/A			7.3E-09	0.17%	0.17%
	U-235/236	N/A			N/A			N/A			6.4E-10	0.01%	0.01%
	U-238	N/A			N/A			N/A			1.4E-08	0.32%	0.31%
	Total Radiological Risk										4.4E-06	99.97%	99.54%
	Arsenic	N/A			N/A			N/A			7.1E-11	0.00%	0.00%
	Beryllium	N/A			N/A			N/A			4.5E-12	0.00%	0.00%
	Benzo(a)anthracene	N/A			N/A			N/A			2.7E-11	0.00%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			5.1E-10	0.01%	0.01%
	Benzo(b)fluoranthene	N/A			N/A			N/A			8.9E-12	0.00%	0.00%
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			6.1E-11	0.00%	0.00%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			5.7E-10	0.01%	0.01%
	Dieldrin	N/A			N/A			N/A			1.5E-13	0.00%	0.00%
	Total Chemical Risk										1.2E-09	0.03%	0.03%
	Total										4.4E-06	100.00%	99.57%
ALL MEDIA		**2.2E-04**			**4.2E-06**			**6.3E-08**			**4.4E-06**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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TABLE B.3.2-33
CURRENT LAND USE
SOUTH FIELD
SUMMARY OF TOTAL NONCARCINOGENIC HAZARD

Medium	Parameter	Trespassing Youth	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Farmer	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard	User of Milk and Meat	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/ Air	Arsenic	1.9E-03	40.06%	0.00%	ND			ND			N/A		
	Beryllium	2.6E-03	56.12%	0.00%	ND			ND			N/A		
	Dieldrin	1.8E-04	3.83%	0.00%	ND			ND			N/A		
	Total	4.7E-03	100.00%	0.01%									
Sediment	Arsenic	9.2E-04	18.78%	0.00%	N/A			N/A			N/A		
	Beryllium	3.2E-03	65.77%	0.01%	N/A			N/A			N/A		
	U-TOTAL	5.5E-04	11.38%	0.00%	N/A			N/A			N/A		
	Dieldrin	2.0E-04	4.07%	0.00%	N/A			N/A			N/A		
	Total	4.9E-03	100.00%	0.01%									
Surface Water	Arsenic	4.1E-02	0.08%	0.08%	N/A			N/A			N/A		
	Beryllium	2.4E-02	0.05%	0.05%	N/A			N/A			N/A		
	Dieldrin	1.7E-01	0.32%	0.32%	N/A			N/A			N/A		
	U-Total	5.3E+01	99.55%	99.54%	N/A			N/A			N/A		
	Total	5.3E+01	100.00%	99.98%									
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A		
	Total	N/A			N/A			N/A			N/A		
Homegrown Produce (Dust Affected)	Arsenic	N/A			1.7E-05	98.00%	86.15%	6.5E-05	98.75%	89.61%	N/A		
	Beryllium	N/A			8.0E-08	0.45%	0.40%	1.8E-07	0.28%	0.26%	N/A		
	Dieldrin	N/A			2.7E-07	1.55%	1.36%	6.4E-07	0.97%	0.88%	N/A		
	Total				1.8E-05	100.00%	87.91%	6.5E-05	100.00%	90.75%			
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (Dust Affected)	Arsenic	N/A			2.4E-06	99.64%	12.05%	6.7E-06	99.75%	9.22%	2.9E-05	99.64%	99.64%
	Beryllium	N/A			8.7E-09	0.36%	0.04%	1.6E-08	0.24%	0.02%	1.1E-07	0.36%	0.36%
	Dieldrin	N/A			1.1E-10	0.00%	0.00%	7.7E-10	0.01%	0.00%	1.4E-09	0.00%	0.00%
	Total				2.4E-06	100.00%	12.09%	6.7E-06	100.00%	9.25%	3.0E-05	100.00%	100.00%
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A		
	Total												
ALL MEDIA		5.3E+01			2.0E-05			7.2E-05			3.0E-05		

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TABLE B.3.2-33
(continued)

Medium	Parameter	Grounds-keeper	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Resid. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/ Air	Arsenic	*3.5E-03*	*68.36%*	*68.36%*	N/A			N/A			N/A		
	Beryllium	*1.5E-03*	*29.30%*	*29.30%*	N/A			N/A			N/A		
	Dieldrin	*1.2E-04*	*2.34%*	*2.34%*	N/A			N/A			N/A		
	Total	*5.1E-03*	*100.00%*	*100.00%*									
Sediment	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Total												
Surface Water		N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A		
	Total												
GMR Surface	Arsenic	N/A			7.9E-07	31.81%	31.81%	1.9E-06	1.39%	1.39%	N/A		
	Beryllium	N/A			2.8E-09	0.11%	0.11%	1.5E-08	0.01%	0.01%	N/A		
	Dieldrin	N/A			5.7E-09	0.23%	0.23%	5.4E-07	0.40%	0.40%	N/A		
	U-TOTAL	N/A			1.7E-06	67.85%	67.85%	1.3E-04	98.20%	98.20%	N/A		
	Total	N/A			*2.5E-06*	100.00%	100.00%	*1.4E-04*	100.00%	100.00%	N/A		
Homegrown Produce (Dust Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A		
	Total												
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			7.4E-07	1.86%	1.86%
	Beryllium	N/A			N/A			N/A			3.9E-09	0.01%	0.01%
	Dieldrin	N/A			N/A			N/A			6.4E-07	1.62%	1.61%
	U-TOTAL	N/A			N/A			N/A			3.8E-05	96.51%	96.13%
	Total										4.0E-05	100.00%	99.61%
Beef/Milk (Dust Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			1.4E-07	86.81%	0.34%
	Beryllium	N/A			N/A			N/A			2.1E-10	0.13%	0.00%
	Dieldrin	N/A			N/A			N/A			1.9E-10	0.12%	0.00%
	U-TOTAL	N/A			N/A			N/A			2.0E-08	12.94%	0.05%
	Total										1.6E-07	100.00%	0.39%
ALL MEDIA		*5.1E-03*			*2.5E-06*			*1.4E-04*			4.0E-05		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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(1.3×10^{-5}) in sediment which accounted for approximately 13 percent of total receptor risk. Total HI for this receptor was 53 due primarily from uranium-total in surface water.

For the off-property farmer and resident child, total risks were $6.4 \cdot 10^{-7}$ and 2.4×10^{-7}, respectively, due primarily through the ingestion of beef and milk pathway. Total HIs for both farmers were less than 1.0.

For the current user of milk and meat, total risk was 4.5×10^{-6}, due primarily to dibenzo(a,h)anthracene (1.7×10^{-6}) and benzo(a)pyrene (1.5×10^{-6}) in beef and milk products which accounted for approximately 73 percent of the total receptor risks. Total HI for this receptor was less than 1.0.

Tables B.3.2-34 and B.3.2-35 summarize risks and hazards, respectively, associated with the South Field for receptors assuming future land use. The greatest risks were associated with the on-property RME farmer and child, and the on-property CT farmer for which risks were 3.4×10^{-2}, 9.2×10^{-3}, and 2.0×10^{-3}, respectively. Risks to these on-property receptors were primarily through the ingestion of dust affected beef and milk products containing technetium-99 ($7.8\ 10^{-3}$, 1.3×10^{-3}, and 3.7×10^{-4}, respectively), benzo(a)pyrene (5.4×10^{-3}, 3.1×10^{-3}, 2.7×10^{-4}, respectively), dibenzo(a,h)anthracene (4.0×10^{-3}, 2.3×10^{-3}, 2.0×10^{-4}, respectively), benzo(b)fluoranthene (3.7×10^{-4}, 2.1×10^{-4}, and 1.9×10^{-5}, respectively), and indeno(1,2,3-cd)pyrene (7.8×10^{-4}, 4.5×10^{-4}, and 3.9×10^{-5}). Also contributing to the on-property risks were external radiation to radium-226 (7.8E-03, 6.5E-04, and 5.9E-04 respectively). Total hazards for the on-property receptors exceeded 1.0 (23, 63, and 11, respectively) due primarily to the presence of uranium-total in groundwater.

Risks to the off-property farmer and resident child (both federal and private ownership) were in the 1.0×10^{-6} to 1.0×10^{-4} range. The greatest proportion of the risks for the off-property farmer under private and federal ownership was attributable to the future estimated concentrations of uranium-234 (1.9×10^{-5}) and uranium-238 (3.6×10^{-5}) in groundwater which accounted for approximately 52 percent of the total receptor risk. For the off-property child under private ownership, the primary contributors to total risk were from ingestion of beef and milk products affected by dust containing dibenzo(a,h)anthracene (3.9×10^{-6}), benzo(a)pyrene (3.5×10^{-6}), and Aroclor-1260 (1.1×10^{-6}) which contributed 57 percent of the total receptor risk. For the off-property child under federal ownership, the primary contributors to total receptor risk were uranium-234 and uranium-238 in groundwater

L-6507

TABLE B.3.2-34
FUTURE LAND USE
SOUTH FIELD
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137	4.5E-07	0.37%	0.32%	2.9E-11	0.00%	0.00%	*8.0E-13*	*0.00%*	*0.00%*	5.2E-13	0.00%	0.00%	1.5E-14	0.00%	0.00%	5.7E-08	0.50%	0.50%
	NP-237	4.3E-08	0.04%	0.03%	1.9E-08	0.27%	0.02%	*5.3E-10*	*0.28%*	*0.00%*	3.4E-10	0.23%	0.00%	9.6E-12	0.23%	0.00%	2.9E-08	0.25%	0.25%
	PB-210																3.3E-07	2.92%	2.92%
	PU-238	9.8E-10	0.00%	0.00%	1.4E-08	0.20%	0.01%	*3.8E-10*	*0.20%*	*0.00%*	2.5E-10	0.17%	0.00%	7.0E-12	0.17%	0.00%	6.4E-09	0.06%	0.06%
	PU-239/240	6.6E-10	0.00%	0.00%	8.7E-09	0.13%	0.01%	*2.4E-10*	*0.13%*	*0.00%*	1.6E-10	0.11%	0.00%	4.4E-12	0.11%	0.00%	4.0E-09	0.04%	0.04%
	RA-224																1.9E-08	0.16%	0.16%
	RA-226	8.3E-05	68.57%	59.89%	6.5E-07	9.54%	0.61%	*1.8E-08*	*9.53%*	*0.02%*	1.2E-08	8.09%	0.08%	3.3E-10	8.08%	0.08%	2.6E-06	22.44%	22.44%
	RA-228	5.0E-06	4.15%	3.62%	8.1E-09	0.12%	0.01%	*2.3E-10*	*0.12%*	*0.00%*	1.5E-10	0.10%	0.00%	4.1E-12	0.10%	0.00%	5.9E-07	5.20%	5.20%
	RU-106																1.0E-09	0.01%	0.01%
	SR-90	1.9E-09	0.00%	0.00%	3.0E-10	0.00%	0.00%	*8.4E-12*	*0.00%*	*0.00%*	5.4E-12	0.00%	0.00%	1.5E-13	0.00%	0.00%			
	TC-99	6.1E-09	0.00%	0.00%	3.5E-09	0.05%	0.00%	*1.0E-10*	*0.05%*	*0.00%*	6.4E-11	0.04%	0.00%	1.8E-12	0.04%	0.00%			
	TH-228	1.1E-05	9.09%	7.94%	1.0E-06	15.26%	0.97%	*2.9E-08*	*15.25%*	*0.04%*	1.9E-08	12.95%	0.13%	5.3E-10	12.93%	0.13%	1.6E-06	13.85%	13.85%
	TH-230	1.9E-08	0.02%	0.01%	1.2E-06	17.72%	1.13%	*3.4E-08*	*17.73%*	*0.04%*	2.2E-08	15.03%	0.15%	6.2E-10	15.04%	0.15%	5.1E-07	4.43%	4.43%
	TH-232	1.5E-05	12.49%	10.91%	1.3E-06	19.47%	1.24%	*3.7E-08*	*19.44%*	*0.05%*	2.4E-08	16.51%	0.16%	6.7E-10	16.49%	0.16%	2.1E-06	18.66%	18.66%
	U-234	1.2E-08	0.01%	0.01%	6.8E-07	9.96%	0.63%	*1.9E-08*	*9.96%*	*0.02%*	1.2E-08	8.44%	0.08%	3.5E-10	8.45%	0.08%	3.2E-07	2.82%	2.82%
	U-235/236	9.6E-08	0.08%	0.07%	6.7E-08	0.98%	0.06%	*1.9E-09*	*0.98%*	*0.00%*	1.2E-09	0.83%	0.01%	3.4E-11	0.83%	0.01%	2.0E-07	1.76%	1.76%
	U-238	1.7E-07	0.14%	0.12%	1.5E-06	21.41%	1.36%	*4.1E-08*	*21.43%*	*0.05%*	2.6E-08	18.17%	0.18%	7.4E-10	18.18%	0.18%	8.2E-07	7.18%	7.18%
	Total Radiological Risk	1.2E-04	94.96%	82.94%	6.5E-06	95.12%	6.04%	*1.8E-07*	*95.11%*	*0.23%*	1.2E-07	80.69%	0.78%	3.3E-09	80.66%	0.78%	9.2E-06	80.28%	80.28%
	Aroclor-1254	5.2E-07	0.43%	0.37%													3.0E-07	2.67%	2.67%
	Aroclor-1260	3.0E-07	0.25%	0.22%													6.3E-08	0.55%	0.55%
	Arsenic	4.3E-07	0.35%	0.31%	1.8E-07	2.70%	0.17%	*5.2E-09*	*2.70%*	*0.01%*	1.6E-08	10.68%	0.10%	4.4E-10	10.69%	0.10%	1.1E-06	9.46%	9.46%
	Benzo(a)anthracene	1.9E-07	0.16%	0.14%	5.7E-09	0.08%	0.01%	*1.6E-10*	*0.08%*	*0.00%*	4.8E-10	0.33%	0.00%	1.3E-11	0.33%	0.00%	1.1E-08	0.10%	0.10%
	Benzo(a)pyrene	3.3E-06	2.70%	2.36%	9.6E-08	1.42%	0.09%	*2.7E-09*	*1.42%*	*0.00%*	8.2E-09	5.61%	0.05%	2.3E-10	5.62%	0.05%	1.2E-07	1.01%	1.01%
	Benzo(b)fluoranthene	2.2E-07	0.18%	0.16%	6.4E-09	0.09%	0.01%	*1.8E-10*	*0.09%*	*0.00%*	5.4E-10	0.37%	0.00%	1.5E-11	0.37%	0.00%	1.2E-08	0.11%	0.11%
	Benzo(k)fluoranthene	2.6E-08	0.02%	0.02%	7.5E-10	0.01%	0.00%	*2.1E-11*	*0.01%*	*0.00%*	6.4E-11	0.04%	0.00%	1.8E-12	0.04%	0.00%			
	Beryllium	1.9E-07	0.16%	0.14%	1.3E-08	0.20%	0.01%	*3.8E-10*	*0.20%*	*0.00%*	1.1E-09	0.78%	0.01%	3.2E-11	0.78%	0.01%	5.9E-07	5.14%	5.14%
	Dibenzo(a,h)anthracene	6.7E-07	0.55%	0.48%	2.0E-08	0.29%	0.02%	*5.5E-10*	*0.29%*	*0.00%*	1.7E-09	1.14%	0.01%	4.6E-11	1.14%	0.01%			
	Dieldrin	9.2E-08	0.08%	0.07%	2.7E-10	0.00%	0.00%	*7.6E-12*	*0.00%*	*0.00%*	2.3E-11	0.02%	0.00%	6.4E-13	0.02%	0.00%	1.2E-08	0.11%	0.11%
	Indeno(1,2,3-cd)pyrene	2.1E-07	0.17%	0.15%	6.2E-09	0.09%	0.01%	*1.7E-10*	*0.09%*	*0.00%*	5.2E-10	0.36%	0.00%	1.5E-11	0.36%	0.00%			
	Octachlorodibenzo-p-dioxin																4.4E-08	0.38%	0.38%
	Tetrachlorodibenzofuran																2.2E-08	0.19%	0.19%
	Total Chemical Risk	6.1E-06	5.04%	4.40%	3.3E-07	4.88%	0.31%	*9.4E-09*	*4.89%*	*0.01%*	2.8E-08	19.31%	0.19%	7.9E-10	19.34%	0.19%	2.3E-06	19.72%	19.72%
	Total	1.2E-04	100.00%	87.34%	6.8E-06	100.00%	6.35%	*1.9E-07*	*100.00%*	*0.24%*	1.5E-07	100.00%	0.97%	4.1E-09	100.00%	0.97%	1.1E-05	100.00%	100.00%

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TABLE B.3.2-34
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv esid. Use	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137	4.2E-05	0.36%	0.12%	3.5E-06	0.37%	0.17%	3.1E-06	0.30%	0.03%	N/A			N/A			N/A		
	NP-237	4.3E-06	0.04%	0.01%	3.5E-07	0.04%	0.02%	3.1E-07	0.03%	0.00%	N/A			N/A			N/A		
	PU-238	3.0E-07	0.00%	0.00%	1.9E-08	0.00%	0.00%	1.4E-08	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	2.0E-07	0.00%	0.00%	1.3E-08	0.00%	0.00%	9.5E-09	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	7.8E-03	68.39%	23.18%	6.5E-04	69.79%	31.68%	5.9E-04	55.96%	6.34%	N/A			N/A			N/A		
	RA-228	4.7E-04	4.12%	1.40%	3.9E-05	4.22%	1.92%	3.5E-05	3.36%	0.38%	N/A			N/A			N/A		
	SR-90	2.6E-07	0.00%	0.00%	1.2E-08	0.00%	0.00%	2.4E-08	0.00%	0.00%	N/A			N/A			N/A		
	TC-99	8.7E-07	0.01%	0.00%	4.3E-08	0.00%	0.00%	7.9E-08	0.01%	0.00%	N/A			N/A			N/A		
	TH-228	1.0E-03	9.14%	3.10%	8.7E-05	9.36%	4.25%	7.7E-05	7.38%	0.84%	N/A			N/A			N/A		
	TH-230	1.7E-05	0.15%	0.05%	1.3E-06	0.14%	0.06%	3.8E-07	0.04%	0.00%	N/A			N/A			N/A		
	TH-232	1.4E-03	12.55%	4.25%	1.2E-04	12.85%	5.84%	1.1E-04	10.15%	1.15%	N/A			N/A			N/A		
	U-234	9.9E-06	0.09%	0.03%	7.2E-07	0.08%	0.04%	2.3E-07	0.02%	0.00%	N/A			N/A			N/A		
	U-235/236	9.8E-06	0.09%	0.03%	8.1E-07	0.09%	0.04%	6.9E-07	0.07%	0.01%	N/A			N/A			N/A		
	U-238	3.5E-05	0.31%	0.10%	2.7E-06	0.29%	0.13%	1.5E-06	0.14%	0.02%	N/A			N/A			N/A		
	Total Radiological Risk	1.1E-02	95.25%	32.28%	9.0E-04	97.24%	44.15%	8.1E-04	77.46%	8.77%									
	Aroclor-1254	6.0E-06	0.05%	0.02%	1.5E-07	0.02%	0.01%	1.4E-06	0.13%	0.01%	N/A			N/A			N/A		
	Aroclor-1260	3.5E-06	0.03%	0.01%	8.5E-08	0.01%	0.00%	7.9E-07	0.08%	0.01%	N/A			N/A			N/A		
	Arsenic	3.5E-05	0.31%	0.10%	1.7E-06	0.18%	0.08%	1.4E-05	1.37%	0.15%	N/A			N/A			N/A		
	Benzo(a)anthracene	2.0E-05	0.17%	0.06%	9.5E-07	0.10%	0.05%	8.8E-06	0.84%	0.10%	N/A			N/A			N/A		
	Benzo(a)pyrene	3.4E-04	2.98%	1.01%	1.6E-05	1.75%	0.80%	1.5E-04	14.37%	1.63%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	2.2E-05	0.20%	0.07%	1.1E-06	0.12%	0.05%	9.9E-06	0.95%	0.11%	N/A			N/A			N/A		
	Benzo(k)fluoranthene	2.6E-06	0.02%	0.01%	1.3E-07	0.01%	0.01%	1.2E-06	0.11%	0.01%	N/A			N/A			N/A		
	Beryllium	2.0E-05	0.18%	0.06%	9.7E-07	0.10%	0.05%	8.9E-06	0.85%	0.10%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	6.9E-05	0.60%	0.20%	3.3E-06	0.35%	0.16%	3.0E-05	2.90%	0.33%	N/A			N/A			N/A		
	Dieldrin	1.2E-06	0.01%	0.00%	3.0E-08	0.00%	0.00%	2.8E-07	0.03%	0.00%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	2.2E-05	0.19%	0.06%	1.0E-06	0.11%	0.05%	9.6E-06	0.92%	0.10%	N/A			N/A			N/A		
	Total Chemical Risk	5.4E-04	4.75%	1.61%	2.6E-05	2.76%	1.26%	2.4E-04	22.54%	2.55%									
	Total	1.1E-02	100.00%	33.89%	9.3E-04	100.00%	45.40%	1.0E-03	100.00%	11.32%									

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TABLE B.3.2-34
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	6.6E-09	0.04%	0.00%	N/A			N/A			N/A			N/A			N/A		
	PU-238	1.0E-10	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	RA-226	1.3E-05	89.14%	9.51%	N/A			N/A			N/A			N/A			N/A		
	RA-228	8.1E-07	5.41%	0.58%	N/A			N/A			N/A			N/A			N/A		
	SR-90	2.2E-11	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	TC-99	3.2E-10	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-234	5.3E-10	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-235/236	1.4E-08	0.10%	0.01%	N/A			N/A			N/A			N/A			N/A		
	U-238	2.3E-08	0.16%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	1.4E-05	94.85%	10.12%															
	Benzo(a)pyrene	4.9E-07	3.30%	0.35%	N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	3.2E-08	0.22%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Arsenic	8.5E-08	0.57%	0.06%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	2.9E-08	0.19%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	2.9E-08	0.19%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Dieldrin	5.5E-10	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	9.9E-08	0.67%	0.07%	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	7.7E-07	5.15%	0.55%															
	Total	1.5E-05	100.00%	10.67%															
Groundwater	NP-237	N/A			3.0E-09	0.01%	0.00%	3.0E-09	0.01%	0.00%	1.3E-10	0.01%	0.00%	1.3E-10	0.01%	0.00%	N/A		
	SR-90	N/A			4.0E-09	0.01%	0.00%	4.0E-09	0.01%	0.00%	1.7E-10	0.01%	0.00%	1.7E-10	0.01%	0.00%	N/A		
	TC-99	N/A			6.2E-08	0.11%	0.06%	6.2E-08	0.11%	0.06%	2.7E-09	0.11%	0.02%	2.7E-09	0.11%	0.06%	N/A		
	U-234	N/A			1.9E-05	33.45%	17.55%	1.9E-05	33.45%	17.55%	8.1E-07	33.45%	5.38%	8.1E-07	33.45%	19.05%	N/A		
	U-235/236	N/A			1.0E-06	1.78%	0.94%	1.0E-06	1.78%	0.94%	4.3E-08	1.78%	0.29%	4.3E-08	1.78%	1.02%	N/A		
	U-238	N/A			3.6E-05	64.64%	33.91%	3.6E-05	64.64%	33.91%	1.6E-06	64.64%	10.39%	1.6E-06	64.64%	36.81%	N/A		
	Total Radiological Risk				5.6E-05	100.00%	52.46%	5.6E-05	100.00%	52.46%	2.4E-06	100.00%	16.08%	2.4E-06	100.00%	56.95%			

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TABLE B.3.2-34
(continued)

Medium	Parameter	On-Property Resident Farmer (RMP)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv esid. Use	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			N/A		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
Groundwater	NP-237	2.0E-07	0.02%	0.00%	1.2E-08	0.02%	0.00%	8.8E-09	0.02%	0.00%	N/A			N/A			N/A		
	SR-90	4.8E-08	0.00%	0.00%	2.9E-09	0.00%	0.00%	2.1E-09	0.00%	0.00%	N/A			N/A			N/A		
	TC-99	1.2E-07	0.01%	0.00%	7.0E-09	0.01%	0.00%	5.0E-09	0.01%	0.00%	N/A			N/A			N/A		
	U-234	3.7E-04	33.52%	1.09%	2.2E-05	33.52%	1.08%	1.6E-05	33.52%	0.17%	N/A			N/A			N/A		
	U-235/236	2.0E-05	1.79%	0.06%	1.2E-06	1.79%	0.06%	8.4E-07	1.79%	0.01%	N/A			N/A			N/A		
	U-238	7.1E-04	64.66%	2.11%	4.3E-05	64.66%	2.09%	3.0E-05	64.66%	0.33%	N/A			N/A			N/A		
	Total Radiological Risk	1.1E-03	100.00%	3.26%	6.6E-05	100.00%	3.23%	4.7E-05	100.00%	0.51%									

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TABLE B.3.2-34
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	3.8E-09	0.46%	0.00%	N/A			N/A			N/A			N/A			N/A		
	PU-238	1.0E-10	0.01%	0.00%	N/A			N/A			N/A			N/A			N/A		
	RA-226	9.3E-08	11.18%	0.07%	N/A			N/A			N/A			N/A			N/A		
	RA-228	1.5E-09	0.18%	0.00%	N/A			N/A			N/A			N/A			N/A		
	SR-90	9.1E-10	0.11%	0.00%	N/A			N/A			N/A			N/A			N/A		
	TC-99	4.7E-07	56.97%	0.34%	N/A			N/A			N/A			N/A			N/A		
	U-234	4.9E-08	5.88%	0.04%	N/A			N/A			N/A			N/A			N/A		
	U-235/236	4.3E-09	0.52%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-238	9.2E-08	11.09%	0.07%	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	7.2E-07	86.40%	0.52%															
	Arsenic	2.7E-08	3.30%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	4.1E-09	0.50%	0.00%	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	3.0E-08	3.56%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	5.0E-10	0.06%	0.00%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	1.2E-08	1.46%	0.01%	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	6.1E-09	0.73%	0.00%	N/A			N/A			N/A			N/A			N/A		
	Dieldrin	3.3E-08	4.00%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	1.1E-07	13.60%	0.08%															
	Total	8.3E-07	100.00%	0.60%															
GMR Surface Water	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		

TABLE B.3.2-34
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv esid. Use	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
GMR Surface Water	NP-237	N/A			N/A			N/A			1.0E-08	0.25%	0.25%	2.6E-10	0.41%	0.41%	N/A		
	PU-238	N/A			N/A			N/A			7.2E-10	0.02%	0.02%	7.1E-12	0.01%	0.01%	N/A		
	RA-226	N/A			N/A			N/A			1.3E-06	30.40%	30.40%	6.3E-09	10.10%	10.10%	N/A		
	RA-228	N/A			N/A			N/A			2.1E-08	0.49%	0.49%	1.0E-10	0.16%	0.16%	N/A		
	SR-90	N/A			N/A			N/A			7.6E-07	17.95%	17.95%	6.2E-09	9.94%	9.94%	N/A		
	TC-99	N/A			N/A			N/A			2.0E-06	46.33%	46.33%	3.2E-08	51.33%	51.33%	N/A		
	U-234	N/A			N/A			N/A			2.6E-08	0.63%	0.63%	3.3E-09	5.21%	5.21%	N/A		
	U-235/236	N/A			N/A			N/A			2.3E-09	0.05%	0.05%	2.9E-10	0.46%	0.46%	N/A		
	U-238	N/A			N/A			N/A			5.0E-08	1.19%	1.19%	6.2E-09	9.86%	9.86%	N/A		
	Total Radiological Risk										4.1E-06	97.31%	97.31%	5.5E-08	87.49%	87.49%			
	Arsenic	N/A			N/A			N/A			1.8E-10	0.00%	0.00%	1.0E-09	1.59%	1.59%	N/A		
	Beryllium	N/A			N/A			N/A			2.0E-11	0.00%	0.00%	5.1E-10	0.81%	0.81%	N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			4.1E-10	0.01%	0.01%	4.4E-10	0.71%	0.71%	N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			6.4E-08	1.51%	1.51%	3.2E-09	5.05%	5.05%	N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			1.1E-09	0.03%	0.03%	5.4E-11	0.09%	0.09%	N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			1.5E-14	0.00%	0.00%	2.6E-11	0.04%	0.04%	N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			4.8E-08	1.14%	1.14%	6.6E-10	1.04%	1.04%	N/A		
	Dieldrin	N/A			N/A			N/A			1.9E-12	0.00%	0.00%	2.0E-09	3.18%	3.18%	N/A		
	Total Chemical Risk										1.1E-07	2.69%	2.69%	7.9E-09	12.51%	12.51%			
	Total										4.2E-06	100.00%	100.00%	6.3E-08	100.00%	100.00%			

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TABLE B.3.2-34
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	CS-137	N/A			7.6E-10	0.02%	0.00%	2.0E-11	0.02%	0.00%	5.3E-11	0.01%	0.00%	1.3E-12	0.01%	0.00%	N/A		
	NP-237	N/A			1.8E-09	0.05%	0.00%	5.1E-11	0.06%	0.00%	1.3E-10	0.01%	0.00%	3.6E-12	0.01%	0.00%	N/A		
	PU-238	N/A			9.8E-10	0.03%	0.00%	2.8E-11	0.03%	0.00%	6.9E-11	0.01%	0.00%	1.9E-12	0.01%	0.00%	N/A		
	PU-239/240	N/A			6.7E-10	0.02%	0.00%	1.9E-11	0.02%	0.00%	4.7E-11	0.01%	0.00%	1.3E-12	0.01%	0.00%	N/A		
	RA-226	N/A			9.5E-07	25.79%	0.88%	9.1E-09	10.70%	0.88%	6.7E-08	7.11%	0.45%	1.1E-09	4.45%	0.03%	N/A		
	RA-228	N/A			1.5E-08	0.40%	0.01%	4.2E-10	0.49%	0.01%	1.0E-09	0.11%	0.01%	2.9E-11	0.12%	0.00%	N/A		
	SR-90	N/A			2.5E-09	0.07%	0.00%	6.8E-11	0.08%	0.00%	1.7E-10	0.02%	0.00%	4.7E-12	0.02%	0.00%	N/A		
	TC-99	N/A			7.4E-09	0.20%	0.01%	2.1E-10	0.25%	0.01%	5.3E-10	0.06%	0.00%	1.5E-11	0.06%	0.00%	N/A		
	TH-228	N/A			9.2E-09	0.25%	0.01%	2.6E-10	0.31%	0.01%	6.5E-10	0.07%	0.00%	1.8E-11	0.07%	0.00%	N/A		
	TH-230	N/A			7.0E-09	0.19%	0.01%	2.0E-10	0.23%	0.01%	5.0E-10	0.05%	0.00%	1.4E-11	0.06%	0.00%	N/A		
	TH-232	N/A			2.7E-08	0.72%	0.02%	7.4E-10	0.88%	0.02%	1.9E-09	0.20%	0.01%	5.2E-11	0.21%	0.00%	N/A		
	U-234	N/A			5.3E-09	0.14%	0.00%	1.5E-10	0.18%	0.00%	3.7E-10	0.04%	0.00%	1.1E-11	0.04%	0.00%	N/A		
	U-235/236	N/A			5.5E-10	0.01%	0.00%	1.5E-11	0.02%	0.00%	3.8E-11	0.00%	0.00%	1.1E-12	0.00%	0.00%	N/A		
	U-238	N/A			1.0E-08	0.27%	0.01%	2.8E-10	0.33%	0.01%	7.1E-10	0.07%	0.00%	2.0E-11	0.08%	0.00%	N/A		
	Total Radiological Risk				1.0E-06	28.18%	0.97%	1.2E-08	13.60%	0.97%	7.3E-08	7.77%	0.49%	1.3E-09	5.14%	0.49%			
	Aroclor-1254	N/A			5.6E-08	1.51%	0.05%	1.3E-09	1.58%	0.05%	1.8E-08	1.94%	0.12%	3.8E-10	1.53%	0.01%	N/A		
	Aroclor-1260	N/A			1.4E-08	0.39%	0.01%	3.7E-10	0.44%	0.01%	4.7E-09	0.50%	0.03%	1.1E-10	0.46%	0.00%	N/A		
	Arsenic	N/A			3.4E-07	9.13%	0.31%	9.1E-09	10.73%	0.31%	1.1E-07	11.74%	0.74%	2.9E-09	11.59%	0.07%	N/A		
	Benzo(a)anthracene	N/A			9.2E-08	2.51%	0.09%	2.6E-09	3.02%	0.09%	3.0E-08	3.22%	0.20%	8.3E-10	3.32%	0.02%	N/A		
	Benzo(a)pyrene	N/A			1.5E-06	41.53%	1.42%	4.3E-08	50.37%	1.42%	5.0E-07	53.32%	3.35%	1.4E-08	55.60%	0.33%	N/A		
	Benzo(b)fluoranthene	N/A			1.0E-07	2.72%	0.09%	2.8E-09	3.30%	0.09%	3.3E-08	3.49%	0.22%	9.2E-10	3.65%	0.02%	N/A		
	Benzo(k)fluoranthene	N/A			1.2E-08	0.33%	0.01%	3.3E-10	0.39%	0.01%	3.9E-09	0.42%	0.03%	1.1E-10	0.43%	0.00%	N/A		
	Beryllium	N/A			9.3E-08	2.53%	0.09%	2.6E-09	3.05%	0.09%	3.1E-08	3.26%	0.20%	8.4E-10	3.36%	0.02%	N/A		
	Dibenzo(a,h)anthracene	N/A			3.0E-07	8.24%	0.28%	8.5E-09	10.01%	0.28%	1.0E-07	10.58%	0.66%	2.8E-09	11.09%	0.07%	N/A		
	Dieldrin	N/A			1.2E-08	0.32%	0.01%	2.9E-10	0.34%	0.01%	3.9E-09	0.42%	0.03%	8.3E-11	0.33%	0.00%	N/A		
	Indeno(1,2,3-cd)pyrene	N/A			9.6E-08	2.60%	0.09%	2.7E-09	3.16%	0.09%	3.1E-08	3.34%	0.21%	8.8E-10	3.50%	0.02%	N/A		
	Total Chemical Risk				2.6E-06	71.82%	2.46%	7.3E-08	86.40%	2.46%	8.7E-07	92.23%	5.79%	2.4E-08	94.86%	0.56%			
	Total				3.7E-06	100.00%	3.43%	8.5E-08	100.00%	3.43%	9.4E-07	100.00%	6.28%	2.5E-08	100.00%	1.05%			
Homegrown Produce (Groundwater Affected)	NP-237	N/A			9.2E-10	0.01%	0.00%	9.2E-10	0.01%	0.00%	6.5E-11	0.01%	0.00%	6.5E-11	0.01%	0.00%	N/A		
	SR-90	N/A			1.4E-09	0.01%	0.00%	1.4E-09	0.01%	0.00%	9.7E-11	0.01%	0.00%	9.7E-11	0.01%	0.00%	N/A		
	TC-99	N/A			2.0E-08	0.12%	0.02%	2.0E-08	0.12%	0.02%	1.4E-09	0.12%	0.01%	1.4E-09	0.12%	0.03%	N/A		
	U-234	N/A			5.7E-06	33.45%	5.29%	5.7E-06	33.45%	5.29%	4.0E-07	33.45%	2.67%	4.0E-07	33.45%	9.45%	N/A		
	U-235/236	N/A			3.0E-07	1.78%	0.28%	3.0E-07	1.78%	0.28%	2.1E-08	1.78%	0.14%	2.1E-08	1.78%	0.50%	N/A		
	U-238	N/A			1.1E-05	64.63%	10.22%	1.1E-05	64.63%	10.22%	7.7E-07	64.63%	5.15%	7.7E-07	64.63%	18.26%	N/A		
	Total Radiological Risk				1.7E-05	100.00%	15.81%	1.7E-05	100.00%	15.81%	1.2E-06	100.00%	7.97%	1.2E-06	100.00%	28.25%			
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		

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TABLE B.3.2-34
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv esid. Use	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	CS-137	5.4E-07	0.04%	0.00%	3.0E-08	0.04%	0.00%	3.8E-08	0.01%	0.00%	N/A			N/A			N/A		
	NP-237	6.1E-07	0.04%	0.00%	3.3E-08	0.04%	0.00%	4.3E-08	0.01%	0.00%	N/A			N/A			N/A		
	PU-238	1.6E-09	0.00%	0.00%	8.9E-11	0.00%	0.00%	1.2E-10	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	1.1E-09	0.00%	0.00%	6.1E-11	0.00%	0.00%	8.2E-11	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	4.7E-05	3.16%	0.14%	2.6E-06	3.16%	0.13%	3.3E-06	0.88%	0.04%	N/A			N/A			N/A		
	RA-228	7.5E-07	0.05%	0.00%	4.1E-08	0.05%	0.00%	5.3E-08	0.01%	0.00%	N/A			N/A			N/A		
	SR-90	1.9E-05	1.26%	0.06%	1.0E-06	1.26%	0.05%	1.3E-06	0.35%	0.01%	N/A			N/A			N/A		
	TC-99	3.6E-04	24.21%	1.06%	2.0E-05	24.21%	0.96%	2.5E-05	6.72%	0.27%	N/A			N/A			N/A		
	TH-228	2.7E-08	0.00%	0.00%	1.5E-09	0.00%	0.00%	2.0E-09	0.00%	0.00%	N/A			N/A			N/A		
	TH-230	2.1E-08	0.00%	0.00%	1.1E-09	0.00%	0.00%	1.5E-09	0.00%	0.00%	N/A			N/A			N/A		
	TH-232	7.8E-08	0.01%	0.00%	4.3E-09	0.01%	0.00%	5.7E-09	0.00%	0.00%	N/A			N/A			N/A		
	U-234	7.2E-07	0.05%	0.00%	3.9E-08	0.05%	0.00%	5.0E-08	0.01%	0.00%	N/A			N/A			N/A		
	U-235/236	7.3E-08	0.00%	0.00%	4.0E-09	0.00%	0.00%	5.2E-09	0.00%	0.00%	N/A			N/A			N/A		
	U-238	1.3E-06	0.09%	0.00%	7.4E-08	0.09%	0.00%	9.5E-08	0.03%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	4.3E-04	28.91%	1.27%	2.3E-05	28.91%	1.15%	3.0E-05	8.02%	0.33%									
	Aroclor-1254	6.3E-06	0.43%	0.02%	3.4E-07	0.43%	0.02%	2.1E-06	0.55%	0.02%	N/A			N/A			N/A		
	Aroclor-1260	8.3E-07	0.06%	0.00%	4.6E-08	0.06%	0.00%	2.7E-07	0.07%	0.00%	N/A			N/A			N/A		
	Arsenic	5.5E-05	3.73%	0.16%	3.0E-06	3.73%	0.15%	1.8E-05	4.84%	0.20%	N/A			N/A			N/A		
	Benzo(a)anthracene	6.0E-05	4.06%	0.18%	3.3E-06	4.06%	0.16%	2.0E-05	5.25%	0.21%	N/A			N/A			N/A		
	Benzo(a)pyrene	5.7E-04	38.62%	1.70%	3.1E-05	38.62%	1.53%	1.9E-04	49.94%	2.02%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	3.7E-05	2.48%	0.11%	2.0E-06	2.48%	0.10%	1.2E-05	3.20%	0.13%	N/A			N/A			N/A		
	Benzo(k)fluoranthene	1.7E-06	0.11%	0.00%	9.1E-08	0.11%	0.00%	5.5E-07	0.15%	0.01%	N/A			N/A			N/A		
	Beryllium	4.4E-06	0.30%	0.01%	2.4E-07	0.30%	0.01%	1.4E-06	0.39%	0.02%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	4.3E-05	2.92%	0.13%	2.4E-06	2.92%	0.12%	1.4E-05	3.78%	0.15%	N/A			N/A			N/A		
	Dieldrin	2.5E-04	17.09%	0.75%	1.4E-05	17.09%	0.68%	8.3E-05	22.13%	0.90%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	1.9E-05	1.30%	0.06%	1.1E-06	1.30%	0.05%	6.3E-06	1.68%	0.07%	N/A			N/A			N/A		
	Total Chemical Risk	1.0E-03	71.09%	3.12%	5.8E-05	71.09%	2.82%	3.4E-04	91.98%	3.73%									
	Total	1.5E-03	100.00%	4.39%	8.1E-05	100.00%	3.97%	3.7E-04	100.00%	4.05%									
Homegrown Produce (Groundwater Affected)	NP-237	6.2E-08	0.02%	0.00%	3.4E-09	0.02%	0.00%	4.4E-09	0.02%	0.00%	N/A			N/A			N/A		
	SR-90	1.7E-08	0.01%	0.00%	9.1E-10	0.01%	0.00%	1.2E-09	0.01%	0.00%	N/A			N/A			N/A		
	TC-99	3.7E-08	0.01%	0.00%	2.0E-09	0.01%	0.00%	2.6E-09	0.01%	0.00%	N/A			N/A			N/A		
	U-234	1.1E-04	33.52%	0.33%	6.1E-06	33.52%	0.30%	7.8E-06	33.52%	0.08%	N/A			N/A			N/A		
	U-235/236	5.9E-06	1.79%	0.02%	3.2E-07	1.79%	0.02%	4.2E-07	1.79%	0.00%	N/A			N/A			N/A		
	U-238	2.1E-04	64.66%	0.64%	1.2E-05	64.66%	0.57%	1.5E-05	64.66%	0.16%	N/A			N/A			N/A		
	Total Radiological Risk	3.3E-04	100.00%	0.98%	1.8E-05	100.00%	0.89%	2.3E-05	100.00%	0.25%									
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			7.9E-11	0.42%	0.00%
	PU-238	N/A			N/A			N/A			N/A			N/A			2.2E-12	0.01%	0.00%
	RA-226	N/A			N/A			N/A			N/A			N/A			2.0E-09	10.54%	0.04%
	RA-228	N/A			N/A			N/A			N/A			N/A			3.1E-11	0.16%	0.00%
	SR-90	N/A			N/A			N/A			N/A			N/A			2.2E-09	11.51%	0.05%
	TC-99	N/A			N/A			N/A			N/A			N/A			1.0E-08	55.04%	0.23%
	U-234	N/A			N/A			N/A			N/A			N/A			9.9E-10	5.24%	0.02%
	U-235/236	N/A			N/A			N/A			N/A			N/A			8.6E-11	0.46%	0.00%
	U-238	N/A			N/A			N/A			N/A			N/A			1.9E-09	9.93%	0.04%
	Total Radiological Risk																1.8E-08	93.33%	0.40%
	Arsenic	N/A			N/A			N/A			N/A			N/A			3.9E-10	2.06%	0.01%
	Beryllium	N/A			N/A			N/A			N/A			N/A			8.3E-11	0.44%	0.00%
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			2.8E-11	0.15%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			2.0E-10	1.04%	0.00%
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			3.3E-12	0.02%	0.00%
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A			N/A			4.2E-12	0.02%	0.00%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			3.9E-11	0.21%	0.00%
	Dieldrin	N/A			N/A			N/A			N/A			N/A			5.1E-10	2.73%	0.01%
	Total Chemical Risk																1.3E-09	6.67%	0.03%
	Total																1.9E-08	100.00%	0.43%

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TABLE B.3.2-34
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Dust Affected)	CS-137	N/A			3.6E-09	0.02%	0.00%	4.4E-11	0.01%	0.00%	4.6E-10	0.00%	0.00%	5.7E-12	0.00%	0.00%	N/A		
	NP-237	N/A			8.3E-12	0.00%	0.00%	1.5E-13	0.00%	0.00%	6.3E-13	0.00%	0.00%	1.2E-14	0.00%	0.00%	N/A		
	PU-238	N/A			5.6E-14	0.00%	0.00%	1.2E-15	0.00%	0.00%	5.8E-15	0.00%	0.00%	1.3E-16	0.00%	0.00%	N/A		
	PU-239/240	N/A			4.1E-14	0.00%	0.00%	9.0E-16	0.00%	0.00%	4.3E-15	0.00%	0.00%	9.5E-17	0.00%	0.00%	N/A		
	RA-226	N/A			1.7E-07	0.96%	0.16%	2.9E-09	0.79%	0.16%	2.9E-08	0.30%	0.20%	5.1E-10	0.24%	0.01%	N/A		
	RA-228	N/A			1.7E-09	0.01%	0.00%	3.5E-11	0.01%	0.00%	3.0E-10	0.00%	0.00%	6.1E-12	0.00%	0.00%	N/A		
	SR-90	N/A			1.9E-09	0.01%	0.00%	1.7E-11	0.00%	0.00%	3.6E-10	0.00%	0.00%	3.2E-12	0.00%	0.00%	N/A		
	TC-99	N/A			2.7E-08	0.15%	0.02%	4.0E-10	0.11%	0.02%	4.4E-09	0.04%	0.03%	6.6E-11	0.03%	0.00%	N/A		
	TH-228	N/A			1.2E-11	0.00%	0.00%	2.6E-13	0.00%	0.00%	2.0E-12	0.00%	0.00%	4.1E-14	0.00%	0.00%	N/A		
	TH-230	N/A			4.5E-11	0.00%	0.00%	1.1E-12	0.00%	0.00%	7.0E-12	0.00%	0.00%	1.8E-13	0.00%	0.00%	N/A		
	TH-232	N/A			1.7E-10	0.00%	0.00%	4.2E-12	0.00%	0.00%	2.7E-11	0.00%	0.00%	6.7E-13	0.00%	0.00%	N/A		
	U-234	N/A			7.4E-10	0.00%	0.00%	1.5E-11	0.00%	0.00%	1.4E-10	0.00%	0.00%	2.8E-12	0.00%	0.00%	N/A		
	U-235/236	N/A			7.6E-11	0.00%	0.00%	1.6E-12	0.00%	0.00%	1.4E-11	0.00%	0.00%	2.9E-13	0.00%	0.00%	N/A		
	U-238	N/A			1.4E-09	0.01%	0.00%	2.9E-11	0.01%	0.00%	2.5E-10	0.00%	0.00%	5.3E-12	0.00%	0.00%	N/A		
	Total Radiological Risk				2.0E-07	1.17%	0.19%	3.4E-09	0.94%	0.19%	3.5E-08	0.36%	0.24%	6.0E-10	0.28%	0.01%			
	Aroclor-1254	N/A			3.7E-07	2.09%	0.34%	7.1E-09	1.93%	0.34%	2.1E-07	2.12%	1.40%	4.1E-09	1.94%	0.10%	N/A		
	Aroclor-1260	N/A			1.8E-06	10.52%	1.71%	4.4E-08	11.89%	1.71%	1.1E-06	10.64%	7.03%	2.5E-08	11.99%	0.59%	N/A		
	Arsenic	N/A			1.2E-07	0.67%	0.11%	1.3E-09	0.35%	0.11%	2.7E-08	0.28%	0.18%	3.0E-10	0.14%	0.01%	N/A		
	Benzo(a)anthracene	N/A			1.4E-07	0.78%	0.13%	2.8E-09	0.75%	0.13%	7.8E-08	0.79%	0.52%	1.6E-09	0.76%	0.04%	N/A		
	Benzo(a)pyrene	N/A			6.1E-06	35.18%	5.73%	1.3E-07	34.67%	5.73%	3.5E-06	35.65%	23.57%	7.3E-08	35.00%	1.73%	N/A		
	Benzo(b)fluoranthene	N/A			4.2E-07	2.38%	0.39%	8.6E-09	2.35%	0.39%	2.4E-07	2.42%	1.60%	5.0E-09	2.38%	0.12%	N/A		
	Benzo(k)fluoranthene	N/A			2.9E-07	1.67%	0.27%	6.2E-09	1.68%	0.27%	1.7E-07	1.69%	1.12%	3.6E-09	1.70%	0.08%	N/A		
	Beryllium	N/A			1.1E-08	0.06%	0.01%	1.9E-10	0.05%	0.01%	1.7E-09	0.02%	0.01%	2.9E-11	0.01%	0.00%	N/A		
	Dibenzo(a,h)anthracene	N/A			6.8E-06	38.84%	6.32%	1.4E-07	38.79%	6.32%	3.9E-06	39.33%	26.00%	8.2E-08	39.14%	1.94%	N/A		
	Dieldrin	N/A			6.5E-12	0.00%	0.00%	9.2E-14	0.00%	0.00%	3.7E-12	0.00%	0.00%	5.3E-14	0.00%	0.00%	N/A		
	Indeno(1,2,3-cd)pyrene	N/A			1.2E-06	6.63%	1.08%	2.4E-08	6.59%	1.08%	6.7E-07	6.72%	4.44%	1.4E-08	6.65%	0.33%	N/A		
	Total Chemical Risk				1.7E-05	98.83%	16.08%	3.6E-07	99.06%	16.08%	9.9E-06	99.64%	65.87%	2.1E-07	99.72%	4.93%			
	Total				1.7E-05	100.00%	16.27%	3.7E-07	100.00%	16.27%	9.9E-06	100.00%	66.11%	2.1E-07	100.00%	4.95%			
Beef/Milk (Groundwater Affected)	NP-237	N/A			2.8E-12	0.00%	0.00%	2.8E-12	0.00%	0.00%	2.2E-13	0.00%	0.00%	2.2E-13	0.00%	0.00%	N/A		
	SR-90	N/A			6.9E-10	0.04%	0.00%	6.9E-10	0.04%	0.00%	1.3E-10	0.04%	0.00%	1.3E-10	0.04%	0.00%	N/A		
	TC-99	N/A			4.8E-08	2.81%	0.04%	4.8E-08	2.81%	0.04%	7.9E-09	2.57%	0.05%	7.9E-09	2.57%	0.19%	N/A		
	U-234	N/A			5.5E-07	32.54%	0.52%	5.5E-07	32.54%	0.52%	1.0E-07	32.62%	0.67%	1.0E-07	32.62%	2.38%	N/A		
	U-235/236	N/A			2.9E-08	1.74%	0.03%	2.9E-08	1.74%	0.03%	5.4E-09	1.74%	0.04%	5.4E-09	1.74%	0.13%	N/A		
	U-238	N/A			1.1E-06	62.88%	1.00%	1.1E-06	62.88%	1.00%	1.9E-07	63.03%	1.30%	1.9E-07	63.03%	4.59%	N/A		
	Total Radiological Risk				1.7E-06	100.00%	1.58%	1.7E-06	100.00%	1.58%	3.1E-07	100.00%	2.06%	3.1E-07	100.00%	7.29%			

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TABLE B.3.2-34
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv esid. Use	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Dust Affected)	CS-137	5.5E-06	0.03%	0.02%	2.8E-07	0.03%	0.01%	7.0E-07	0.01%	0.01%	N/A			N/A			N/A		
	NP-237	3.6E-08	0.00%	0.00%	1.9E-09	0.00%	0.00%	2.7E-09	0.00%	0.00%	N/A			N/A			N/A		
	PU-238	2.2E-11	0.00%	0.00%	1.1E-12	0.00%	0.00%	2.3E-12	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	1.5E-11	0.00%	0.00%	7.8E-13	0.00%	0.00%	1.6E-12	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	1.1E-04	0.59%	0.34%	5.3E-06	0.56%	0.26%	2.0E-05	0.26%	0.21%	N/A			N/A			N/A		
	RA-228	1.8E-06	0.01%	0.01%	8.4E-08	0.01%	0.00%	3.2E-07	0.00%	0.00%	N/A			N/A			N/A		
	SR-90	8.3E-05	0.43%	0.25%	3.8E-06	0.40%	0.19%	1.6E-05	0.20%	0.17%	N/A			N/A			N/A		
	TC-99	7.8E-03	40.69%	23.28%	3.7E-04	39.12%	18.09%	1.3E-03	16.76%	14.04%	N/A			N/A			N/A		
	TH-228	6.2E-09	0.00%	0.00%	3.0E-10	0.00%	0.00%	9.8E-10	0.00%	0.00%	N/A			N/A			N/A		
	TH-230	4.7E-09	0.00%	0.00%	2.2E-10	0.00%	0.00%	7.3E-10	0.00%	0.00%	N/A			N/A			N/A		
	TH-232	1.8E-08	0.00%	0.00%	8.4E-10	0.00%	0.00%	2.8E-09	0.00%	0.00%	N/A			N/A			N/A		
	U-234	6.1E-07	0.00%	0.00%	2.8E-08	0.00%	0.00%	1.1E-07	0.00%	0.00%	N/A			N/A			N/A		
	U-235/236	6.3E-08	0.00%	0.00%	2.9E-09	0.00%	0.00%	1.1E-08	0.00%	0.00%	N/A			N/A			N/A		
	U-238	1.2E-06	0.01%	0.00%	5.3E-08	0.01%	0.00%	2.1E-07	0.00%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	8.0E-03	41.76%	23.89%	3.8E-04	40.13%	18.55%	1.3E-03	17.23%	14.44%									
	Aroclor-1254	4.9E-05	0.25%	0.14%	2.5E-06	0.26%	0.12%	2.8E-05	0.36%	0.30%	N/A			N/A			N/A		
	Aroclor-1260	2.1E-04	1.10%	0.63%	1.1E-05	1.13%	0.52%	1.2E-04	1.57%	1.31%	N/A			N/A			N/A		
	Arsenic	7.3E-05	0.38%	0.22%	4.1E-06	0.43%	0.20%	1.7E-05	0.22%	0.19%	N/A			N/A			N/A		
	Benzo(a)anthracene	1.6E-04	0.85%	0.49%	8.2E-06	0.87%	0.40%	9.4E-05	1.21%	1.02%	N/A			N/A			N/A		
	Benzo(a)pyrene	5.4E-03	28.07%	16.06%	2.7E-04	28.83%	13.33%	3.1E-03	40.07%	33.57%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	3.7E-04	1.91%	1.09%	1.9E-05	1.96%	0.91%	2.1E-04	2.73%	2.28%	N/A			N/A			N/A		
	Benzo(k)fluoranthene	1.5E-04	0.80%	0.46%	7.8E-06	0.82%	0.38%	8.9E-05	1.14%	0.96%	N/A			N/A			N/A		
	Beryllium	4.2E-06	0.02%	0.01%	2.4E-07	0.03%	0.01%	6.6E-07	0.01%	0.01%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	4.0E-03	20.80%	11.90%	2.0E-04	21.37%	9.88%	2.3E-03	29.68%	24.87%	N/A			N/A			N/A		
	Dieldrin	1.5E-07	0.00%	0.00%	7.5E-09	0.00%	0.00%	8.5E-08	0.00%	0.00%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	7.8E-04	4.05%	2.32%	3.9E-05	4.16%	1.92%	4.5E-04	5.78%	4.84%	N/A			N/A			N/A		
	Total Chemical Risk	1.1E-02	58.24%	33.31%	5.7E-04	59.87%	27.67%	6.4E-03	82.77%	69.35%									
	Total	1.9E-02	100.00%	57.20%	9.4E-04	100.00%	46.22%	7.8E-03	100.00%	83.79%									
Beef/Milk (Groundwater Affected)	NP-237	1.9E-10	0.00%	0.00%	1.0E-11	0.00%	0.00%	1.5E-11	0.00%	0.00%	N/A			N/A			N/A		
	SR-90	8.3E-09	0.03%	0.00%	3.8E-10	0.03%	0.00%	1.5E-09	0.03%	0.00%	N/A			N/A			N/A		
	TC-99	8.8E-08	0.27%	0.00%	4.2E-09	0.28%	0.00%	1.5E-08	0.25%	0.00%	N/A			N/A			N/A		
	U-234	1.1E-05	33.43%	0.03%	5.0E-07	33.43%	0.02%	2.0E-06	33.44%	0.02%	N/A			N/A			N/A		
	U-235/236	5.8E-07	1.78%	0.00%	2.6E-08	1.78%	0.00%	1.0E-07	1.78%	0.00%	N/A			N/A			N/A		
	U-238	2.1E-05	64.49%	0.06%	9.6E-07	64.48%	0.05%	3.8E-06	64.50%	0.04%	N/A			N/A			N/A		
	Total Radiological Risk	3.2E-05	100.00%	0.10%	1.5E-06	100.00%	0.07%	5.9E-06	100.00%	0.06%									

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TABLE B.3.2-34
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
Ambient Radon		1.9E-06		1.39%	4.4E-06		4.09%	4.4E-06		5.48%	7.9E-08		0.53%	7.9E-08		1.88%	N/A		
ALL MEDIA		1.4E-04			1.1E-04			*8.0E-05*			1.5E-05			4.2E-06			1.1E-05		

FER\CRU2RI\ABQ\SF_COC.XLS; 8/31/94; 5:26 PM

6507

TABLE B.3.2-34
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv esid. Use	% Total Medium Risk	% Total Receptor Risk	Great Miami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			1.8E-10	0.00%	0.00%
	PU-238	N/A			N/A			N/A			N/A			N/A			4.0E-14	0.00%	0.00%
	RA-226	N/A			N/A			N/A			N/A			N/A			2.4E-08	0.55%	0.55%
	RA-228	N/A			N/A			N/A			N/A			N/A			2.9E-10	0.01%	0.01%
	SR-90	N/A			N/A			N/A			N/A			N/A			5.2E-08	1.19%	1.18%
	TC-99	N/A			N/A			N/A			N/A			N/A			4.3E-06	97.73%	97.31%
	U-234	N/A			N/A			N/A			N/A			N/A			7.3E-09	0.17%	0.17%
	U-235/236	N/A			N/A			N/A			N/A			N/A			6.4E-10	0.01%	0.01%
	U-238	N/A			N/A			N/A			N/A			N/A			1.4E-08	0.32%	0.31%
	Total Radiological Risk																4.4E-06	99.97%	99.54%
	Arsenic	N/A			N/A			N/A			N/A			N/A			7.1E-11	0.00%	0.00%
	Beryllium	N/A			N/A			N/A			N/A			N/A			4.5E-12	0.00%	0.00%
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			2.7E-11	0.00%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			5.1E-10	0.01%	0.01%
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A			8.9E-12	0.00%	0.00%
	bis(2-Ethylhexyl)phthalate	N/A			N/A			N/A			N/A			N/A			6.1E-11	0.00%	0.00%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			5.7E-10	0.01%	0.01%
	Dieldrin	N/A			N/A			N/A			N/A			N/A			1.5E-13	0.00%	0.00%
	Total Chemical Risk																1.2E-09	0.03%	0.03%
	Total																4.4E-06	100.00%	99.57%
Ambient Radon		6.0E-05		0.18%	4.5E-06		0.22%	1.1E-06		0.01%	N/A			N/A			N/A		
ALL MEDIA		3.4E-02			2.0E-03			9.2E-03			4.2E-06			6.3E-08			4.4E-06		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

FER\CRU2RI\ABQ\SF_COC.XLS; 8/31/94; 5:26 PM

000299

AR - 6507

TABLE B.3.2-35
FUTURE LAND USE
SOUTH FIELD
SUMMARY OF NONCARCINOGENIC HAZARD

Medium	Parameter	Expanded Trespesser	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Farmer (Priv. Own)	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Farmer (Fed. Own.)	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Child (Priv. Own.)	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Child (Fed. Own.)	% of Total Medium Hazard	% of Total Receptor Hazard	Home-builder	% of Total Medium Hazard	% of Total Receptor Hazard
Surface Soil/ Air	Arsenic	1.3E-03	30.62%	1.61%	N/D			N/D			N/D			N/D			1.3E-01	24.92%	24.92%
	Beryllium	2.8E-03	65.07%	3.43%	N/D			N/D			N/D			N/D			1.2E-02	2.28%	2.28%
	Dieldrin	1.8E-04	4.31%	0.23%	N/D			N/D			N/D			N/D			1.8E-03	0.34%	0.34%
	Tributyl phosphate	N/A			N/A			N/A			N/A			N/A			6.6E-04	0.12%	0.12%
	U-Total	N/A			N/A			N/A			N/A			N/A			3.9E-01	72.34%	72.34%
	Total	4.2E-03	100.00%	5.27%													5.4E-01	100.00%	100.00%
Sediment	Arsenic	9.4E-04	19.07%	1.17%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	3.2E-03	65.08%	4.00%	N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	5.8E-04	11.82%	0.73%	N/A			N/A			N/A			N/A			N/A		
	Dieldrin	2.0E-04	4.03%	0.25%	N/A			N/A			N/A			N/A			N/A		
	Total	4.9E-03	100.00%	6.14%															
Groundwater	Tributyl phosphate	N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total	N/A			8.6E-01	100.00%	76.80%	8.6E-01	100.00%	76.86%	2.1E+00	100.00%	67.65%	2.1E+00	100.00%	67.72%	N/A		
	Total				8.6E-01	100.00%	76.80%	8.6E-01	100.00%	76.86%	2.1E+00	100.00%	67.65%	2.1E+00	100.00%	67.72%			
Surface Water	Arsenic	3.1E-04	0.43%	0.38%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	2.6E-05	0.04%	0.03%	N/A			N/A			N/A			N/A			N/A		
	Dieldrin	2.4E-04	0.34%	0.30%	N/A			N/A			N/A			N/A			N/A		
	U-Total	7.1E-02	99.19%	87.87%	N/A			N/A			N/A			N/A			N/A		
	Total	7.1E-02	100.00%	88.59%															
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A			N/A		
	Total	N/A																	
Homegrown Produce (Dust Affected)	Arsenic	N/A			6.4E-04	97.08%	0.06%	1.7E-05	98.00%	0.00%	2.5E-03	97.08%	0.08%	6.5E-05	98.75%	0.00%	N/A		
	Beryllium	N/A			4.3E-06	0.66%	0.00%	8.0E-08	0.45%	0.00%	1.7E-05	0.66%	0.00%	1.8E-07	0.28%	0.00%	N/A		
	Dieldrin	N/A			1.5E-05	2.26%	0.00%	2.7E-07	1.55%	0.00%	5.7E-05	2.26%	0.00%	6.4E-07	0.97%	0.00%	N/A		
	Total				6.6E-04	100.00%	0.06%	1.8E-05	100.00%	0.00%	2.5E-03	100.00%	0.08%	6.5E-05	100.00%	0.00%			
Homegrown Produce (H20 Affected)	Tributyl phosphate	N/A			*N/A*			*N/A*			*N/A*			*N/A*			*N/A*		
	U-Total	N/A			2.6E-01	100.00%	23.11%	2.6E-01	100.00%	23.13%	1.0E+00	100.00%	32.21%	1.0E+00	100.00%	32.25%	N/A		
	Total				2.6E-01	100.00%	23.11%	2.6E-01	100.00%	23.13%	1.0E+00	100.00%	32.21%	1.0E+00	100.00%	32.25%			
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Beef/Milk (Dust Affected)	Arsenic	N/A			2.2E-04	99.77%	0.02%	2.4E-06	99.64%	0.00%	6.1E-04	99.84%	0.02%	6.7E-06	99.75%	0.00%	N/A		
	Beryllium	N/A			5.0E-07	0.22%	0.00%	8.7E-09	0.36%	0.00%	9.1E-07	0.15%	0.00%	1.6E-08	0.24%	0.00%	N/A		
	Dieldrin	N/A			8.1E-09	0.00%	0.00%	1.1E-10	0.00%	0.00%	5.5E-08	0.01%	0.00%	7.7E-10	0.01%	0.00%	N/A		
	Total				2.2E-04	100.00%	0.02%	2.4E-06	100.00%	0.00%	6.1E-04	100.00%	0.02%	6.7E-06	100.00%	0.00%			
Beef/Milk (Groundwater Affected)	Tributyl phosphate	N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total	N/A			1.4E-04	100.00%	0.01%	1.4E-04	100.00%	0.01%	9.3E-04	100.00%	0.03%	9.3E-04	100.00%	0.03%	N/A		
	Total				1.4E-04	100.00%	0.01%	1.4E-04	100.00%	0.01%	9.3E-04	100.00%	0.03%	9.3E-04	100.00%	0.03%			
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
ALL MEDIA		8.0E-02			1.1E+00			1.1E+00			3.1E+00			3.1E+00			5.4E-01		

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000300

17-6507

TABLE B.3.2-35
FUTURE LAND USE
SOUTH FIELD
SUMMARY OF NONCARCINOGENIC HAZARD

Medium	Parameter		Expanded Trespasser	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Farmer (Priv. Own)	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Farmer (Fed. Own.)	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Child (Priv. Own.)	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Res. Child (Fed. Own.)	% of Total Medium Hazard	% of Total Receptor Hazard	Home-builder	% of Total Medium Hazard	% of Total Receptor Hazard
Surface Soil/ Air	Arsenic		1.3E-03	30.62%	1.61%	N/D			N/D			N/D			N/D			1.3E-01	24.92%	24.92%
	Beryllium		2.8E-03	65.07%	3.43%	N/D			N/D			N/D			N/D			1.2E-02	2.28%	2.28%
	Dieldrin		1.8E-04	4.31%	0.23%	N/D			N/D			N/D			N/D			1.8E-03	0.34%	0.34%
	Tributyl phosphate		N/A			N/A			N/A			N/A			N/A			6.6E-04	0.12%	0.12%
	U-Total		N/A			N/A			N/A			N/A			N/A			3.9E-01	72.34%	72.34%
		Total	4.2E-03	100.00%	5.27%													5.4E-01	100.00%	100.00%
Sediment	Arsenic		9.4E-04	19.07%	1.17%	N/A			N/A			N/A			N/A			N/A		
	Beryllium		3.2E-03	65.08%	4.00%	N/A			N/A			N/A			N/A			N/A		
	U-TOTAL		5.8E-04	11.82%	0.73%	N/A			N/A			N/A			N/A			N/A		
	Dieldrin		2.0E-04	4.03%	0.25%	N/A			N/A			N/A			N/A			N/A		
		Total	4.9E-03	100.00%	6.14%															
Groundwater	Tributyl phosphate		N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total		N/A			8.6E-01	100.00%	76.80%	8.6E-01	100.00%	76.86%	2.1E+00	100.00%	67.65%	2.1E+00	100.00%	67.72%	N/A		
		Total				8.6E-01	100.00%	76.80%	8.6E-01	100.00%	76.86%	2.1E+00	100.00%	67.65%	2.1E+00	100.00%	67.72%			
Surface Water	Arsenic		3.1E-04	0.43%	0.38%	N/A			N/A			N/A			N/A			N/A		
	Beryllium		2.6E-05	0.04%	0.03%	N/A			N/A			N/A			N/A			N/A		
	Dieldrin		2.4E-04	0.34%	0.30%	N/A			N/A			N/A			N/A			N/A		
	U-Total		7.1E-02	99.19%	87.87%	N/A			N/A			N/A			N/A			N/A		
		Total	7.1E-02	100.00%	88.59%															
GMR Surface Water	Arsenic		N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium		N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin		N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL		N/A			N/A			N/A			N/A			N/A			N/A		
		Total	N/A																	
Homegrown Produce (Dust Affected)	Arsenic		N/A			6.4E-04	97.08%	0.06%	1.7E-05	98.00%	0.00%	2.5E-03	97.08%	0.08%	6.5E-05	98.75%	0.00%	N/A		
	Beryllium		N/A			4.3E-06	0.66%	0.00%	8.0E-08	0.45%	0.00%	1.7E-05	0.66%	0.00%	1.8E-07	0.28%	0.00%	N/A		
	Dieldrin		N/A			1.5E-05	2.26%	0.00%	2.7E-07	1.55%	0.00%	5.7E-05	2.26%	0.00%	6.4E-07	0.97%	0.00%	N/A		
		Total				6.6E-04	100.00%	0.06%	1.8E-05	100.00%	0.00%	2.5E-03	100.00%	0.08%	6.5E-05	100.00%	0.00%			
Homegrown Produce (H20 Affected)	Tributyl phosphate		N/A			*N/A*			*N/A*			*N/A*			*N/A*			*N/A*		
	U-Total		N/A			2.6E-01	100.00%	23.11%	2.6E-01	100.00%	23.13%	1.0E+00	100.00%	32.21%	1.0E+00	100.00%	32.25%	N/A		
		Total				2.6E-01	100.00%	23.11%	2.6E-01	100.00%	23.13%	1.0E+00	100.00%	32.21%	1.0E+00	100.00%	32.25%			
Homegrown Produce (GMR Surface Water Affected)	Arsenic		N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium		N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin		N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL		N/A			N/A			N/A			N/A			N/A			N/A		
		Total																		
Beef/Milk (Dust Affected)	Arsenic		N/A			2.2E-04	99.77%	0.02%	2.4E-06	99.64%	0.00%	6.1E-04	99.84%	0.02%	6.7E-06	99.75%	0.00%	N/A		
	Beryllium		N/A			5.0E-07	0.22%	0.00%	8.7E-09	0.36%	0.00%	9.1E-07	0.15%	0.00%	1.6E-08	0.24%	0.00%	N/A		
	Dieldrin		N/A			8.1E-09	0.00%	0.00%	1.1E-10	0.00%	0.00%	5.5E-08	0.01%	0.00%	7.7E-10	0.01%	0.00%	N/A		
		Total				2.2E-04	100.00%	0.02%	2.4E-06	100.00%	0.00%	6.1E-04	100.00%	0.02%	6.7E-06	100.00%	0.00%			
Beef/Milk (Groundwater Affected)	Tributyl phosphate		N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total		N/A			1.4E-04	100.00%	0.01%	1.4E-04	100.00%	0.01%	9.3E-04	100.00%	0.03%	9.3E-04	100.00%	0.03%	N/A		
		Total				1.4E-04	100.00%	0.01%	1.4E-04	100.00%	0.01%	9.3E-04	100.00%	0.03%	9.3E-04	100.00%	0.03%			
Beef/Milk (GMR Surface Water Affected)	Arsenic		N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium		N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin		N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL		N/A			N/A			N/A			N/A			N/A			N/A		
		Total																		
ALL MEDIA				8.0E-02		1.1E+00			1.1E+00			3.1E+00			3.1E+00			5.4E-01		

FER\CRU2RI\ABQ\SF_COCN.XLS; 8/31/94; 5:49 PM

000201

TABLE B.3.2-35
(continued)

Medium	Parameter		On-Property Resident Farmer (RME)	% of Total Medium Hazard	% of Total Receptor Hazard	On-Property Resident Farmer (CT)	% of Total Medium Hazard	% of Total Receptor Hazard	On-Property Resident Child	% of Total Medium Hazard	% of Total Receptor Hazard	Great Miami Riv. Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Resid. Use	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/ Air	Arsenic		6.2E-02	78.67%	0.26%	2.2E-02	91.10%	0.21%	3.1E-01	91.10%	0.50%	N/A			N/A			N/A		
	Beryllium		1.5E-02	19.50%	0.07%	1.9E-03	7.71%	0.02%	2.6E-02	7.71%	0.04%	N/A			N/A			N/A		
	Dieldrin		1.4E-03	1.83%	0.01%	2.9E-04	1.19%	0.00%	4.1E-03	1.19%	0.01%	N/A			N/A			N/A		
		Total	7.8E-02	100.00%	0.33%	2.5E-02	100.00%	0.23%	3.4E-01	100.00%	0.55%									
Sediment	Arsenic		N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium		N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL		N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin		N/A			N/A			N/A			N/A			N/A			N/A		
		Total																		
Groundwater	Tributyl phosphate		8.6E-03	0.05%	0.04%	4.0E-03	0.05%	0.04%	2.0E-02	0.05%	0.03%	N/A			N/A			N/A		
	U-Total		1.8E+01	99.95%	75.66%	8.2E+00	99.95%	77.19%	4.1E+01	99.95%	65.14%	N/A			N/A			N/A		
		Total	1.8E+01	100.00%	75.70%	8.3E+00	100.00%	77.23%	4.1E+01	100.00%	65.17%									
Surface Water	Arsenic		N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium		N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin		N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total		N/A			N/A			N/A			N/A			N/A			N/A		
		Total	N/A			N/A			N/A			N/A			N/A			N/A		
GMR Surface Water	Arsenic		N/A			N/A			N/A			7.9E-07	31.81%	31.81%	1.9E-06	1.39%	1.39%	N/A		
	Beryllium		N/A			N/A			N/A			2.8E-09	0.11%	0.11%	1.5E-08	0.01%	0.01%	N/A		
	Dieldrin		N/A			N/A			N/A			5.7E-09	0.23%	0.23%	5.4E-07	0.40%	0.40%	N/A		
	U-TOTAL		N/A			N/A			N/A			1.7E-06	67.85%	67.85%	1.3E-04	98.20%	98.20%	N/A		
		Total	N/A			N/A			N/A			*2.5E-06*	100.00%	100.00%	*1.4E-04*	100.00%	100.00%	N/A		
Homegrown Produce (Dust Affected)	Arsenic		1.0E-01	24.96%	0.45%	4.5E-02	24.96%	0.42%	4.0E-01	24.97%	0.64%	N/A			N/A			N/A		
	Beryllium		2.0E-04	0.05%	0.00%	8.7E-05	0.05%	0.00%	7.9E-04	0.05%	0.00%	N/A			N/A			N/A		
	Dieldrin		3.2E-01	74.99%	1.34%	1.3E-01	74.99%	1.26%	1.2E+00	74.98%	1.93%	N/A			N/A			N/A		
		Total	4.2E-01	100.00%	1.79%	1.8E-01	100.00%	1.68%	1.6E+00	100.00%	2.58%									
Homegrown Produce (H20 Affected)	Tributyl phosphate		2.5E-03	0.05%	0.01%	1.1E-03	0.05%	0.01%	9.6E-03	0.05%	0.02%	N/A			N/A			N/A		
	U-Total		5.1E+00	99.95%	21.53%	2.2E+00	99.95%	20.24%	1.9E+01	99.95%	31.02%	N/A			N/A			N/A		
		Total	5.1E+00	100.00%	21.54%	2.2E+00	100.00%	20.25%	1.9E+01	100.00%	31.03%									
Homegrown Produce (GMR Surface Water Affected)	Arsenic		N/A			N/A			N/A			N/A			N/A			7.4E-07	1.86%	1.86%
	Beryllium		N/A			N/A			N/A			N/A			N/A			3.9E-09	0.01%	0.01%
	Dieldrin		N/A			N/A			N/A			N/A			N/A			6.4E-07	1.62%	1.61%
	U-TOTAL																	3.8E-05	96.51%	96.13%
		Total																4.0E-05	100.00%	99.61%
Beef/Milk (Dust Affected)	Aroclor-1254		1.4E-01	99.73%	0.59%	6.1E-02	99.74%	0.57%	3.8E-01	99.58%	0.61%	N/A			N/A			N/A		
	Aroclor-1260		1.9E-04	0.14%	0.00%	8.7E-05	0.14%	0.00%	3.6E-04	0.09%	0.00%	N/A			N/A			N/A		
	Arsenic		1.9E-04	0.13%	0.00%	7.3E-05	0.12%	0.00%	1.2E-03	0.32%	0.00%	N/A			N/A			N/A		
		Total	1.4E-01	100.00%	0.60%	6.1E-02	100.00%	0.57%	3.8E-01	100.00%	0.61%									
Beef/Milk (Groundwater Affected)	Tributyl phosphate		7.6E-03	74.08%	0.03%	3.4E-03	76.28%	0.03%	1.7E-02	48.52%	0.03%	N/A			N/A			N/A		
	U-Total		2.7E-03	25.92%	0.01%	1.0E-03	23.72%	0.01%	1.8E-02	51.48%	0.03%	N/A			N/A			N/A		
		Total	1.0E-02	100.00%	0.04%	4.4E-03	100.00%	0.04%	3.5E-02	100.00%	0.06%									
Beef/Milk (GMR Surface Water Affected)	Arsenic		N/A			N/A						N/A			N/A			1.4E-07	86.81%	0.34%
	Beryllium		N/A			N/A						N/A			N/A			2.1E-10	0.13%	0.00%
	Dieldrin		N/A			N/A						N/A			N/A			1.9E-10	0.12%	0.00%
	U-TOTAL																	2.0E-08	12.94%	0.05%
		Total																1.6E-07	100.00%	0.39%
ALL MEDIA			2.3E+01			1.1E+01			6.3E+01			2.5E-06			1.4E-04			4.0E-05		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D signifies the hazard was not calculated because toxicity data are not available.

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TABLE B.3.2-35
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Hazard	% of Total Receptor Hazard	On-Property Resident Farmer (CT)	% of Total Medium Hazard	% of Total Receptor Hazard	On-Property Resident Child	% of Total Medium Hazard	% of Total Receptor Hazard	Great Miami Riv. Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Resid. Use	% Total Medium Hazard	% Total Receptor Hazard	Great Miami Riv. Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/ Air	Arsenic	6.2E-02	78.67%	0.26%	2.2E-02	91.10%	0.21%	3.1E-01	91.10%	0.50%	N/A			N/A			N/A		
	Beryllium	1.5E-02	19.50%	0.07%	1.9E-03	7.71%	0.02%	2.6E-02	7.71%	0.04%	N/A			N/A			N/A		
	Dieldrin	1.4E-03	1.83%	0.01%	2.9E-04	1.19%	0.00%	4.1E-03	1.19%	0.01%	N/A			N/A			N/A		
	Total	7.8E-02	100.00%	0.33%	2.5E-02	100.00%	0.23%	3.4E-01	100.00%	0.55%									
Sediment	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Groundwater	Tributyl phosphate	8.6E-03	0.05%	0.04%	4.0E-03	0.05%	0.04%	2.0E-02	0.05%	0.03%	N/A			N/A			N/A		
	U-Total	1.8E+01	99.95%	75.66%	8.2E+00	99.95%	77.19%	4.1E+01	99.95%	65.14%	N/A			N/A			N/A		
	Total	1.8E+01	100.00%	75.70%	8.3E+00	100.00%	77.23%	4.1E+01	100.00%	65.17%									
Surface Water	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dieldrin	N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total	N/A			N/A			N/A			N/A			N/A			N/A		
	Total	N/A			N/A			N/A			N/A			N/A			N/A		
GMR Surface Water	Arsenic	N/A			N/A			N/A			7.9E-07	31.81%	31.81%	1.9E-06	1.39%	1.39%	N/A		
	Beryllium	N/A			N/A			N/A			2.8E-09	0.11%	0.11%	1.5E-08	0.01%	0.01%	N/A		
	Dieldrin	N/A			N/A			N/A			5.7E-09	0.23%	0.23%	5.4E-07	0.40%	0.40%	N/A		
	U-TOTAL	N/A			N/A			N/A			1.7E-06	67.85%	67.85%	1.3E-04	98.20%	98.20%	N/A		
	Total	N/A			N/A			N/A			***2.5E-06***	100.00%	100.00%	***1.4E-04***	100.00%	100.00%	N/A		
Homegrown Produce (Dust Affected)	Arsenic	1.0E-01	24.96%	0.45%	4.5E-02	24.96%	0.42%	4.0E-01	24.97%	0.64%	N/A			N/A			N/A		
	Beryllium	2.0E-04	0.05%	0.00%	8.7E-05	0.05%	0.00%	7.9E-04	0.05%	0.00%	N/A			N/A			N/A		
	Dieldrin	3.2E-01	74.99%	1.34%	1.3E-01	74.99%	1.26%	1.2E+00	74.98%	1.93%	N/A			N/A			N/A		
	Total	4.2E-01	100.00%	1.79%	1.8E-01	100.00%	1.68%	1.6E+00	100.00%	2.58%									
Homegrown Produce (H20 Affected)	Tributyl phosphate	2.5E-03	0.05%	0.01%	1.1E-03	0.05%	0.01%	9.6E-03	0.05%	0.02%	N/A			N/A			N/A		
	U-Total	5.1E+00	99.95%	21.53%	2.2E+00	99.95%	20.24%	1.9E+01	99.95%	31.02%	N/A			N/A			N/A		
	Total	5.1E+00	100.00%	21.54%	2.2E+00	100.00%	20.25%	1.9E+01	100.00%	31.03%									
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A			7.4E-07	1.86%	1.86%
	Beryllium	N/A			N/A			N/A			N/A			N/A			3.9E-09	0.01%	0.01%
	Dieldrin	N/A			N/A			N/A			N/A			N/A			6.4E-07	1.62%	1.61%
	U-TOTAL																3.8E-05	96.51%	96.13%
	Total																4.0E-05	100.00%	99.61%
Beef/Milk (Dust Affected)	Aroclor-1254	1.4E-01	99.73%	0.59%	6.1E-02	99.74%	0.57%	3.8E-01	99.58%	0.61%	N/A			N/A			N/A		
	Aroclor-1260	1.9E-04	0.14%	0.00%	8.7E-05	0.14%	0.00%	3.6E-04	0.09%	0.00%	N/A			N/A			N/A		
	Arsenic	1.9E-04	0.13%	0.00%	7.3E-05	0.12%	0.00%	1.2E-03	0.32%	0.00%	N/A			N/A			N/A		
	Total	1.4E-01	100.00%	0.60%	6.1E-02	100.00%	0.57%	3.8E-01	100.00%	0.61%									
Beef/Milk (Groundwater Affected)	Tributyl phosphate	7.6E-03	74.08%	0.03%	3.4E-03	76.28%	0.03%	1.7E-02	48.52%	0.03%	N/A			N/A			N/A		
	U-Total	2.7E-03	25.92%	0.01%	1.0E-03	23.72%	0.01%	1.8E-02	51.48%	0.03%	N/A			N/A			N/A		
	Total	1.0E-02	100.00%	0.04%	4.4E-03	100.00%	0.04%	3.5E-02	100.00%	0.06%									
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A						N/A			N/A			1.4E-07	86.81%	0.34%
	Beryllium	N/A			N/A						N/A			N/A			2.1E-10	0.13%	0.00%
	Dieldrin	N/A			N/A						N/A			N/A			1.9E-10	0.12%	0.00%
	U-TOTAL																2.0E-08	12.94%	0.05%
	Total																1.6E-07	100.00%	0.39%
ALL MEDIA		2.3E+01			1.1E+01			6.3E+01			2.5E-06			1.4E-04			4.0E-05		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D signifies the hazard was not calculated because toxicity data are not available.

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000303

the primary contributors to total receptor risk were uranium-234 and uranium-238 in groundwater which contributed 56 percent. Total hazards for both the off-property receptors exceeded 1.0.

Risks to the expanded trespasser and homebuilder were 1.4×10^{-4} and 1.1×10^{-5}, respectively. The greatest contribution of risk to the expanded trespasser was from radium-226 (8.3×10^{-5}), radium-228 5.0×10^{-6}), thorium-228 (1.1×10^{-5}), and thorium-232 (1.5×10^{-5}) in surface soil via external radiation which accounted for 82 percent of the total receptor risk. The major contributors to risk to the homebuilder were from radium-226 (2.6×10^{-6}), thorium-228 (1.6×10^{-6}), thorium-232 (2.1×10^{-6}) in surface soil via external radiation, and arsenic (1.1×10^{-6}) in surface soil via dermal contact which accounted for approximately 51 percent of the total receptor risk.

Total estimated risk to the Great Miami River youth user was 6.3×10^{-5} also due mostly to benzo(a)pyrene in surface water which accounted for 41 percent of total risk to this receptor. Beryllium contributed another 12 percent to total risk to this receptor. Total HI for this receptor was less than 1.0.

For the users of the Great Miami River, the total risk calculated for the recreational user was 4.2×10^{-6} with the risk due primarily to ingestion of fish contaminated with radium-226 (1.3×10^{-6}) and technetium-99 (2.0×10^{-6}) via the Great Miami River surface water pathway. For the Great Miami River agricultural user, total risk was 4.4×10^{-6} due primarily to the ingestion of beef and milk products affected by dust containing technetium-99 which accounts for 97 percent of the total receptor risk. Total receptor risk to the residential user was 6.3×10^{-8}. Total HIs for all of the Great Miami River user were below 1.0.

B.3.3 INACTIVE FLYASH PILE

B.3.3.1 Exposure Point Concentrations

Table B.3.3-1 summarizes the exposure scenarios evaluated to assess risk associated with the Inactive Flyash Pile. It also summarizes derivation of exposure concentrations specific to this subunit. Exposure point concentrations for surface soil were derived from analytical data on samples collected within the boundaries of the Inactive Flyash Pile. Other exposure point concentrations were derived using modeled data. Section 5 of the RI report and Appendix A present detailed discussions of the modeling.

TABLE B.3.3-1

INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS FOR SCENARIOS EVALUATED

Current Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current Access Controls (current use of FEMP continues, DOE ownership)	Trespassing Youth	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
		air	inhalation of particulates, radionuclides, volatiles, and gases	maximum estimated on-subunit current concentrations derived from airborne soil air modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	incidental ingestion dermal contact external radiation	sediment within subunit
	Off-Property Resident Farmer (adult and child), homegrown produce off-property, livestock grazing off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property current concentrations derived from airborne soil air modeling concentrations
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property current concentrations derived from deposited airborne soil air modeling results
		livestock (grazing off-property)	ingestion of milk and beef	maximum estimated off-property current concentrations derived from deposited airborne soil air modeling results
	Groundskeeper	air	inhalation of particulates, volatiles, and gases	maximum estimated on-subunit current concentration derived from air modeling
		surface soil	ingestion dermal contact external radiation	surface soil within subunit

0000105

TABLE B.3.3-1
(Continued)

Current Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current with Access Controls (current use of FEMP continues, DOE ownership) (continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miam River)	ingestion of fruit and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Household User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Current without Access Controls (current use of FEMP continues)	User of Meat and Milk Products		livestock (grazing on-property)	ingestion of milk and beef	maximum estimated on-property current concentrations derived from deposited IFP surface soil air modeling results

000306

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TABLE B.3.3-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne soil air modeling results
		plants (homegrown produce)	ingestion	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations off-site at time when concentration is greatest (South Field and Inactive Flyash Pile combined)
	Expanded Trespasser (youth)	air	inhalation of particulates, radionuclides, volatiles, and gases	maximum estimated on-subunit airborne soil modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	ingestion dermal contact external radiation	sediment within subunit
		surface soil	ingestion dermal contact external radiation	surface soil within subunit

007007

TABLE B.3.3-1
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership (Continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruits and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Residential User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Without Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property		air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne soil air modeling results
			plants (homegrown produce)	ingestion	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
			livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
			groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations off-site at time when concentration is greatest (South Field and Inactive Flyash Pile combined)

0003008

1650

TABLE B.3.3-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future On-Property Resident Farmer (adult and child) located adjacent to subunit, homegrown produce on-property, livestock grazing on-property, groundwater on-property, RME and CT estimates.	air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-property future concentrations from airborne soil modeling results
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		groundwater	incidental ingestion dermal contact inhalation	modeled groundwater concentrations underlying Inactive Flyash Pile at time when concentration is greatest (South Field and Inactive Flyash Pile combined)

000309

TABLE B.3.3-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future On-Property Resident Farmer (adult and child) located adjacent to subunit, homegrown produce on-property, livestock grazing on-property, groundwater on-property, RME and CT estimates (continued)	surface soil	incidental ingestion dermal contact external radiation	not quantified; farmer is living and farming adjacent to subunit and therefore, not in direct contact with surface soil
	Future Homebuilder	waste material/subsurface soil	external radiation incidental ingestion dermal contact	not quantified; no building on Inactive Flyash Pile anticipated
		air	inhalation of particulates, volatiles, and gases	not quantified, no building on the Inactive Flyash Pile anticipated
	Future Perched Groundwater User, homegrown produce on-subunit, livestock grazing on-subunit, groundwater on-property (Solid Waste Landfill and Lime Sludge Ponds only)	air	inhalation particulates, volatiles, gases, and indoor radon	not quantified; no perched groundwater user was evaluated for the Inactive Flyash Pile because no useable perched water from the Inactive Flyash Pile is available.
		plants (home grown produce)	ingestion of fruits and vegetables	not quantified; no perched groundwater user was evaluated for the Inactive Flyash Pile because no useable perched water from the Inactive Flyash Pile is available.
		livestock (grazing on property)	ingestion of milk and beef	not quantified; no perched groundwater user was evaluated for the Inactive Flyash Pile because no useable perched water from the Inactive Flyash Pile is available.
		perched groundwater directly underlying subunit	ingestion, dermal contact, and inhalation of volatiles released during household use	not quantified; no useable perched groundwater at Inactive Flyash Pile
		soil	incidental ingestion dermal contact external radiation	not quantified; no perched groundwater user was evaluated for the Inactive Flyash Pile because no useable perched water from the Inactive Flyash Pile is available.

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For groundwater exposures, data from the Inactive Flyash Pile and the South Field were combined to develop source terms for estimating future groundwater concentrations as described in Section 5.0 of this RI report. Exposure point concentrations related to air dispersion modeling are also described in Section 5.0. For this subunit, under future land use it was assumed that the on-property farmer resided adjacent to the Inactive Flyash Pile and simultaneously farmed that area. The farmer was placed adjacent to the Inactive Flyash Pile because the subunit is considered insufficiently stable to support a farm house or agricultural activities.

B.3.3.2 Constituents of Potential Concern

The CPCs identified for surface soil, subsurface soil, and seeps in the Inactive Flyash Pile are summarized in Tables B.3.3-2(a), (b), (c), respectively (Attachment B.III) along with relevant information regarding frequencies of detection, data distribution, 95 percent UCLs, etc. Additionally, CPCs quantified for Inactive Flyash Pile perched water are summarized in Table B.3.1-2(c) in Attachment B.III. Table B.3.3-3 summarized CPCs for the Inactive Flyash Pile by medium.

B.3.3.3 Risk Characterization for Current Land Use

The scenarios characterized for the Inactive Flyash Pile assuming continued DOE ownership with access controls are a trespassing youth; an off-property farmer and resident child using food products from livestock grazing off-property and produce grown off-property; an on-property groundskeeper exposed to on-site contaminant concentrations; and a Great Miami River recreational user, a Great Miami River agricultural user, and a Great Miami River residential user. In the event that the FEMP lost access, a user of meat and milk products from livestock grazing on-property was also evaluated.

B.3.3.3.1 Trespassing Youth

Risk was characterized for a trespassing youth contacting CPCs via ingestion of and dermal contact with surface soil within the subunit; external radiation resulting from exposure to surface soil within the subunit; inhalation of particulates; and ingestion and dermal contact with surface water and sediment within the subunit. Exposure point concentrations for surface soil were based on analytical data, while inhaled particulate concentrations and surface water and sediment concentrations were based on air modeling results as described in the Section B.2.0, Appendix A, and Section 5.0 of this RI report.

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TABLE B.3.3-3

INACTIVE FLYASH PILE
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Groundwater (GMA)
arsenic	arsenic	arsenic	plutonium-239/240	neptunium-237
beryllium	beryllium	berylium	strontium-90	radium-226
lead	lead	cadmium	uranium-234	strontium-90
neptunium-237	cesium-137	lead	uranium-235/236	technetium-99
plutonium-238	neptunium-237	nickel	uranium-238	uranium-234
plutonium-239/240	lead-210	neptunium-237	uranium-total	uranium-235/236
radium-226	plutonium-238	plutonium-238	arsenic	uranium-238
radium-228	plutonium-239/240	plutonium-239/240	berylium	uranium-total
strontium-90	radium-224	radium-226	dibenzo(a,h)anthracene	lead
thorium-228	radium-226	radium-228	neptunium-237	arsenic
thorium-230	radium-228	strontium-90	plutonium-238	2-methylnaphthalene
thorium-232	ruthenium-106	uranium-234	radium-226	benzo(g,h,i)perylene
thorium-total	thorium-228	uranium-235/236	radium-228	phenanthrene
uranium-234	thorium-230	uranium-238		tributyl phosphate
uranium-235/236	thorium-232	uranium-total		
uranium-238	thorium-total	2-methylnaphthalene		
2-methylnaphthalene	uranium-234			
dibenzo(a,h)anthracene	uranium-235			
	uranium-235/236			
	uranium-238			
	uranium-total			
	2-methylnaphthalene			
	benzo(a)anthracene			
	benzo(a)pyrene			
	benzo(b)fluoranthene			
	benzo(g,h,i)perylene			
	phenanthrene			
	tributyl phosphate			
	octachlorodibenzo-p-dioxin			
	tetrachlorodibenzofuran			
	Aroclor-1254			
	Aroclor-1260			
	dieldrin			

Risks and hazards calculated for the trespassing youth exposed to contaminants in surface soil on the Inactive Flyash Pile are presented in Table B.3.3-4 (Attachment B.III). The total risk due to exposure to all CPCs in surface soil was 1.3×10^{-5}. This was primarily due to external radiation from radium-226 (2.5×10^{-6}), radium-228 (1.4×10^{-6}), thorium-228 (3.2×10^{-6}) and thorium-232 (4.2×10^{-6}). Risks and hazards calculated for the trespassing youth exposed to contaminants in sediment are presented in Table B.3.3-5(a) (Attachment B.III). Total risk from sediments was 2.1×10^{-6} due to the cumulative risk of all CPCs present. The risks and hazards calculated for the trespassing youth exposed to contaminants in surface water are presented in Table B.3.3-5(b) (Attachment B.III). All risks were below 1.0×10^{-6}. Total HIs calculated for exposure of a trespassing youth to CPCs in soil, sediment, or surface water did not exceed 1.0.

B.3.3.3.2 Current Off-Property Farmers

Risk was characterized for the off-property farmer and resident child contacting CPCs via inhalation of airborne particulates and ingestion of airborne particulates deposited on homegrown produce or in milk or beef from livestock grazing on particulates deposited on off-site vegetation. For these routes of exposure, the exposure point concentrations were derived from air modeling results as described in Section B.2.0, Methodology, and Appendix A, and Section 5.0 of the RI report.

The risks and hazards calculated for the current off-property farmer and resident child exposed to CPCs in soil are presented in Tables B.3.3-6(a) and B.3.3-6(b), respectively (Attachment B.III). The total risk associated with inhalation of all CPCs in airborne soil particulates was 6.5×10^{-8} and 2.0×10^{-9}, respectively. Total HIs calculated for CPCs in surface soil were below 1.0 for both the farmer and resident child.

Risks and hazards calculated for the off-property farmer and resident child exposed to CPCs in beef and milk are given in Tables B.3.3-7(a) and B.3.3-7(b), respectively (Attachment B.III). The total risk for all CPCs consumed in beef and milk was 1.1×10^{-7} and 6.3×10^{-8} for the farmer and child, respectively. The total HI for all CPCs consumed in beef and milk was well below 1.0 for both the farmer and child.

Risks and hazards calculated for the off-property farmer and resident child exposed to CPCs in homegrown produce are given in Tables B.3.3-8(a) and B.3.3-8(b), respectively (Attachment B.III). Total risk for all CPCs consumed in homegrown produce was 2.9×10^{-8} and 9.6×10^{-9} for both the

farmer and child, respectively. The total HI for all CPCs consumed in homegrown produce was well below 1.0 for both the farmer and the child.

B.3.3.3.3 Current User of Milk/Meat Products

Risk was characterized for a current user of milk and meat products from livestock potentially grazing within the Inactive Flyash Pile Boundaries. Exposure point concentrations in meat and milk were derived from the maximum on-property current deposition rates of airborne Inactive Flyash Pile surface soil.

Risk and hazard to the current user of meat and milk products is given in Table B.3.3-9 (Attachment B.III). Total risk did not exceed 1×10^{-6} and the total HI was well below 1.0.

B.3.3.3.4 Current Groundskeeper

Risks and hazards for surface soil associated with the current groundskeeper are given in Table B.3.3-10 (Attachment B.III). Total carcinogenic risk is 4.9×10^{-5} due mostly to external radiation from radium-226 (9.6×10^{-6}), radium-228 (5.2×10^{-6}), thorium-228 (1.2×10^{-5}), thorium-232 (1.6×10^{-5}), and arsenic (2.8×10^{-6}) and dermal contact with arsenic (3.0×10^{-6}). Total hazard was less than 1.0.

B.3.3.4 Risk Characterization for Future Land Use

The future scenarios characterized for the Inactive Flyash Pile assuming continued federal ownership, include off-property farmer and resident child and an expanded trespasser. Future scenarios characterized for the Inactive Flyash Pile, assuming private ownership, include an on-property farmer and resident child living and farming adjacent outside the subunit battery limit to the Inactive Flyash Pile. Risks for a future home builder were not evaluated because no building directly on the Inactive Flyash Pile is anticipated. Risks for a future perched groundwater users were also not evaluated because there is no usable perched groundwater at the Inactive Flyash Pile. Recreational users of the Great Miami River were evaluated for federal and private ownerships.

B.3.3.4.1 Future Off-Property Farmers

The off-property farmer and resident child were presumed to contact CPCs in air via inhalation of airborne particulates; by consumption of homegrown produce irrigated with contaminated water and on which airborne soil was deposited; by ingestion of milk and beef from cattle grazing on vegetation

on which airborne soil was deposited and that consumed contaminated groundwater; and by ingestion, dermal contact, and inhalation of contaminated groundwater. All of the exposure point concentrations for this scenario were derived from modeling results as described in Section B.2.0, Methodology, and in Section 5.0, and Appendix A of this RI report.

Risks and hazards calculated for the future off-property farmer and resident child exposed to CPCs in airborne Inactive Flyash Pile surface soil are presented in Tables B.3.3-11(a) and B.3.3-11(b), respectively (Attachment B.III). Total risk associated with inhalation of all CPCs in airborne Inactive Flyash Pile soil particulates was 6.5×10^{-8} and 2.0×10^{-8} for the farmer and child, respectively. No HI exceeded 1.0.

Risks and hazards associated with ingestion of CPCs in beef and milk for the off-property farmer and resident child under federal and private ownership are given in Tables B.3.3-12(a) B.3.3-12(b), B.3.3-12(c), and B.3.3-12(d), respectively (Attachment B.III). Total risk for all CPCs consumed in beef and milk did not exceed 1.0×10^{-6} for either the farmer or child. HIs for both receptors did not exceed 1.0.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property farmer and resident child under federal and private ownership are given in Tables B.3.3-13(a) B.3.3-13(b), B.3.3-13(c), and B.3.3-13(d), respectively (Attachment B.III). The total risk for all CPCs consumed in homegrown produce was 4.6×10^{-8} and 1.1×10^{-8} for the farmer and child (federal and private ownership), respectively. The total HI for all CPCs consumed in homegrown produce was well below 1.0 for both the farmer and child (federal and private ownership).

The risks and hazards associated with exposures of the off-property farmer and resident child (under federal and private) ownership, to contaminants in groundwater are given in Tables B.3.3-14(a) B.3.3-14(b), B.3.3-14(c), and B.3.3.14(d), respectively (Attachment B.III). Total risk via all routes of direct exposure to groundwater (ingestion, inhalation, and dermal contact) for the farmer is 5.6×10^{-5} and for the resident child is 2.4×10^{-6}. Most of this risk is attributable to ingestion of the radionuclides uranium-234, and uranium-238. Total HI via all routes of exposure to groundwater for the farmer was less than 1.0, but for the child, HI was 2.2 due to the ingestion of uranium-total in groundwater.

B.3.3.4.2 Future Expanded Trespasser

The future expanded trespasser was assumed to contact CPCs directly via inhalation of airborne particulates; ingestion and dermal contact with soil, sediment, and surface water; and external radiation resulting from exposure to contaminated surface soil and sediment. The exposure point concentrations for inhalation of airborne particles, surface water, and sediment were estimated from modeling results. Exposure point concentrations for surface soil were derived from analytical data for the Inactive Flyash Pile.

Risks and hazards calculated for the future expanded trespasser exposed to CPCs in the surface soil, surface water, and sediment located on the Inactive Flyash Pile are presented in Tables B.3.3-15, B.3.3-16, and B.3.3-17, respectively (Attachment B.III). Total risk due to exposure to all CPCs in surface soil by all exposure pathways was 2.7×10^{-5}. This was primarily due to external radiation from radium-226 (5.4×10^{-6}), radium-228 (2.9×10^{-6}), thorium-228 (6.8×10^{-6}), thorium-232 (8.9×10^{-6}), and soil ingestion of arsenic (1.4×10^{-6}).

Total risk due to exposure to all CPCs in surface water did not exceed the 1.0×10^{-6} risk level. Total risk due to exposure to sediment was 2.2×10^{-6} due to the cumulative affect of all CPCs. Total HIs calculated for exposure of a future expanded trespasser to CPCs in soil, surface water, and sediment at the Inactive Flyash Pile did not exceed 1.0.

B.3.3.4.3 Future On-Property Farmers

Risks were quantified for the future on-property farmer and resident child living and farmers adjacent to the Inactive Flyash Pile and using groundwater underlying the South Field and Inactive Flyash Pile. The on-property farmer was located adjacent (i.e., outside the subunit battery limit) because the Inactive Flyash Pile is considered insufficiently stable to support a farm house or agricultural activities. Risks were calculated for inhalation of airborne soil particulates; ingestion of homegrown produce on which soil surface from the Inactive Flyash Pile was deposited and which was irrigated with contaminated groundwater; ingestion of milk and beef from livestock consuming on-property vegetation on which airborne soil from the Inactive Flyash Pile was deposited; and drinking groundwater underlying the South Field and Inactive Flyash Pile. Exposure point concentrations for surface soil were derived from analytical data for the Inactive Flyash Pile. Other exposure point concentrations were derived from modeling results. Both RME and CT risks and hazards were estimated for the on-property farmer. Risks associated with ingestion, dermal contact, and inhalation

of groundwater underlying the South Field and Inactive Flyash Pile were assessed together since it is not possible to estimate the contribution of the risks associated with these two subunits separately.

Risks and hazards for a Inactive Flyash Pile on-property RME farmer and resident child exposed to CPCs in surface soil are given in Tables B.3.3-18(a) and B.3.3-18(b), respectively (Attachment B.III). Total risk for the RME farmer was 1.0×10^{-6} due to the cumulative affect of all CPCs, and the child was 3.1×10^{-8}. HIs for the adult and child for soil were not determined because oral toxicity data for arsenic and beryllium were not available.

Risks and hazards associated with exposure to contaminants in groundwater for the RME on-property farmer and resident child are given in Tables B.3.3-19(a) and B.3.3-19(b), respectively (Attachment B.III). Significant risks are indicated for both the RME on-property farmer and the child. Total risk for the farmer was 1.5×10^{-3} due to ingestion of uranium-234, uranium-235/236, and uranium-238. Total risk for the resident child was 4.7×10^{-5} due to the ingestion of uranium-234 and uranium-238. Total HIs for the RME farmer and child were 18.1 and 41, respectively, due to the presence of uranium-total in groundwater.

Risks and hazards associated with exposure to contaminants in homegrown produce for the RME farmer are given in Table B.3.3-20(a) (Attachment B.III). The risk associated with homegrown produce for the RME farmer was 3.3×10^{-4}, due primarily to homegrown produce irrigated with groundwater contaminated with uranium-total. Total HI associated with this pathway for the RME farmer was 3.3. This was primarily due to the estimated uptake of uranium-total. For the future on-property child (Table B.3.3-20[b]) total risk was 1.5×10^{-7}, while the HI as 19 due to the ingestion of produce.

Risks and hazards associated with exposure to contaminants in beef and milk for the RME farmer and resident child are given in Table B.3.3-21(a) and B.3.3-21(b), respectively (Attachment B.III). The risk associated with beef and milk for the farmer was 1.8 x 10-6 and for the child was 1.0×10^{-6}. Again, this is largely due to the ingestion of uranium-234, uranium-238, and dibenzo(a,h)anthracene by livestock. Hazards associated with this pathway were 0.49 for the farmer and 4.9 for the child. Most of this was attributable to plant uptake of arsenic and ingestion uranium-total by cattle.

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CT estimates of risk and hazard for the future on-property farmer associated with exposures to surface soil, groundwater, homegrown produce, and beef and milk are given in Tables B.3.3-22, B.3.3-23, B.3.3-24 and B.3.3-25, respectively (Attachment B.III). Risks exceeding 1 x 10^{-6} were associated with exposures to groundwater (6.6 x 10^{-5}) and beef and milk (1.5 x 10^{-6}). The greatest proportion of all these risks was due to the presence of uranium-234 and uranium-238. Total HI for groundwater was 8.3 and homegrown produce was 1.4 due to total uranium.

B.3.3.5 Future Great Miami River User

Risks and hazards associated with future recreational users of the Great Miami River from ingestion of fish are given in Table B.3.3-26(a) (Attachment III). Total risk was 8.4 x 10^{-9}, and the HI was less than 1.0.

For the Great Miami River agricultural user, risks and hazards are given in Table B.3.3-26(b) (Attachment III). Total risk was 5.0 x 10^{-9}. HI was less than 1.0.

Risk and hazards associated with future and residential users of the Great Miami River contacting contaminated surface water are given in Table B.3.3-26(d) (Attachment III). Total risk was 3.0 x 10^{-9} and the HI was less than 1.0.

B.3.3.6 Risks Due to Estimated Radium-222 Emission

Ambient radon emissions potentially associated with the Inactive Flyash Pile, estimated as described in Section B.2.0, are summarized in Table B.3.3-28 for each receptor. Risks that would result in the Inactive Flyash Pile assuming radon emission were equivalent to what would naturally occur if radium-226 were present at background concentrations are presented for comparison. Only the future on-property RME farmer is associated with a risk exceeding 1.0 x 10^{-6}. The risk associated with this receptor is 4.2 x 10^{-6}, which exceeds the background risk of 1.9 x 10^{-6}.

B.3.3.7 Summary for Inactive Flyash Pile

Tables B.3.3-29 and B.3.3-30 summarize risks and hazards, respectively, associated with the Inactive Flyash Pile for receptors assuming current land use. Exposures of the trespassing youth to contaminated soils were associated with a total risk of 1.3 x 10^{-5} due primarily to the presence radium-226, of radium-228, thorium-228, and thorium-232 in surface soil, which account for 74 percent of total receptor risk. Total estimated risk to the groundskeeper was 4.9 x 10^{-5} due primarily

TABLE B.3.3-28
INACTIVE FLYASH PILE
RISKS DUE TO ESTIMATED RN-222 EMISSION

	Subunit			Background		
	Maximum RN-222 Air Concentration (pCi/m3)*	Intake (pCi)	Risk	Background RN-222 Air Concentration (pCi/m3)**	Intake (pCi)	Risk
Current Trespassing Youth	4.1E+00	8.5E+03	6.5E-08	1.8E+00	3.7E+03	2.9E-08
Current/Future Off-Property Farmer	2.5E-01	2.8E+04	2.2E-07	1.7E-01	2.0E+04	1.5E-07
Current/Future Off-Property Child	2.5E-01	5.1E+02	4.0E-09	1.1E-01	2.2E+02	1.7E-09
Current Groundskeeper	4.1E+00	7.1E+04	5.5E-07	1.8E+00	3.1E+04	2.4E-07
Future, Expanded Trespasser (Adult + Child)	4.1E+00	1.3E+04	1.0E-07	1.8E+00	5.8E+03	4.5E-08
Future, RME On-Property Farmer	4.8E+00	5.5E+05	4.2E-06	2.1E+00	2.4E+05	1.9E-06
Future, CT On-Property Farmer	4.8E+00	4.1E+04	3.1E-07	2.1E+00	1.8E+04	1.4E-07
Future, On-Property Child	4.8E+00	1.0E+04	7.7E-08	2.1E+00	4.4E+03	3.4E-08

*Represents the upper 95 percent confidence interval on the mean Ra-226 soil concentration.
**Assumes Ra-226 concentration is 1.228 pCi/g in surface soil and 0.78 pCi/g in subsurface soil.

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B.3.3-29
INACTIVE FLYASH PILE
CURRENT LAND USE
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Surface Soil	NP-237	1.3E-08	0.10%	0.08%	1.6E-10	0.25%	0.03%	2.9E-12	0.15%	0.00%	N/A		
	PU-238	2.4E-10	0.00%	0.00%	1.3E-10	0.20%	0.02%	2.4E-12	0.12%	0.00%	N/A		
	PU-239/240	6.5E-11	0.00%	0.00%	3.3E-11	0.05%	0.01%	6.0E-13	0.03%	0.00%	N/A		
	RA-226	2.6E-06	19.83%	16.59%	5.8E-10	0.88%	0.09%	1.0E-11	0.52%	0.01%	N/A		
	RA-228	1.4E-06	10.79%	9.02%	6.5E-11	0.10%	0.01%	1.2E-12	0.06%	0.00%	N/A		
	SR-90	3.7E-10	0.00%	0.00%	2.2E-12	0.00%	0.00%	4.1E-14	0.00%	0.00%	N/A		
	TH-228	3.2E-06	25.18%	21.06%	8.8E-09	13.48%	1.44%	1.6E-10	7.95%	0.20%	N/A		
	TH-230	1.2E-09	0.01%	0.01%	3.4E-09	5.12%	0.55%	6.1E-11	3.02%	0.08%	N/A		
	TH-232	4.2E-06	32.88%	27.50%	1.1E-08	16.34%	1.75%	1.9E-10	9.64%	0.25%	N/A		
	U-234	3.8E-09	0.03%	0.02%	9.4E-09	14.31%	1.53%	1.7E-10	8.44%	0.22%	N/A		
	U-235/236	3.1E-08	0.24%	0.20%	6.1E-10	0.94%	0.10%	1.1E-11	0.55%	0.01%	N/A		
	U-238	7.5E-08	0.58%	0.49%	1.9E-08	29.37%	3.15%	3.5E-10	17.32%	0.44%	N/A		
	Total Radiological Risk	1.2E-05	89.65%	74.99%	5.3E-08	81.04%	8.68%	9.6E-10	47.80%	1.22%			
	Arsenic	7.8E-07	6.03%	5.04%	1.2E-08	17.82%	1.91%	9.9E-10	49.04%	1.25%	N/A		
	Beryllium	2.1E-07	1.64%	1.37%	4.5E-10	0.68%	0.07%	3.8E-11	1.87%	0.05%	N/A		
	Dibenzo(a,h)anthracene	3.5E-07	2.69%	2.25%	3.1E-10	0.47%	0.05%	2.6E-11	1.29%	0.03%	N/A		
	Total Chemical Risk	1.3E-06	10.35%	8.66%	1.2E-08	18.96%	2.03%	1.0E-09	52.20%	1.34%			
	Total	1.3E-05	100.00%	83.64%	6.5E-08	100.00%	10.71%	2.0E-09	100.00%	2.56%			
Sediment	NP-237	4.2E-09	0.20%	0.03%	N/A			N/A			N/A		
	PU-238	6.7E-11	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	1.8E-11	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	8.5E-07	40.17%	5.53%	N/A			N/A			N/A		
	RA-228	4.6E-07	21.86%	3.01%	N/A			N/A			N/A		
	SR-90	1.2E-10	0.01%	0.00%	N/A			N/A			N/A		
	U-234	4.8E-10	0.02%	0.00%	N/A			N/A			N/A		
	U-235/236	9.3E-09	0.44%	0.06%	N/A			N/A			N/A		
	U-238	2.1E-08	1.00%	0.14%	N/A			N/A			N/A		
	Total Radiological Risk	1.4E-06	63.69%	8.76%									
	Arsenic	5.9E-07	28.01%	3.85%	N/A			N/A			N/A		
	Beryllium	6.7E-08	3.14%	0.43%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	1.1E-07	5.16%	0.71%	N/A			N/A			N/A		
	Total Chemical Risk	7.7E-07	36.31%	4.99%									
	Total	2.1E-06	100.00%	13.76%									

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Medium	Parameter	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil	NP-237	5.0E-08	0.10%	0.10%	N/A			N/A			N/A		
	PU-238	1.8E-09	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	4.9E-10	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	9.6E-06	19.67%	19.45%	N/A			N/A			N/A		
	RA-228	5.2E-06	10.64%	10.52%	N/A			N/A			N/A		
	SR-90	2.7E-09	0.01%	0.01%	N/A			N/A			N/A		
	TH-228	1.2E-05	24.83%	24.55%	N/A			N/A			N/A		
	TH-230	9.5E-09	0.02%	0.02%	N/A			N/A			N/A		
	TH-232	1.6E-05	32.43%	32.07%	N/A			N/A			N/A		
	U-234	3.0E-08	0.06%	0.06%	N/A			N/A			N/A		
	U-235/236	1.2E-07	0.24%	0.24%	N/A			N/A			N/A		
	U-238	3.1E-07	0.64%	0.63%	N/A			N/A			N/A		
	Total Radiological Risk	4.3E-05	88.64%	87.65%									
	Arsenic	3.0E-06	6.20%	6.13%	N/A			N/A			N/A		
	Beryllium	9.6E-07	1.95%	1.93%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	1.6E-06	3.21%	3.17%	N/A			N/A			N/A		
	Total Chemical Risk	5.6E-06	11.36%	11.24%									
	Total	4.9E-05	100.00%	98.89%									
Sediment	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												

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Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	3.2E-09	0.96%	0.02%	N/A			N/A			N/A		
	PU-238	3.9E-09	1.16%	0.03%	N/A			N/A			N/A		
	PU-239/240	2.9E-10	0.09%	0.00%	N/A			N/A			N/A		
	RA-226	6.1E-09	1.83%	0.04%	N/A			N/A			N/A		
	RA-228	7.9E-10	0.24%	0.01%	N/A			N/A			N/A		
	SR-90	1.1E-10	0.03%	0.00%	N/A			N/A			N/A		
	U-234	5.7E-08	16.97%	0.37%	N/A			N/A			N/A		
	U-235/236	3.5E-09	1.05%	0.02%	N/A			N/A			N/A		
	U-238	9.8E-08	29.16%	0.63%	N/A			N/A			N/A		
	Total Radiological Risk	1.7E-07	51.48%	1.12%									
	Arsenic	1.3E-07	38.65%	0.84%	N/A			N/A			N/A		
	Beryllium	2.7E-08	7.95%	0.17%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	6.4E-09	1.92%	0.04%	N/A			N/A			N/A		
	Total Chemical Risk	1.6E-07	48.52%	1.06%									
	Total	3.4E-07	100.00%	2.18%									
Surface Water (includes fish pathway for GMR users)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
Homegrown Produce (Dust Affected)	NP-237	N/A			1.6E-11	0.05%	0.00%	1.1E-12	0.01%	0.00%	N/A		
	PU-238	N/A			9.5E-12	0.03%	0.00%	6.7E-13	0.01%	0.00%	N/A		
	PU-239/240	N/A			2.6E-12	0.01%	0.00%	1.8E-13	0.00%	0.00%	N/A		
	RA-226	N/A			8.4E-10	2.74%	0.14%	5.9E-11	0.61%	0.08%	N/A		
	RA-228	N/A			1.2E-10	0.39%	0.02%	8.4E-12	0.09%	0.01%	N/A		
	SR-90	N/A			5.1E-11	0.16%	0.01%	3.6E-12	0.04%	0.00%	N/A		
	TH-228	N/A			7.8E-11	0.25%	0.01%	5.5E-12	0.06%	0.01%	N/A		
	TH-230	N/A			2.0E-11	0.06%	0.00%	1.4E-12	0.01%	0.00%	N/A		
	TH-232	N/A			2.1E-10	0.70%	0.04%	1.5E-11	0.16%	0.02%	N/A		
	U-234	N/A			7.3E-11	0.24%	0.01%	5.2E-12	0.05%	0.01%	N/A		
	U-235/236	N/A			5.0E-12	0.02%	0.00%	3.5E-13	0.00%	0.00%	N/A		
	U-238	N/A			1.3E-10	0.43%	0.02%	9.3E-12	0.10%	0.01%	N/A		
	Total Radiological Risk				1.6E-09	5.08%	0.26%	1.1E-10	1.13%	0.14%			
	Arsenic	N/A			2.1E-08	69.36%	3.49%	7.0E-09	72.26%	8.93%	N/A		
	Beryllium	N/A			3.1E-09	10.11%	0.51%	1.0E-09	10.54%	1.30%	N/A		
	Dibenzo(a,h)anthracene	N/A			4.7E-09	15.44%	0.78%	1.6E-09	16.07%	1.99%	N/A		
	Total Chemical Risk				2.9E-08	94.92%	4.78%	9.6E-09	98.87%	12.22%			
	Total				3.1E-08	100.00%	5.03%	9.7E-09	100.00%	12.36%			

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Medium	Parameter	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
Surface Water (includes fish pathway for GMR users)	NP-237	N/A			1.5E-12	0.02%	0.02%	3.6E-11	1.20%	1.20%	N/A		
	PU-238	N/A			4.4E-12	0.05%	0.05%	4.3E-11	1.45%	1.45%	N/A		
	PU-239/240	N/A			3.3E-13	0.00%	0.00%	3.2E-12	0.11%	0.11%	N/A		
	RA-226	N/A			1.4E-11	0.16%	0.16%	6.8E-11	2.27%	2.27%	N/A		
	RA-228	N/A			1.8E-12	0.02%	0.02%	8.7E-12	0.29%	0.29%	N/A		
	SR-90	N/A			1.5E-13	0.00%	0.00%	1.2E-12	0.04%	0.04%	N/A		
	U-234	N/A			5.4E-12	0.06%	0.06%	6.3E-10	21.03%	21.03%	N/A		
	U-235/236	N/A			3.4E-13	0.00%	0.00%	3.9E-11	1.31%	1.31%	N/A		
	U-238	N/A			9.4E-12	0.11%	0.11%	1.1E-09	36.79%	36.79%	N/A		
	Total Radiological Risk				3.7E-11	0.44%	0.44%	1.9E-09	64.49%	64.49%			
	Arsenic	N/A			1.4E-10	1.63%	1.63%	7.6E-10	25.70%	25.70%	N/A		
	Beryllium	N/A			7.0E-12	0.08%	0.08%	1.8E-10	6.05%	6.05%	N/A		
	Dibenzo(a,h)anthracene	N/A			8.2E-09	97.85%	97.85%	1.1E-10	3.76%	3.76%	N/A		
	Total Chemical Risk				8.3E-09	99.56%	99.56%	1.1E-09	35.51%	35.51%			
	Total				8.4E-09	100.00%	100.00%	3.0E-09	100.00%	100.00%			
Homegrown Produce (Dust Affected)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												

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Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
Beef/Milk (Dust Affected)	NP-237	N/A			7.2E-14	0.00%	0.00%	5.5E-15	0.00%	0.00%	7.2E-14	0.00%	0.00%
	PU-238	N/A			5.4E-16	0.00%	0.00%	5.6E-17	0.00%	0.00%	5.4E-16	0.00%	0.00%
	PU-239/240	N/A			1.6E-16	0.00%	0.00%	1.6E-17	0.00%	0.00%	1.6E-16	0.00%	0.00%
	RA-226	N/A			1.5E-10	0.13%	0.02%	2.6E-11	0.04%	0.03%	1.5E-10	0.13%	0.13%
	RA-228	N/A			1.4E-11	0.01%	0.00%	2.4E-12	0.00%	0.00%	1.4E-11	0.01%	0.01%
	SR-90	N/A			1.6E-10	0.14%	0.03%	3.0E-11	0.05%	0.04%	1.6E-10	0.14%	0.14%
	TH-228	N/A			1.1E-13	0.00%	0.00%	1.7E-14	0.00%	0.00%	1.1E-13	0.00%	0.00%
	TH-230	N/A			1.2E-13	0.00%	0.00%	2.0E-14	0.00%	0.00%	1.2E-13	0.00%	0.00%
	TH-232	N/A			1.4E-12	0.00%	0.00%	2.2E-13	0.00%	0.00%	1.4E-12	0.00%	0.00%
	U-234	N/A			1.0E-11	0.01%	0.00%	1.9E-12	0.00%	0.00%	1.0E-11	0.01%	0.01%
	U-235/236	N/A			7.0E-13	0.00%	0.00%	1.3E-13	0.00%	0.00%	7.0E-13	0.00%	0.00%
	U-238	N/A			1.8E-11	0.02%	0.00%	3.4E-12	0.01%	0.00%	1.8E-11	0.02%	0.02%
	Total Radiological Risk				3.5E-10	0.31%	0.06%	6.4E-11	0.10%	0.08%	3.5E-10	0.31%	0.31%
	Arsenic	N/A			7.4E-09	6.48%	1.21%	1.7E-09	2.77%	2.22%	7.4E-09	6.48%	6.48%
	Beryllium	N/A			3.6E-10	0.31%	0.06%	5.6E-11	0.09%	0.07%	3.6E-10	0.31%	0.31%
	Dibenzo(a,h)anthracene	N/A			1.1E-07	92.90%	17.38%	6.1E-08	97.04%	77.67%	1.1E-07	92.90%	92.90%
	Total Chemical Risk				1.1E-07	99.69%	18.66%	6.3E-08	99.90%	79.96%	1.1E-07	99.69%	99.69%
	Total				1.1E-07	100.00%	18.71%	6.3E-08	100.00%	80.04%	1.1E-07	100.00%	100.00%
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
Ambient Radon		6.5E-08		0.42%	2.2E-07		35.78%	4.0E-09		5.04%	N/A		
ALL MEDIA		1.5E-05			6.1E-07			7.9E-08			1.1E-07		

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Medium	Parameter	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			1.1E-11	1.20%	0.21%
	PU-238	N/A			N/A			N/A			1.3E-11	1.42%	0.24%
	PU-239/240	N/A			N/A			N/A			9.7E-13	0.11%	0.02%
	RA-226	N/A			N/A			N/A			2.1E-11	2.32%	0.40%
	RA-228	N/A			N/A			N/A			2.6E-12	0.29%	0.05%
	SR-90	N/A			N/A			N/A			4.2E-13	0.05%	0.01%
	U-234	N/A			N/A			N/A			1.9E-10	20.69%	3.55%
	U-235/236	N/A			N/A			N/A			1.2E-11	1.29%	0.22%
	U-238	N/A			N/A			N/A			*3.3E-10*	*36.21%*	*6.21%*
	Total Radiological Risk										*5.8E-10*	*63.56%*	*10.89%*
	Arsenic	N/A			N/A			N/A			3.0E-10	32.47%	*5.57%*
	Beryllium	N/A			N/A			N/A			3.0E-11	3.24%	*0.56%*
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			6.7E-12	0.74%	*0.13%*
	Total Chemical Risk										3.3E-10	36.45%	*6.25%*
	Total										*9.1E-10*	100.00%	*17.14%*
Beef/Milk (Dust Affected)	NP-237	N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A		
	Total Radiological Risk												
	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene				N/A			N/A			N/A		
	Total Chemical Risk												
	Total												
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			2.4E-11	0.55%	*0.46%*
	PU-238	N/A			N/A			N/A			2.4E-13	0.01%	*0.00%*
	PU-239/240	N/A			N/A			N/A			1.8E-14	0.00%	*0.00%*
	RA-226	N/A			N/A			N/A			2.6E-10	5.83%	*4.83%*
	RA-228	N/A			N/A			N/A			2.5E-11	0.56%	*0.46%*
	SR-90	N/A			N/A			N/A			1.0E-11	0.23%	*0.19%*
	U-234	N/A			N/A			N/A			1.4E-09	31.77%	*26.33%*
	U-235/236	N/A			N/A			N/A			8.7E-11	1.97%	*1.64%*
	U-238	N/A			N/A			N/A			2.4E-09	55.60%	*46.07%*
	Total Radiological Risk										4.3E-09	96.52%	*79.98%*
	Arsenic	N/A			N/A			N/A			5.5E-11	1.24%	*1.03%*
	Beryllium	N/A			N/A			N/A			1.6E-12	0.04%	*0.03%*
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			9.7E-11	2.20%	*1.82%*
	Total Chemical Risk										1.5E-10	3.48%	*2.88%*
	Total										4.4E-09	100.00%	*82.86%*
Ambient Radon		5.5E-07		1.11%	N/A			N/A			N/A		
ALL MEDIA		5.0E-05			8.4E-09			3.0E-09			*5.3E-09*		

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TABLE B.3.3-30
INACTIVE FLYASH PILE
CURRENT LAND USE
SUMMARY OF NON-CARCINOGENIC HAZARD

Medium	Parameter	Trespassing Youth	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Farmer	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil	Arsenic	8.6E-03	57.50%	8.28%	N/D			N/D		
	Beryllium	6.3E-03	42.50%	6.12%	N/D			N/D		
	Total	1.5E-02	100.00%	14.40%						
Sediment	Arsenic	4.2E-03	10.84%	4.03%	N/A			N/A		
	Beryllium	7.7E-03	20.03%	7.45%	N/A			N/A		
	U-Total	2.7E-02	69.14%	25.72%						
	Total	3.9E-02	100.00%	37.19%						
Surface Water	Arsenic	1.4E-03	1.87%	1.39%	N/A			N/A		
	Beryllium	5.7E-05	0.07%	0.05%	N/A			N/A		
	U-TOTAL	7.5E-02	98.05%	72.68%	N/A			N/A		
	Total	7.7E-02	100.00%	74.12%						
GMR Surface Water	Arsenic	N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A		
	Cadmium	N/A			N/A			N/A		
	Total									
Homegrown Produce (Fruits and veg., Dust) Affected)	Arsenic	N/A			4.1E-05	99.65%	73.99%	1.6E-04	99.65%	79.86%
	Beryllium	N/A			1.4E-07	0.35%	0.26%	5.6E-07	0.35%	0.28%
	Total				4.1E-05	100.00%	74.26%	1.6E-04	100.00%	80.15%
Homegrown Produce (Fruits and veg., GMR Surf Water Affected)	Arsenic	N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A		
	Cadmium	N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A		
	Total									
Beef/Milk (Dust Affected)	Arsenic	N/A			1.4E-05	99.88%	25.71%	3.9E-05	99.92%	19.84%
	Beryllium	N/A			1.7E-08	0.12%	0.03%	3.0E-08	0.08%	0.02%
	Total				1.4E-05	100.00%	25.74%	3.9E-05	100.00%	19.85%
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A		
	Cadmium	N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A		
	Total									
ALL MEDIA		**1.0E-01**			**5.5E-05**			**2.0E-04**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - Not determined because toxicity data are not available.

TABLE B.3.3-30
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Hazard	% Total Receptor Hazard	Grounds-keeper	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Resid. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil	Arsenic	N/A			1.6E-02	81.55%	81.55%	N/A			N/A			N/A		
	Beryllium	N/A			3.6E-03	18.45%	18.45%	N/A			N/A			N/A		
	Total				2.0E-02	100.00%	100.00%									
Sediment	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	U-Total	N/A			N/A			N/A			N/A			N/A		
	Total															
Surface Water	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A		
	Total															
GMR Surface Water	Arsenic	N/A			N/A			6.0E-07	31.73%	31.73%	1.5E-06	34.70%	34.70%			
	Beryllium	N/A			N/A			1.0E-09	0.05%	0.05%	5.4E-09	0.13%	0.13%			
	U-TOTAL	N/A			N/A			3.0E-07	15.54%	15.54%	1.4E-06	32.58%	32.58%			
	Cadmium	N/A			N/A			1.0E-06	52.68%	52.68%	1.4E-06	32.58%	32.58%			
	Total							1.9E-06	100.00%	100.00%	4.2E-06	100.00%	100.00%			
Homegrown Produce (Fruits and veg., Dust) Affected)	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A			N/A		
	Total															
Homegrown Produce (Fruits and veg., GMR Surf. Water Affected)	Arsenic	N/A			N/A			N/A			N/A			5.6E-07	2.34%	1.57%
	Beryllium	N/A			N/A			N/A			N/A			1.4E-09	0.01%	0.00%
	Cadmium	N/A			N/A			N/A			N/A			1.9E-05	79.39%	53.04%
	U-TOTAL	N/A			N/A			N/A			N/A			4.4E-06	18.26%	12.19%
	Total													2.4E-05	100.00%	66.80%
Beef/Milk (Dust Affected)	Arsenic	1.4E-05	99.88%	99.88%	N/A			N/A			N/A			N/A		
	Beryllium	1.7E-08	0.12%	0.12%	N/A			N/A			N/A			N/A		
					N/A			N/A			N/A			N/A		
	Total	1.4E-05	100.00%	100.00%												
Beef/Milk (GMR Surface Water Affected)	Arsenic				N/A			N/A			N/A			1.0E-07	0.87%	0.29%
	Beryllium				N/A			N/A			N/A			7.4E-11	0.00%	0.00%
	Cadmium				N/A			N/A			N/A			1.1E-05	93.65%	31.09%
	U-TOTAL													6.5E-07	5.48%	1.82%
	Total													1.2E-05	100.00%	33.20%
ALL MEDIA		**1.4E-05**			**2.0E-02**			**1.9E-06**			**4.2E-06**			**3.6E-05**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - Not determined because toxicity data are not available.

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to radium-226, radium-228 and thorium-232 which accounted for approximately 87 percent of the total receptor risk.

Tables B.3.3-31 and B.3.3-32 summarize risk and hazard, respectively, associated with the Inactive Flyash Pile for receptors assuming future land use. The greatest carcinogenic risk was the risk associated with groundwater use by the RME on-property farmer which was 1.1 x 10^{-3}) due mostly to the future estimated concentrations of uranium-234 and uranium-238 in groundwater. The beef and milk pathway also contributed significant risk to this (3.6 x 10^{-6}) and other on-property receptors. The greatest hazard to all on-property receptors was due to the estimated presence of uranium-total in groundwater. Exposures resulting in HIs greater than 1.0 were associated with on-property residents and off-property child via ingestion of groundwater and homegrown produce contaminated with uranium-total.

Total carcinogenic risk to the expanded trespasser was 3.0 x 10^{-5}. That was due primarily to ingestion of surface soil containing radium-226, radium-228, thorium-228, thorium-232 and arsenic which accounts for approximately 86 percent.

Total estimated risk to the off-property farmers (private and federal ownership) exceeded the 1.0 x 10^{-6} threshold level due mostly to direct exposure to the estimated future concentrations of uranium-234 an uranium-238 in groundwater which together account for approximately 95 percent for the farmer and 85 percent for the child total risk to the receptor. Total HIs were below 1.0.

Total estimated risk to the on-property CT farmer was 8.6 x 10^{-5} due mostly to the presence of uranium-234 and uranium-238 in groundwater which accounts for approximately 95 percent of the total receptor risk. Total HI for this receptor did not exceed 1.0.

For the Great Miami River users, the Great Miami River recreational user had a total risk of 8.4 x 10^{-9}, the Great Miami River residential user had a total risk of 3.0 x 10^{-9}, and the Great Miami River agricultural user had a total risk of 5.0 x 10^{-9}. Total HIs for these receptors were below 1.0.

B.3.4 SOLID WASTE LANDFILL

B.3.4.1 Exposure Point Concentrations

Table B.3.4-1 summarizes the exposure scenarios evaluated to assess risk associated with the Solid Waste Landfill. It also summarizes derivation of exposure concentrations specific to this subunit. Exposure point concentrations for surface soil were derived from analytical data on samples collected within the boundaries of the Solid Waste Landfill subunit. All other exposure point concentrations were derived using modeled results. For the future on-property farmer, it was assumed that the farmer resided on the Solid Waste Landfill and simultaneously farmed that area. The Solid Waste Landfill was chosen as a farm and residence site since it is feasible to place either a home or an agricultural field on this subunit. Because of the feasibility of constructing a home on the Solid Waste Landfill, risks to a potential homebuilder were also determined for this area. Additionally, because the Solid Waste Landfill is underlain by perched groundwater, risks to a future perched groundwater user were assessed. This and other relevant information regarding exposure point concentrations for the Solid Waste Landfill is summarized in Table B.3.4-1.

B.3.4.2 Constituents of Potential Concern

The CPCs identified for surface soil, subsurface soil, and seeps are summarized in Tables B.3.4-2(a), (b), and (c), respectively (Attachment B.III). Table B.3.4-3 summarizes CPCs for the Solid Waste Landfill by medium.

B.3.4.3 Risk Characterization for Current Land Use

The scenarios characterized for the Solid Waste Landfill assuming continued DOE ownership with access controls are a trespassing youth; the off-property farmer and resident child using food products from livestock grazing off-property and from produce grown off-property; an on-property groundskeeper exposed to on-site contaminant concentrations; and a Great Miami River recreational user, a Great Miami River agricultural user, and a Great Miami River residential user. In the event that the FEMP lost access, a user of meat and milk products from livestock grazing on-property was also evaluated.

B.3.4.3.1 Trespassing Youth

Risk was characterized for the trespassing youth contacting CPCs via ingestion and dermal contact with surface soil within the subunit; external radiation resulting from exposure to surface soil and

TABLE B.3.3-31
FUTURE LAND USE
INACTIVE FLYASH PILE
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Expanded Trespasser User	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	NP-237	2.7E-08	0.10%	0.09%	1.6E-10	0.247%	0.00%	1.6E-10	0.25%	0.00%	2.9E-12	0.146%	0.00%	2.9E-12	0.15%	0.00%	2.5E-09	0.24%	0.00%
	PU-238	6.3E-10	0.00%	0.00%	1.3E-10	0.20%	0.00%	1.3E-10	0.20%	0.00%	2.4E-12	0.12%	0.00%	2.4E-12	0.12%	0.00%	2.1E-09	0.20%	0.00%
	PU-239/240	1.7E-10	0.00%	0.00%	3.3E-11	0.05%	0.00%	3.3E-11	0.05%	0.00%	6.0E-13	0.03%	0.00%	6.0E-13	0.03%	0.00%	5.2E-10	0.05%	0.00%
	RA-226	5.4E-06	19.57%	17.88%	5.8E-10	0.88%	0.00%	5.8E-10	0.88%	0.00%	1.0E-11	0.52%	0.00%	1.0E-11	0.52%	0.00%	9.0E-09	0.88%	0.00%
	RA-228	2.9E-06	10.63%	9.71%	6.5E-11	0.10%	0.00%	6.5E-11	0.10%	0.00%	1.2E-12	0.06%	0.00%	1.2E-12	0.06%	0.00%	1.0E-09	0.10%	0.00%
	SR-90	1.0E-09	0.00%	0.00%	2.2E-12	0.00%	0.00%	2.2E-12	0.00%	0.00%	4.1E-14	0.00%	0.00%	4.1E-14	0.00%	0.00%	3.5E-11	0.00%	0.00%
	TH-228	6.8E-06	24.80%	22.65%	8.8E-09	13.48%	0.01%	8.8E-09	13.48%	0.01%	1.6E-10	7.95%	0.00%	1.6E-10	7.95%	0.00%	1.4E-07	13.47%	0.01%
	TH-230	2.4E-09	0.01%	0.01%	3.4E-09	5.12%	0.00%	3.4E-09	5.12%	0.00%	6.1E-11	3.02%	0.00%	6.1E-11	3.02%	0.00%	5.2E-08	5.11%	0.00%
	TH-232	8.9E-06	32.38%	29.58%	1.1E-08	16.34%	0.01%	1.1E-08	16.34%	0.01%	1.9E-10	9.64%	0.00%	1.9E-10	9.64%	0.00%	1.7E-07	16.37%	0.01%
	U-234	7.9E-09	0.03%	0.03%	9.4E-09	14.31%	0.01%	9.4E-09	14.31%	0.01%	1.7E-10	8.44%	0.00%	1.7E-10	8.44%	0.00%	1.5E-07	14.32%	0.01%
	U-235/236	6.5E-08	0.24%	0.22%	6.1E-10	0.94%	0.00%	6.1E-10	0.94%	0.00%	1.1E-11	0.55%	0.00%	1.1E-11	0.55%	0.00%	9.8E-09	0.96%	0.00%
	U-238	1.6E-07	0.57%	0.53%	1.9E-08	29.37%	0.03%	1.9E-08	29.37%	0.03%	3.5E-10	17.32%	0.01%	3.5E-10	17.32%	0.01%	3.0E-07	29.42%	0.02%
	Total Radiological Risk	2.4E-05	88.34%	80.70%	5.3E-08	81.04%	0.07%	5.3E-08	81.04%	0.07%	9.6E-10	47.80%	0.02%	9.6E-10	47.80%	0.02%	8.3E-07	81.12%	0.06%
	Arsenic	2.0E-06	7.14%	6.52%	1.2E-08	17.82%	0.02%	1.2E-08	17.82%	0.02%	9.9E-10	49.04%	0.02%	9.9E-10	49.04%	0.02%	1.8E-07	17.72%	0.01%
	Beryllium	4.7E-07	1.71%	1.56%	4.5E-10	0.68%	0.00%	4.5E-10	0.68%	0.00%	3.8E-11	1.87%	0.00%	3.8E-11	1.87%	0.00%	6.9E-09	0.68%	0.00%
	Dibenzo(a,h)anthracene	7.7E-07	2.81%	2.57%	3.1E-10	0.47%	0.00%	3.1E-10	0.47%	0.00%	2.6E-11	1.29%	0.00%	2.6E-11	1.29%	0.00%	4.9E-09	0.48%	0.00%
	Total Chemical Risk	3.2E-06	11.66%	10.65%	1.2E-08	18.96%	0.02%	1.2E-08	18.96%	0.02%	1.0E-09	52.20%	0.03%	1.0E-09	52.20%	0.03%	1.9E-07	18.88%	0.01%
	Total	2.7E-05	100.00%	91.35%	6.5E-08	100.00%	0.09%	6.5E-08	100.00%	0.09%	2.0E-09	100.00%	0.05%	2.0E-09	100.00%	0.05%	1.0E-06	100.00%	0.07%
Sediment	NP-237	4.2E-09	0.19%	0.01%	N/A			N/A			N/A			N/A			N/A		
	PU-238	7.0E-11	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	1.9E-11	0.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	RA-226	8.5E-07	39.46%	2.84%	N/A			N/A			N/A			N/A			N/A		
	RA-228	4.6E-07	21.47%	1.54%	N/A			N/A			N/A			N/A			N/A		
	SR-90	1.2E-10	0.01%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-234	5.0E-10	0.02%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-235/236	9.3E-09	0.43%	0.03%	N/A			N/A			N/A			N/A			N/A		
	U-238	2.1E-08	0.98%	0.07%	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	1.4E-06	62.57%	4.50%															
	Arsenic	6.2E-07	28.88%	2.08%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	7.0E-08	3.23%	0.23%	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	1.1E-07	5.32%	0.38%	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	8.1E-07	37.43%	2.69%															
	Total	2.2E-06	100.00%	7.20%															

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TABLE B.3.3-31
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	NP-237	1.8E-10	0.24%	0.00%	4.4E-11	0.14%	0.00%	N/A			N/A			N/A		
	PU-238	1.5E-10	0.20%	0.00%	3.7E-11	0.12%	0.00%	N/A			N/A			N/A		
	PU-239/240	3.8E-11	0.05%	0.00%	9.4E-12	0.03%	0.00%	N/A			N/A			N/A		
	RA-226	6.7E-10	0.88%	0.00%	1.6E-10	0.52%	0.00%	N/A			N/A			N/A		
	RA-228	7.4E-11	0.10%	0.00%	1.8E-11	0.06%	0.00%	N/A			N/A			N/A		
	SR-90	2.6E-12	0.00%	0.00%	6.4E-13	0.00%	0.00%	N/A			N/A			N/A		
	TH-228	1.0E-08	13.47%	0.01%	2.5E-09	7.96%	0.00%	N/A			N/A			N/A		
	TH-230	3.9E-09	5.11%	0.00%	9.4E-10	3.02%	0.00%	N/A			N/A			N/A		
	TH-232	1.2E-08	16.37%	0.01%	3.0E-09	9.67%	0.00%	N/A			N/A			N/A		
	U-234	1.1E-08	14.32%	0.01%	2.6E-09	8.47%	0.00%	N/A			N/A			N/A		
	U-235/236	7.2E-10	0.96%	0.00%	1.8E-10	0.57%	0.00%	N/A			N/A			N/A		
	U-238	2.2E-08	29.42%	0.03%	5.4E-09	17.39%	0.01%	N/A			N/A			N/A		
	Total Radiological Risk	6.1E-08	81.12%	0.07%	1.5E-08	47.94%	0.02%									
	Arsenic	1.3E-08	17.72%	0.02%	1.5E-08	48.87%	0.02%	N/A			N/A			N/A		
	Beryllium	5.1E-10	0.68%	0.00%	5.8E-10	1.87%	0.00%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	3.6E-10	0.48%	0.00%	4.1E-10	1.31%	0.00%	N/A			N/A			N/A		
	Total Chemical Risk	1.4E-08	18.88%	0.02%	1.6E-08	52.06%	0.02%									
	Total	7.5E-08	100.00%	0.09%	3.1E-08	100.00%	0.04%									
Sediment	NP-237	N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															

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TABLE B.3.3-31
(continued)

Medium	Parameter	Expanded Trespasser User	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Groundwater	NP-237	N/A			3.0E-09	0.01%	0.00%	3.0E-09	0.01%	0.00%	1.3E-10	0.01%	0.00%	1.3E-10	0.01%	0.00%	2.0E-07	0.02%	0.01%
	SR-90	N/A			4.0E-09	0.01%	0.01%	4.0E-09	0.01%	0.01%	1.7E-10	0.01%	0.00%	1.7E-10	0.01%	0.00%	4.8E-08	0.00%	0.00%
	TC-99	N/A			6.2E-08	0.11%	0.08%	6.2E-08	0.11%	0.08%	2.7E-09	0.11%	0.07%	2.7E-09	0.11%	0.07%	1.2E-07	0.01%	0.01%
	U-234	N/A			1.9E-05	33.45%	24.98%	1.9E-05	33.45%	24.98%	8.1E-07	33.45%	20.19%	8.1E-07	33.45%	20.19%	3.7E-04	33.52%	25.06%
	U-235/236	N/A			1.0E-06	1.78%	1.33%	1.0E-06	1.78%	1.33%	4.3E-08	1.78%	1.08%	4.3E-08	1.78%	1.08%	2.0E-05	1.79%	1.34%
	U-238	N/A			3.6E-05	64.64%	48.26%	3.6E-05	64.64%	48.26%	1.6E-06	64.64%	39.01%	1.6E-06	64.64%	39.01%	7.1E-04	64.66%	48.33%
	Total Radiological Risk				5.6E-05	100.00%	74.66%	5.6E-05	100.00%	74.66%	2.4E-06	100.00%	60.34%	2.4E-06	100.00%	60.34%	1.1E-03	100.00%	74.75%
Surface Water	NP-237	3.2E-09	0.96%	0.01%	N/A			N/A			N/A			N/A			N/A		
	PU-238	3.9E-09	1.16%	0.01%	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	2.9E-10	0.09%	0.00%	N/A			N/A			N/A			N/A			N/A		
	RA-226	6.1E-09	1.83%	0.02%	N/A			N/A			N/A			N/A			N/A		
	RA-228	7.9E-10	0.24%	0.00%	N/A			N/A			N/A			N/A			N/A		
	SR-90	1.1E-10	0.03%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-234	5.7E-08	16.97%	0.19%	N/A			N/A			N/A			N/A			N/A		
	U-235/236	3.5E-09	1.05%	0.01%	N/A			N/A			N/A			N/A			N/A		
	U-238	9.8E-08	29.16%	0.33%	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	1.7E-07	51.48%	0.58%															
	Arsenic	1.3E-07	38.65%	0.43%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	2.7E-08	7.95%	0.09%	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	6.4E-09	1.92%	0.02%	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	1.6E-07	48.52%	0.54%															
	Total	3.4E-07	100.00%	1.12%															
Surface Water (includes fish pathway for GMR users)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		

TABLE B.3.3-31
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Groundwater	NP-237	1.2E-08	0.02%	0.01%	8.8E-09	0.02%	0.01%	N/A			N/A			N/A		
	SR-90	2.9E-09	0.00%	0.00%	2.1E-09	0.00%	0.00%	N/A			N/A			N/A		
	TC-99	7.0E-09	0.01%	0.01%	5.0E-09	0.01%	0.01%	N/A			N/A			N/A		
	U-234	2.2E-05	33.52%	25.67%	1.6E-05	33.52%	20.34%	N/A			N/A			N/A		
	U-235/236	1.2E-06	1.79%	1.37%	8.4E-07	1.79%	1.08%	N/A			N/A			N/A		
	U-238	4.3E-05	64.66%	49.53%	3.0E-05	64.66%	39.23%	N/A			N/A			N/A		
	Total Radiological Risk	6.6E-05	100.00%	76.59%	4.7E-05	100.00%	60.67%									
Surface Water	NP-237	N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															
Surface Water (includes fish pathway for GMR users)	NP-237	N/A			N/A			1.5E-12	0.02%	0.02%	3.6E-11	1.20%	1.20%	N/A		
	PU-238	N/A			N/A			4.4E-12	0.05%	0.05%	4.3E-11	1.45%	1.45%	N/A		
	PU-239/240	N/A			N/A			3.3E-13	0.00%	0.00%	3.2E-12	0.11%	0.11%	N/A		
	RA-226	N/A			N/A			1.4E-11	0.16%	0.16%	6.8E-11	2.27%	2.27%	N/A		
	RA-228	N/A			N/A			1.8E-12	0.02%	0.02%	8.7E-12	0.29%	0.29%	N/A		
	SR-90	N/A			N/A			1.5E-13	0.00%	0.00%	1.2E-12	0.04%	0.04%	N/A		
	U-234	N/A			N/A			5.4E-12	0.06%	0.06%	6.3E-10	21.03%	21.03%	N/A		
	U-235/236	N/A			N/A			3.4E-13	0.00%	0.00%	3.9E-11	1.31%	1.31%	N/A		
	U-238	N/A			N/A			9.4E-12	0.11%	0.11%	1.1E-09	36.79%	36.79%	N/A		
	Total Radiological Risk							3.7E-11	0.44%	0.44%	1.9E-09	64.49%	64.49%			
	Arsenic	N/A			N/A			1.4E-10	1.63%	1.63%	7.6E-10	25.70%	25.70%	N/A		
	Beryllium	N/A			N/A			7.0E-12	0.08%	0.08%	1.8E-10	6.05%	6.05%	N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			8.2E-09	97.85%	97.85%	1.1E-10	3.76%	3.76%	N/A		
	Total Chemical Risk							8.3E-09	99.56%	99.56%	1.1E-09	35.51%	35.51%			
	Total							8.4E-09	100.00%	100.00%	3.0E-09	100.00%	100.00%			

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(continued)

Medium	Parameter	Expended Trespasser User	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	NP-237	N/A			1.6E-11	0.05%	0.00%	1.6E-11	0.05%	0.00%	1.1E-12	0.01%	0.00%	1.1E-12	0.01%	0.00%	2.4E-10	0.05%	0.00%
	PU-238	N/A			9.5E-12	0.03%	0.00%	9.5E-12	0.03%	0.00%	6.7E-13	0.01%	0.00%	6.7E-13	0.01%	0.00%	1.5E-10	0.03%	0.00%
	PU-239/240	N/A			2.6E-12	0.01%	0.00%	2.6E-12	0.01%	0.00%	1.8E-13	0.00%	0.00%	1.8E-13	0.00%	0.00%	4.0E-11	0.01%	0.00%
	RA-226	N/A			8.4E-10	2.74%	0.00%	8.4E-10	2.74%	0.00%	5.9E-11	0.61%	0.00%	5.9E-11	0.61%	0.00%	1.3E-08	2.75%	0.00%
	RA-228	N/A			1.2E-10	0.39%	0.00%	1.2E-10	0.39%	0.00%	8.4E-12	0.09%	0.00%	8.4E-12	0.09%	0.00%	1.9E-09	0.39%	0.00%
	SR-90	N/A			5.1E-11	0.16%	0.00%	5.1E-11	0.16%	0.00%	3.6E-12	0.04%	0.00%	3.6E-12	0.04%	0.00%	7.9E-10	0.16%	0.00%
	TH-228	N/A			7.8E-11	0.25%	0.00%	7.8E-11	0.25%	0.00%	5.5E-12	0.06%	0.00%	5.5E-12	0.06%	0.00%	1.2E-09	0.25%	0.00%
	TH-230	N/A			2.0E-11	0.06%	0.00%	2.0E-11	0.06%	0.00%	1.4E-12	0.01%	0.00%	1.4E-12	0.01%	0.00%	3.0E-10	0.06%	0.00%
	TH-232	N/A			2.1E-10	0.70%	0.00%	2.1E-10	0.70%	0.00%	1.5E-11	0.16%	0.00%	1.5E-11	0.16%	0.00%	3.4E-09	0.70%	0.00%
	U-234	N/A			7.3E-11	0.24%	0.00%	7.3E-11	0.24%	0.00%	5.2E-12	0.05%	0.00%	5.2E-12	0.05%	0.00%	1.1E-09	0.24%	0.00%
	U-235/236	N/A			5.0E-12	0.02%	0.00%	5.0E-12	0.02%	0.00%	3.5E-13	0.00%	0.00%	3.5E-13	0.00%	0.00%	8.0E-11	0.02%	0.00%
	U-238	N/A			1.3E-10	0.43%	0.00%	1.3E-10	0.43%	0.00%	9.3E-12	0.10%	0.00%	9.3E-12	0.10%	0.00%	2.1E-09	0.43%	0.00%
	Total Radiological Risk				1.6E-09	5.08%	0.00%	1.6E-09	5.08%	0.00%	1.1E-10	1.13%	0.00%	1.1E-10	1.13%	0.00%	2.4E-08	5.09%	0.00%
	Arsenic	N/A			2.1E-08	69.36%	0.03%	2.1E-08	69.36%	0.03%	7.0E-09	72.26%	0.18%	7.0E-09	72.26%	0.18%	3.3E-07	69.06%	0.02%
	Beryllium	N/A			3.1E-09	10.11%	0.00%	3.1E-09	10.11%	0.00%	1.0E-09	10.54%	0.03%	1.0E-09	10.54%	0.03%	4.8E-08	10.09%	0.00%
	Dibenzo(a,h)anthracene	N/A			4.7E-09	15.44%	0.01%	4.7E-09	15.44%	0.01%	1.6E-09	16.07%	0.04%	1.6E-09	16.07%	0.04%	7.5E-08	15.76%	0.01%
	Total Chemical Risk				2.9E-08	94.92%	0.04%	2.9E-08	94.92%	0.04%	9.6E-09	98.87%	0.24%	9.6E-09	98.87%	0.24%	4.5E-07	94.91%	0.03%
	Total				3.1E-08	100.00%	0.04%	3.1E-08	100.00%	0.04%	9.7E-09	100.00%	0.24%	9.7E-09	100.00%	0.24%	4.8E-07	100.00%	0.03%
Homegrown Produce (Fruits and Vegetables, Groundwater Affected)	NP-237	N/A			9.2E-10	0.01%	0.00%	9.2E-10	0.01%	0.00%	6.5E-11	0.01%	0.00%	6.5E-11	0.01%	0.00%	6.2E-08	0.02%	0.00%
	SR-90	N/A			4.3E-09	0.03%	0.01%	4.3E-09	0.03%	0.01%	3.0E-10	0.03%	0.01%	3.0E-10	0.03%	0.01%	5.1E-08	0.02%	0.00%
	U-234	N/A			5.7E-06	33.44%	7.53%	5.7E-06	33.44%	7.53%	4.0E-07	33.44%	10.01%	4.0E-07	33.44%	10.01%	1.1E-04	33.51%	7.55%
	U-235/236	N/A			3.0E-07	1.78%	0.40%	3.0E-07	1.78%	0.40%	2.1E-08	1.78%	0.53%	2.1E-08	1.78%	0.53%	5.9E-06	1.79%	0.40%
	U-238	N/A			1.1E-05	64.62%	14.54%	1.1E-05	64.62%	14.54%	7.7E-07	64.62%	19.34%	7.7E-07	64.62%	19.34%	2.1E-04	64.65%	14.57%
	TC-99	N/A			2.0E-08	0.12%	0.03%	2.0E-08	0.12%	0.03%	1.4E-09	0.12%	0.04%	1.4E-09	0.12%	0.04%	3.7E-08	0.01%	0.00%
	Total Radiological Risk				1.7E-05	100.00%	22.51%	1.7E-05	100.00%	22.51%	1.2E-06	100.00%	29.93%	1.2E-06	100.00%	29.93%	3.3E-04	100.00%	22.53%

(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	NP-237	1.3E-11	0.05%	0.00%	1.7E-11	0.01%	0.00%	N/A			N/A			N/A		
	PU-238	8.1E-12	0.03%	0.00%	1.0E-11	0.01%	0.00%	N/A			N/A			N/A		
	PU-239/240	2.2E-12	0.01%	0.00%	2.8E-12	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	7.2E-10	2.75%	0.00%	9.3E-10	0.61%	0.00%	N/A			N/A			N/A		
	RA-228	1.0E-10	0.39%	0.00%	1.3E-10	0.09%	0.00%	N/A			N/A			N/A		
	SR-90	4.3E-11	0.16%	0.00%	5.6E-11	0.04%	0.00%	N/A			N/A			N/A		
	TH-228	6.7E-11	0.25%	0.00%	8.5E-11	0.06%	0.00%	N/A			N/A			N/A		
	TH-230	1.7E-11	0.06%	0.00%	2.1E-11	0.01%	0.00%	N/A			N/A			N/A		
	TH-232	1.8E-10	0.70%	0.00%	2.4E-10	0.16%	0.00%	N/A			N/A			N/A		
	U-234	6.3E-11	0.24%	0.00%	8.1E-11	0.05%	0.00%	N/A			N/A			N/A		
	U-235/236	4.4E-12	0.02%	0.00%	5.6E-12	0.00%	0.00%	N/A			N/A			N/A		
	U-238	1.1E-10	0.43%	0.00%	1.5E-10	0.10%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	1.3E-09	5.09%	0.00%	1.7E-09	1.14%	0.00%									
	Arsenic	1.8E-08	69.06%	0.02%	1.1E-07	71.95%	0.14%	N/A			N/A			N/A		
	Beryllium	2.7E-09	10.09%	0.00%	1.6E-08	10.51%	0.02%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	4.1E-09	15.76%	0.00%	2.5E-08	16.40%	0.03%	N/A			N/A			N/A		
	Total Chemical Risk	2.5E-08	94.91%	0.03%	1.5E-07	98.86%	0.19%									
	Total	2.6E-08	100.00%	0.03%	1.5E-07	100.00%	0.20%									
Homegrown Produce (Fruits and Vegetables, Groundwater Affected)	NP-237	3.4E-09	0.02%	0.00%	4.4E-09	0.02%	0.01%	N/A			N/A			N/A		
	SR-90	2.8E-09	0.02%	0.00%	3.6E-09	0.02%	0.00%	N/A			N/A			N/A		
	U-234	6.1E-06	33.51%	7.07%	7.8E-06	33.51%	10.09%	N/A			N/A			N/A		
	U-235/236	3.2E-07	1.79%	0.38%	4.2E-07	1.79%	0.54%	N/A			N/A			N/A		
	U-238	1.2E-05	64.65%	13.63%	1.5E-05	64.65%	19.46%	N/A			N/A			N/A		
	TC-99	2.0E-09	0.01%	0.00%	2.6E-09	0.01%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	1.8E-05	100.00%	21.09%	2.3E-05	100.00%	30.09%									

TABLE B.3.3-31
(continued)

Medium	Parameter	Expanded Trespasser User	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
Beef/Milk (Dust Affected)	NP-237	N/A			7.2E-14	0.00%	0.00%	7.2E-14	0.00%	0.00%	5.5E-15	0.00%	0.00%	5.5E-15	0.00%	0.00%	1.1E-12	0.00%	0.00%
	PU-238	N/A			5.4E-16	0.00%	0.00%	5.4E-16	0.00%	0.00%	5.6E-17	0.00%	0.00%	5.6E-17	0.00%	0.00%	8.4E-15	0.00%	0.00%
	PU-239/240	N/A			1.6E-16	0.00%	0.00%	1.6E-16	0.00%	0.00%	1.6E-17	0.00%	0.00%	1.6E-17	0.00%	0.00%	2.4E-15	0.00%	0.00%
	RA-226	N/A			1.5E-10	0.13%	0.00%	1.5E-10	0.13%	0.00%	2.6E-11	0.04%	0.00%	2.6E-11	0.04%	0.00%	2.3E-09	0.13%	0.00%
	RA-228	N/A			1.4E-11	0.01%	0.00%	1.4E-11	0.01%	0.00%	2.4E-12	0.00%	0.00%	2.4E-12	0.00%	0.00%	2.2E-10	0.01%	0.00%
	SR-90	N/A			1.6E-10	0.14%	0.00%	1.6E-10	0.14%	0.00%	3.0E-11	0.05%	0.00%	3.0E-11	0.05%	0.00%	2.5E-09	0.14%	0.00%
	TH-228	N/A			1.1E-13	0.00%	0.00%	1.1E-13	0.00%	0.00%	1.7E-14	0.00%	0.00%	1.7E-14	0.00%	0.00%	1.7E-12	0.00%	0.00%
	TH-230	N/A			1.2E-13	0.00%	0.00%	1.2E-13	0.00%	0.00%	2.0E-14	0.00%	0.00%	2.0E-14	0.00%	0.00%	1.9E-12	0.00%	0.00%
	TH-232	N/A			1.4E-12	0.00%	0.00%	1.4E-12	0.00%	0.00%	2.2E-13	0.00%	0.00%	2.2E-13	0.00%	0.00%	2.1E-11	0.00%	0.00%
	U-234	N/A			1.0E-11	0.01%	0.00%	1.0E-11	0.01%	0.00%	1.9E-12	0.00%	0.00%	1.9E-12	0.00%	0.00%	1.6E-10	0.01%	0.00%
	U-235/236	N/A			7.0E-13	0.00%	0.00%	7.0E-13	0.00%	0.00%	1.3E-13	0.00%	0.00%	1.3E-13	0.00%	0.00%	1.1E-11	0.00%	0.00%
	U-238	N/A			1.8E-11	0.02%	0.00%	1.8E-11	0.02%	0.00%	3.4E-12	0.01%	0.00%	3.4E-12	0.01%	0.00%	2.9E-10	0.02%	0.00%
	Total Radiological Risk				3.5E-10	0.31%	0.00%	3.5E-10	0.31%	0.00%	6.4E-11	0.10%	0.00%	6.4E-11	0.10%	0.00%	5.5E-09	0.30%	0.00%
	Arsenic	N/A			7.4E-09	6.48%	0.01%	7.4E-09	6.48%	0.01%	1.7E-09	2.77%	0.04%	1.7E-09	2.77%	0.04%	1.1E-07	6.33%	0.01%
	Beryllium	N/A			3.6E-10	0.31%	0.00%	3.6E-10	0.31%	0.00%	5.6E-11	0.09%	0.00%	5.6E-11	0.09%	0.00%	5.5E-09	0.30%	0.00%
	Dibenzo(a,h)anthracene	N/A			1.1E-07	92.90%	0.14%	1.1E-07	92.90%	0.14%	6.1E-08	97.04%	1.53%	6.1E-08	97.04%	1.53%	1.7E-06	93.06%	0.12%
	Total Chemical Risk				1.1E-07	99.69%	0.15%	1.1E-07	99.69%	0.15%	6.3E-08	99.90%	1.57%	6.3E-08	99.90%	1.57%	1.8E-06	99.70%	0.12%
	Total				1.1E-07	100.00%	0.15%	1.1E-07	100.00%	0.15%	6.3E-08	100.00%	1.57%	6.3E-08	100.00%	1.57%	1.8E-06	100.00%	0.12%

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TABLE B.3.3-31
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			1.1E-11	1.20%	***0.21%***
	PU-238	N/A			N/A			N/A			N/A			1.3E-11	1.42%	***0.24%***
	PU-239/240	N/A			N/A			N/A			N/A			9.7E-13	0.11%	***0.02%***
	RA-226	N/A			N/A			N/A			N/A			2.1E-11	2.32%	***0.40%***
	RA-228	N/A			N/A			N/A			N/A			2.6E-12	0.29%	***0.05%***
	SR-90	N/A			N/A			N/A			N/A			4.2E-13	0.05%	***0.01%***
	U-234	N/A			N/A			N/A			N/A			1.9E-10	20.69%	***3.55%***
	U-235/236	N/A			N/A			N/A			N/A			1.2E-11	1.29%	***0.22%***
	U-238	N/A			N/A			N/A			N/A			***3.3E-10***	***36.21%***	***6.21%***
	Total Radiological Risk													***5.8E-10***	***63.56%***	***4.69%***
	Arsenic	N/A			N/A			N/A			N/A			3.0E-10	32.47%	***5.57%***
	Beryllium	N/A			N/A			N/A			N/A			3.0E-11	3.24%	***0.56%***
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			6.7E-12	0.74%	***0.13%***
	Total Chemical Risk													3.3E-10	36.45%	***6.25%***
	Total													***9.1E-10***	100.00%	***10.94%***
Beef/Milk (Dust Affected)	NP-237	5.9E-14	0.00%	0.00%	8.3E-14	0.00%	0.00%	N/A			N/A			N/A		
	PU-238	4.3E-16	0.00%	0.00%	8.8E-16	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	1.3E-16	0.00%	0.00%	2.6E-16	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	1.1E-10	0.12%	0.00%	4.1E-10	0.04%	0.00%	N/A			N/A			N/A		
	RA-228	1.0E-11	0.01%	0.00%	3.8E-11	0.00%	0.00%	N/A			N/A			N/A		
	SR-90	1.1E-10	0.12%	0.00%	4.6E-10	0.05%	0.00%	N/A			N/A			N/A		
	TH-228	7.9E-14	0.00%	0.00%	2.6E-13	0.00%	0.00%	N/A			N/A			N/A		
	TH-230	9.3E-14	0.00%	0.00%	3.0E-13	0.00%	0.00%	N/A			N/A			N/A		
	TH-232	1.0E-12	0.00%	0.00%	3.4E-12	0.00%	0.00%	N/A			N/A			N/A		
	U-234	7.4E-12	0.01%	0.00%	2.9E-11	0.00%	0.00%	N/A			N/A			N/A		
	U-235/236	5.1E-13	0.00%	0.00%	2.0E-12	0.00%	0.00%	N/A			N/A			N/A		
	U-238	1.3E-11	0.01%	0.00%	5.2E-11	0.01%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	2.5E-10	0.28%	0.00%	9.9E-10	0.10%	0.00%									
	Arsenic	6.4E-09	6.97%	0.01%	2.7E-08	2.71%	0.03%	N/A			N/A			N/A		
	Beryllium	3.2E-10	0.34%	0.00%	8.7E-10	0.09%	0.00%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	8.5E-08	92.41%	0.10%	9.7E-07	97.11%	1.25%	N/A			N/A			N/A		
	Total Chemical Risk	9.2E-08	99.72%	0.11%	1.0E-06	99.90%	1.29%									
	Total	9.2E-08	100.00%	0.11%	1.0E-06	100.00%	1.29%									

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TABLE B.3.3-31
(continued)

Medium	Parameter	Expanded Trespasser User	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Propert Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Groundwater Affected)	NP-237	N/A			2.8E-12	0.00%	0.00%	2.8E-12	0.00%	0.00%	2.2E-13	7.0E-07%	0.00%	2.2E-13	0.00%	0.00%	1.9E-10	0.00%	0.00%
	PU-238	N/A																	
	PU-239/240	N/A																	
	RA-226	N/A																	
	RA-228	N/A																	
	SR-90	N/A			7.1E-09	0.42%	0.01%	7.1E-09	0.42%	0.01%	1.3E-09	0.43%	0.03%	1.3E-09	0.43%	0.03%	8.6E-08	0.27%	0.01%
	TH-228	N/A																	
	TH-230	N/A																	
	TH-232	N/A																	
	U-234	N/A			5.5E-07	32.42%	0.73%	5.5E-07	32.42%	0.73%	1.0E-07	32.49%	2.52%	1.0E-07	32.49%	2.52%	1.1E-05	33.35%	0.74%
	U-235/236	N/A			2.9E-08	1.73%	0.04%	2.9E-08	1.73%	0.04%	5.4E-09	1.73%	0.13%	5.4E-09	1.73%	0.13%	5.8E-07	1.78%	0.04%
	U-238	N/A			1.1E-06	62.64%	1.42%	1.1E-06	62.64%	1.42%	1.9E-07	62.78%	4.87%	1.9E-07	62.78%	4.87%	2.1E-05	64.33%	1.42%
	TC-99	N/A			4.8E-08	2.80%	0.06%	4.8E-08	2.80%	0.06%	7.9E-09	2.56%	0.20%	7.9E-09	2.56%	0.20%	8.8E-08	0.27%	0.01%
	Total Radiological Risk				1.7E-06	100.00%	2.26%	1.7E-06	100.00%	2.26%	3.1E-07	100.00%	7.75%	3.1E-07	100.00%	7.75%	3.2E-05	100.00%	2.20%
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
Ambient Radon		1.0E-07		0.13%	2.2E-07		0.28%	2.2E-07		0.28%	4.0E-09		0.01%	4.0E-09		0.01%	4.2E-06		5.48%
ALL MEDIA		3.0E-05			7.5E-05			7.5E-05			4.0E-06			4.0E-06			1.5E-03		

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TABLE B.3.3-31
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Resid. User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Groundwater Affected)	NP-237	1.0E-11	0.00%	0.00%	1.5E-11	0.00%	0.00%	N/A			N/A			N/A		
	PU-238							N/A			N/A			N/A		
	PU-239/240							N/A			N/A			N/A		
	RA-226							N/A			N/A			N/A		
	RA-228							N/A			N/A			N/A		
	SR-90	3.9E-09	0.26%	0.00%	1.6E-08	0.27%	0.02%	N/A			N/A			N/A		
	TH-228							N/A			N/A			N/A		
	TH-230							N/A			N/A			N/A		
	TH-232							N/A			N/A			N/A		
	U-234	5.0E-07	33.35%	0.58%	2.0E-06	33.35%	2.54%	N/A			N/A			N/A		
	U-235/236	2.6E-08	1.78%	0.03%	1.0E-07	1.78%	0.14%	N/A			N/A			N/A		
	U-238	9.6E-07	64.33%	1.11%	3.8E-06	64.35%	4.90%	N/A			N/A			N/A		
	TC-99	4.2E-09	0.28%	0.00%	1.5E-08	0.25%	0.02%	N/A			N/A			N/A		
	Total Radiological Risk	1.5E-06	100.00%	1.73%	5.9E-06	100.00%	7.61%							2.4E-11	0.55%	*0.46%*
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			2.4E-13	0.01%	*0.00%*
	PU-238	N/A			N/A			N/A			N/A			1.8E-14	0.00%	*0.00%*
	PU-239/240	N/A			N/A			N/A			N/A			2.6E-10	5.83%	*4.83%*
	RA-226	N/A			N/A			N/A			N/A			2.5E-11	0.56%	*0.46%*
	RA-228	N/A			N/A			N/A			N/A			1.0E-11	0.23%	*0.19%*
	SR-90	N/A			N/A			N/A			N/A			1.4E-09	31.77%	*26.33%*
	U-234	N/A			N/A			N/A			N/A			8.7E-11	1.97%	*1.64%*
	U-235/236	N/A			N/A			N/A			N/A			2.4E-09	55.60%	*46.07%*
	U-238	N/A			N/A			N/A			N/A			4.3E-09	96.52%	*79.98%*
	Total Radiological Risk													5.5E-11	1.24%	*1.03%*
	Arsenic	N/A			N/A			N/A			N/A			1.6E-12	0.04%	*0.03%*
	Beryllium	N/A			N/A			N/A			N/A			9.7E-11	2.20%	*1.82%*
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			1.5E-10	3.48%	*2.88%*
	Total Chemical Risk													4.4E-09	100.00%	*82.86%*
	Total															
Ambient Radon		3.1E-07		0.41%	7.7E-08		0.10%	N/A			N/A			N/A		
ALL MEDIA		8.6E-05			7.7E-05			8.4E-09			3.0E-09			*5.3E-09*		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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TABLE B.3.3-32
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Hazard	% of Receptor Hazard	On-Property Resident Child	% Total Medium Hazard	% of Receptor Hazard	Great Miami River Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Resid. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Soil	Arsenic	N/D			N/D			N/A			N/A			N/A		
	Beryllium	N/D			N/D			N/A			N/A			N/A		
	Total															
Sediment	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Total															
Groundwater	Tributyl phosphate	4.0E-03	0.05%	0.04%	2.0E-02	0.05%	0.03%	N/A			N/A			N/A		
	U-TOTAL	8.2E+00	99.95%	84.05%	4.1E+01	99.95%	62.59%	N/A			N/A			N/A		
	Total	8.3E+00	100.00%	84.09%	4.1E+01	100.00%	62.62%									
Surface Water	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A		
	Total															
GMR Surface Water	Arsenic	N/A			N/A			6.0E-07	31.73%	31.73%	1.5E-06	34.70%	34.70%	N/A		
	Beryllium	N/A			N/A			1.0E-09	0.05%	0.05%	5.4E-09	0.13%	0.13%	N/A		
	U-TOTAL	N/A			N/A			3.0E-07	15.54%	15.54%	1.4E-06	32.58%	32.58%	N/A		
	Cadmium	N/A			N/A			1.0E-06	52.68%	52.68%	1.4E-06	32.58%	32.58%	N/A		
	Total							1.9E-06	100.00%	100.00%	4.2E-06	100.00%	100.00%			
Homegrown Produce (Dust Affected)	Arsenic	2.7E-04	99.64%	0.00%	2.4E-03	99.64%	0.00%	N/A			N/A			N/A		
	Beryllium	9.6E-07	0.36%	0.00%	8.6E-06	0.36%	0.00%	N/A			N/A			N/A		
	Total	2.7E-04	100.00%	0.00%	2.4E-03	100.00%	0.00%									
Homegrown Produce (Groundwater Affected)	Tributyl phosphate	7.2E-04	0.05%	0.01%	1.0E-02	0.05%	0.02%	N/A			N/A			N/A		
	U-TOTAL	1.4E+00	99.95%	14.10%	1.9E+01	99.95%	29.85%	N/A			N/A			N/A		
	Total	1.4E+00	100.00%	14.11%	1.9E+01	100.00%	29.86%									
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A			5.6E-07	2.34%	1.57%
	Beryllium	N/A			N/A			N/A			N/A			1.4E-09	0.01%	0.00%
	Cadmium	N/A			N/A			N/A			N/A			1.9E-05	79.39%	53.04%
	U-TOTAL	N/A			N/A			N/A			N/A			4.4E-06	18.26%	12.19%
	Total													2.4E-05	100.00%	66.80%

TABLE B.3.3-32
(continued)

Medium	Parameter	Expanded Trespasser User	% Total Medium Hazard	% of Receptor Hazard	Off-Property Resident Farmer	% Total Medium Hazard	% of Receptor Hazard	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Hazard	% of Receptor Hazard	Off-Property Res. Child (Priv. Own.)	% Total Medium Hazard	% of Receptor Hazard	Off-Property Res. Child (Fed. Own.)	% Total Medium Hazard	% of Receptor Hazard	On-Property Resident Farmer (RME)	% Total Medium Hazard	% of Receptor Hazard
Beef/Milk	Arsenic	N/A			1.4E-05	99.88%	0.00%	1.4E-05	99.88%	0.00%	3.9E-05	99.92%	0.00%	3.9E-05	99.92%	0.00%	2.2E-04	99.88%	0.00%
(Dust	Beryllium	N/A			1.7E-08	0.12%	0.00%	1.7E-08	0.12%	0.00%	3.0E-08	0.08%	0.00%	3.0E-08	0.08%	0.00%	2.6E-07	0.12%	0.00%
Affected)	*Total*				1.4E-05	100.00%	0.00%	1.4E-05	100.00%	0.00%	3.9E-05	100.00%	0.00%	3.9E-05	100.00%	0.00%	2.2E-04	100.00%	0.00%
Beef/Milk	Tributyl phosphate	N/A															1.0E-06	0.00%	0.00%
(Groundwater	U-TOTAL	N/A			1.5E-02	100.00%	1.28%	1.5E-02	100.00%	1.28%	1.5E-01	100.00%	6.08%	1.5E-01	100.00%	6.08%	4.9E-01	100.00%	2.28%
Affected)		N/A																	
	Total				1.5E-02	100.00%	1.28%	1.5E-02	100.00%	1.28%	1.5E-01	100.00%	6.08%	1.5E-01	100.00%	6.08%	4.9E-01	100.00%	2.28%
Beef/Milk	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
(GMR Surface	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
Water	Cadmium	N/A			N/A			N/A			N/A			N/A			N/A		
Affected)	U-TOTAL	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
ALL MEDIA		*1.3E-01*			1.2E+00			1.2E+00			2.5E+00			2.5E+00			2.2E+01		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - Not determined because toxicity data are not available.

TABLE B.3.3-32
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Hazard	% of Receptor Hazard	On-Property Resident Child	% Total Medium Hazard	% of Receptor Hazard	Great Miami River Rec. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Resid. User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Beef/Milk	Arsenic	9.5E-05	99.88%	0.00%	6.0E-04	99.92%	0.00%	N/A			N/A			N/A		
(Dust	Beryllium	1.1E-07	0.12%	0.00%	4.7E-07	0.08%	0.00%	N/A			N/A			N/A		
Affected)	*Total*	9.5E-05	100.00%	0.00%	6.0E-04	100.00%	0.00%									
Beef/Milk	Tributyl phosphate	4.1E-07	0.00%	0.00%	7.0E-06	0.00%	0.00%	N/A			N/A			N/A		
(Groundwater	U-TOTAL	1.8E-01	100.00%	1.80%	4.9E+00	100.00%	7.51%	N/A			N/A			N/A		
Affected)								N/A			N/A			N/A		
	Total	1.8E-01	100.00%	1.80%	4.9E+00	100.00%	7.51%									
Beef/Milk	Arsenic	N/A			N/A			N/A			N/A			1.0E-07	0.87%	0.29%
(GMR Surface	Beryllium	N/A			N/A			N/A			N/A			7.4E-11	0.00%	0.00%
Water	Cadmium	N/A			N/A			N/A			N/A			1.1E-05	93.65%	31.09%
Affected)	U-TOTAL	N/A			N/A			N/A			N/A			6.5E-07	5.48%	1.82%
	Total													1.2E-05	100.00%	33.20%
ALL MEDIA		9.8E+00			6.5E+01			1.9E-06			4.2E-06			3.6E-05		

N/A signifies that exposure of the receptor to the indicated medium is not applicable
N/D - Not determined because toxicity data are not available.

TABLE B.3.4-1

SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTRATIONS FOR SCENARIOS EVALUATE

Current Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current Access Controls (current use of FEMP continues, DOE ownership)	Trespassing Youth	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
		air	inhalation of particulates, volatiles, gases, and radionuclides	maximum estimated on-subunit current concentration derived from air modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	ingestion dermal contact external radiation	sediment within subunit
	Off-Property Resident Farmer (adult and child), homegrown produce off-property, livestock grazing off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property current concentrations derived from air modeling concentrations
		plants (homegrown produce)	ingestion	maximum estimated off-property current concentrations derived from air modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property current concentrations derived from air modeling results
	Groundskeeper	air	inhalation particulates, volatiles, and gases	maximum estimated on-subunit current concentration derived from air modeling
		surface soil	ingestion dermal contact external radiation	surface soil within subunit

000344

6502

TABLE B.3.4-1
(Continued)

Current Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current with Access Controls (current use of FEMP continues, DOE ownership) (continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruit and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Household User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Current without Access Controls (current use of FEMP continues)	User of Meat and Milk Products		livestock grazing on-property	ingestion of milk and beef	maximum estimated on-property current concentrations derived from air modeling results

0003485

TABLE B.3.4-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from air modeling results
		plants (homegrown produce)	ingestion	maximum estimated off-property future concentrations derived from air modeling, and groundwater modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from air modeling, and groundwater modeling results
		groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations off-site at time when concentration is greatest in the Solid Waste Landfill
	Expanded Trespasser (youth)	air	inhalation particulates, volatiles, and gases	maximum estimated on-subunit airborne concentration derived from air modeling results
		surface water	incidental ingestion dermal contact	surface water within subunit
		sediment	ingestion dermal contact external radiation	sediment within subunit
		surface soil	ingestion dermal contact external radiation	surface soil within subunit

000345

4-6502

TABLE B.3.4-1
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership (Continued)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	estimated concentrations in the Great Miami River
			fish	ingestion	estimated concentrations in the Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruits and vegetables	estimated concentrations in the Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	estimated concentrations in the Great Miami River
		Household User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	estimated concentrations in the Great Miami River
Without Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property		air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from air modeling results
			plants (homegrown produce)	ingestion	maximum estimated off-property future concentrations derived from air modeling, and groundwater modeling results
			livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from air modeling, and groundwater modeling results
			groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations off-site at time when concentration is greatest in the Solid Waste Landfill

TABLE B.3.4-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future On-Property Resident Farmer (adult and child), homegrown produce on-subunit, livestock grazing on-property, groundwater on property, RME and CT estimates	air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-subunit future concentrations from airborne soil modeling results and modeled radon emissions from soil radium
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-subunit future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-subunit future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		groundwater	incidental ingestion dermal contact inhalation	groundwater concentrations underlying Solid Waste Landfill at time when concentration is greatest
	Future On-Property Resident Farmer (adult and child), homegrown produce on-property, livestock grazing on-subunit, groundwater on property; RME and CT estimates (continued)	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
	Future Homebuilder	waste material/subsurface soil	external radiation incidental ingestion dermal contact	subsurface soil within subunit
		air	inhalation of particulates, volatiles, and gases	air concentrations at construction site based on modeling

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A-6507

TABLE B.3.4-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future Perched Groundwater User homegrown produce on-subunit, livestock grazing on-subunit, groundwater on-property (Solid Waste Landfill and Lime Sludge Ponds only)	air	inhalation particulates, volatiles, gases, and indoor radon	maximum estimated on-subunit future concentrations from airborne soil modeling results and modeled radon emissions from soil radium
		plants (home grown produce)	ingestion of fruits and vegetables	maximum estimated on-subunit future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-subunit future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
		maximum modeled perched groundwater directly underlying subunit	ingestion, dermal contact, and inhalation of volatiles released during household use	maximum modeled groundwater concentration in perched groundwater directly underlying Solid Waste Landfill
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit

000379

TABLE B.3.4-3

SOLID WASTE LANDFILL
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Subsurface Soil	Surface Water	Sediment	Perched Water	Groundwater (GMA)
arsenic	antimony	arsenic	neptunium-237	technetium-99	technetium-99
beryllium	arsenic	beryllium	arsenic	carbazole	
lead	beryllium	lead	berylium	2-methylnaphthlene	
neptunium-237	lead	neptunium	radium-226	endosulfan sulfate	
plutonium-238	cesium-137	radium-226	radium-228		
plutonium-239/240	neptunium-237	radium-228	strontium-90		
radium-226	lead-210	strontium-90	uranium-234		
radium-228	plutonium-238	uranium-234	uranium-235/236		
strontium-90	plutonium-239/240	uranium-235/236	uranium-238		
thorium-228	radium-224	uranium-238	uranium-total		
thorium-230	radium-226	uranium-total	benzo(a)anthracene		
thorium-232	radium-228	benzo(g,h,i)peryle	benzo(a)pyrene		
thorium-total	strontium-90	dibenzo(a,h)anthracene	dibenzo(a,h)anthracene		
uranium-234	technetium-99	phenanthrene			
uranium-235/236	thorium-228				
uranium-238	thorium-230				
benzo(a)anthracene	thorium-232				
benzo(a)pyrene	thorium-total				
benzo(b)fluoranthene	uranium-234				
benzo(g,h,i)perylene	uranium-235				
dibenzo(a,h)anthracene	uranium-235/236				
indeno(1,2,3-cd)pyrene	uranium-238				
phenanthrene	uranium-total				
	2-methylnaphthalene				
	benzo(a)anthracene				
	benzo(a)pyrene				

000350

TABLE B.3.4-3
(Continued)

Surface Soil	Subsurface Soil	Surface Water	Sediment	Perched Water	Groundwater (GMA)
	benzo(b)fluoranthene				
	benzo(g,h,i)perylene				
	carbazole				
	dibenzo(a,h)anthracene				
	indeno(1,2,3-cd)pyrene				
	phenanthrene				
	1,4-dioxane				
	heptachlorodibenzo-p-dioxin				
	heptachlorodibenzofuran				
	octachlorodibenzo-p-dioxin				
	Aroclor-1254				
	Aroclor-1260				
	dieldrin				
	endosulfan sulfate				
	endrin aldehyde				

000054

sediment within the subunit; inhalation of airborne particulates; and ingestion and dermal contact with surface water and sediment within the subunit. The exposure point concentrations for exposure to surface soil were based on analytical data, while the inhaled particulate concentrations and surface water and sediment concentrations were based on modeling results as described in the Section B.2.0, Section 5.0 of the RI report, and Appendix A.

Risks and hazards calculated for the trespassing youth on the Solid Waste Landfill are presented in Tables B.3.4-4, B.3.4-5, and B.3.4-6 (Attachment B.III) for exposure to contaminated surface soil, surface water, and sediment, respectively. Total risk for exposure to surface soil was 8.9×10^{-6}. This was primarily due to external radiation exposure to radium-226 (1.8×10^{-6}), radium-228 (1.0×10^{-6} risk) thorium-228 (2.0×10^{-6} risk) and thorium-232 (2.7×10^{-6}) in soil. The risks calculated for all other CPCs were at or below the 1×10^{-7} risk level. Total risk for exposure of a trespassing youth to CPCs in surface water on the Solid Waste Landfill was 4.4×10^{-6}. Total HIs calculated for exposure of a trespassing youth to CPCs in soil, surface water, or sediment on the Solid Waste Landfill were all well below 1.0.

B.3.4.3.2 Current Off-Property Farmers

Risk was characterized for the current off-property farmer and resident child contacting CPCs via inhalation of airborne particulates; and ingestion of airborne particulates deposited on homegrown produce and in milk or beef from livestock grazing on particulates deposited on off-property vegetation. For all of these routes of exposure, the exposure point concentration was based on air modeling results as described in the Section B.2.0, Section 5.0 and Appendix A of the RI report.

Risks and hazards calculated for the off-property farmer and resident child exposed to CPCs in airborne soil particulates from the Solid Waste Landfill are presented in Tables B.3.4-7(a) and B.3.4-7(b), respectively (Attachment B.III). The total risk was 3.3×10^{-8} and 6.2×10^{-10} for the farmer and resident child, respectively. The total hazard for both the farmer and child was well below 1.0.

Risks and hazards associated with ingestion of CPCs in beef and milk for the current off-property farmer and resident child are given in Tables B.3.4-8(a) and B.3.4-8(b), respectively (Attachment B.III). Total risk for all CPCs consumed in beef and milk was 2.5×10^{-9} and 1.3×10^{-9} for the

farmer and child, respectively. The total HIs for all CPCs consumed in beef and milk was well below 1.0 for both the farmer and child.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property resident farmer and child are given in Tables B.3.4-9(a) and B.3.4-9(b), respectively (Attachment B.III). The total risk for all CPCs consumed in homegrown produce was 1.4×10^{-9} and 3.7×10^{-10} for the farmer and child, respectively. The total HI for all CPCs consumed in homegrown produce was well below 1.0 for both the farmer and child.

B.3.4.3.3 Current User of Milk/Meat Products

Risk was characterized for a current user of milk and meat products from livestock potentially grazing within the Solid Waste Landfill boundaries. Exposure point concentrations in meat and milk were derived from the maximum on-property current deposition rates of airborne Solid Waste Landfill surface soil. Risk and hazard to the current user of meat and milk products is given in Table B.3.4-10 (Attachment B.III). Total risk was less than 1.0×10^{-6} and total HI was well below 1.0.

B.3.4.3.4 Current Groundskeeper

Risks and hazards to the current groundskeeper are given in Table 3.4-11 (Attachment B.III). Total carcinogenic risk from surface soil exposure was 3.3×10^{-5} due mostly to external radiation from radium-226 (6.8×10^{-6}, radium-228 3.9×10^{-6}, thorium-232 (1.0×10^{-5}), thorium-228 7.3×10^{-6}), and uranium-238 (2.6×10^{-6}). The total HI was less than 1.0.

B.3.4.4 Risk Characterization for Future Land Use

The future scenarios characterized for the Solid Waste Landfill assuming continued federal ownership are the off-property farmer and resident child and an expanded trespasser. Future scenarios characterized for the Solid Waste Landfill assuming private ownership are an on-property farmer and resident child living on and farming the Solid Waste Landfill; a future home builder; a future perched groundwater user. Users of the Great Miami River were evaluated assuming federal and private ownerships.

B.3.4.4.1 Future Off-Property Farmers

For the off-property farmer and resident child private ownership and federal ownership, risks were calculated for exposure to CPCs in airborne soil. Receptors were presumed to contact CPCs in air

via inhalation of airborne particulates; by consumption of homegrown produce on which airborne soil was deposited and that was watered with contaminated groundwater; by ingestion of milk and beef from cattle grazing on vegetation on which airborne soil was deposited and that consumed contaminated groundwater; and by ingestion, dermal contact, and inhalation of contaminated groundwater. All of the exposure point concentrations for this scenario were derived from air and groundwater modeling results as described in Section B.2.0, Methodology and Section 5.0 and Appendix A of the RI report.

Risks and hazards calculated for the future off-property farmer and resident child private and federal ownership exposed to CPCs in soil and airborne contaminants from the Solid Waste Landfill are given in Tables B.3.4-12(a) B.3.4-12(b), B.3.4-12(c), and B.3.4-13(d), respectively (Attachment B.III). The total risk from soil was 1.0×10^{-6} (private ownership) and 3.3×10^{-8} (federal ownership) for the farmer. For the child, private and federal ownership, risks were 1.9×10^{-8} and 6.2×10^{-10}, respectively. The risks associated with any individual CPC was at or below the 1×10^{-7} risk level. The total HIs for both the farmer and child were well below 1.0.

Risks and hazards associated with ingestion of CPCs in beef and milk for the off-property farmer and resident child (private and federal ownership) are given in Tables B.3.4-13(a) B.3.4-13(b), B.3.4-13(c), and B.3.4-13(d) respectively (Attachment B.III). The total risk for all CPCs consumed in beef and milk was below the threshold value of 1.0×10^{-6}) for the farmer and child (private, and federal ownership), respectively. The total HIs for all CPCs consumed in beef and milk were well below 1.0 for both the farmer and child (private and federal ownership).

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property farmer and resident child (private and federal ownership) are given in Tables B.3.4-14(a) B.3.4-14(b), B.3.4-14(c), and B.3.4-14(d) respectively (Attachment B.III). The total risk for all CPCs consumed in homegrown produce was were below the 1.0×10^{-6} threshold value for the farmer and child (private and federal ownership). Under continued federal ownership, the total risk for all CPCs for the off-property farmer and resident child were 1.4×10^{-9} and 3.7×10^{-10}, respectively. The total HIs for all CPCs consumed in homegrown produce were well below 1.0 for both the farmer and child (private and federal ownership).

The risks and hazards associated with exposure of the off-property farmer and resident child (private and federal ownership) to groundwater are given in Tables B.3.4-15(a), B.3.4-15(b), B.3.4-15(c), and B.3.4-15(d) respectively (Attachment B.III). No risks exceeded 1.0×10^{-6} and total HIs were below 1.0.

B.3.4.4.2 Future Expanded Trespasser

The expanded trespasser was assumed to contact CPCs directly via inhalation of airborne particulates of soil; ingestion and dermal contact with sediment and surface water; ingestion and dermal contact with surface soil; and external radiation resulting from exposure to contaminated surface soil and sediment. The exposure point concentrations for inhalation of airborne particles, surface water and sediment were estimated from modeling results while surface soil exposure point concentrations were derived from analytical data.

Risks and hazards calculated for the future expanded trespasser due to CPCs in surface soil at the Solid Waste Landfill are presented in Table B.3.4-17 (Attachment B.III). The total risk due to exposure to all CPCs in soil by all exposure pathways was 1.9×10^{-5}. This was primarily due to external radiation by radium-226 (3.8×10^{-6}), radium-228 (2.2×10^{-6}), thorium-228 (4.1×10^{-6}), thorium-232 (5.8×10^{-6}), and uranium-238 (1.4×10^{-6}).

Total risk due to exposure to all CPCs in surface water (Table 3.4-18(a), Attachment B.III) did not exceed the 1.0×10^{-6} risk level. Total risk due to sediment (Table 3.4-18(b), Attachment B.III) slightly exceeded the 1.0×10^{-6} level due to cumulative risk of all CPCs in sediment. All HIs were below 1.0.

B.3.4.4.3 Future On-Property Farmers

Risks were quantified for the future on-site farmer and resident child living on the Solid Waste Landfill, assuming livestock would be grazing on the landfill and both humans and livestock would be using groundwater underlying the Solid Waste Landfill. Risks were calculated for inhalation of airborne particulates estimated from modeled results as described in Section B.2, and Appendix A, and Section 5.0 of this RI report; and for direct contact with soil via ingestion, external radiation, and dermal contact. Risks were estimated for ingestion of homegrown produce on which contaminated soil was deposited and which was irrigated with groundwater underlying the Solid Waste Landfill; and for ingestion of milk and beef from livestock consuming on-property vegetation on which airborne

soil was deposited and drinking groundwater underlying the Solid Waste Landfill. Risks associated with ingestion, dermal contact, and inhalation of contaminants in groundwater underlying the Solid Waste Landfill were also assessed. Exposure point concentrations for these routes of exposure were based on air and groundwater modeling results. Both RME and CT risks and hazards were estimated for the on-property farmer.

Risks and hazards for the RME Solid Waste Landfill on-property farmer and resident child exposed to CPCs in surface soil and in airborne particulates are given in Tables B.3.4-19(a) and B.3.4-19(b), respectively (Attachment B.III). The total risks for the on-property farmer and resident child were 1.8×10^{-3} and 1.6×10^{-4}, respectively. Risk from soil for RME farmer was due primarily to radium-226 (3.5×10^{-4}), radium-228 (2.0×10^{-4}) thorium-228 (3.8×10^{-4}), thorium-232 (5.4×10^{-4}) and uranium-238 (1.7×10^{-4}). additional CPCs contributory to surface soil risk greater than 10^{-6} are presented in Table B.3.4-19(a).

Risks and hazards associated with exposure to contaminants in groundwater for the RME on-property farmer and resident child are given in Tables B.3.4-20(a) and B.3.4-20(b), respectively (Attachment B.III). The risk to the farmer and child was 3.9×10^{-8} and 1.7×10^{-9}, respectively. HIs were well below 1.0 for both receptors.

Risks and hazards associated with exposure to contaminants in homegrown produce for the RME farmer and resident child are given in Tables B.3.4-21(a) and B.3.4-21(b), respectively (Attachment B.III). The risk associated with homegrown produce for the RME farmer was 1.2×10^{-4} and for the child was 3.1×10^{-5}. This was due primarily to the estimated presence of arsenic (5.1×10^{-5}), benzo(a) anthracene (4.0×10^{-6}), benzo(a)pyrene (2.1×10^{-5}), benzo(b)fluoranthene (4.2×10^{-6}), and dibenzo(a,h)anthracene 4.5×10^{-6} in fruits and vegetable ingestion. HIs were less than 1.0.

Risks and hazards associated with exposure to contaminants in beef and milk for the RME farmer and resident child are given in Table B.3.4-22(a) and B.3.4-22(b), respectively (Attachment B.III). The risk associated with beef and milk for the adult farmer was 8.7×10^{-4} and for the child was 4.5×10^{-4}. This is largely due to the estimated uptake of benzo(a)pyrene (2.0×10^{-4}), benzo(b)fluoranthene (4.2×10^{-5}), dibenzo(a,h)anthracene (4.2×10^{-4}), and the indeno (1,2,3-cd)pyrene (6.2×10^{-5}). HIs were below 1.0 for both receptors.

CT estimates of risk and hazard for the future on-property farmer associated with exposures to surface soil, groundwater, homegrown produce, and beef and milk, are given in Tables B.3.4-23, B.3.4-24, B.3.4-25 and B.3.4-26, respectively (Attachment B.III). Risks exceeding 1.0×10^{-6} were associated with exposures to surface soil primarily due to inhalation of uranium-238. Risks due to soil ingestion were due primarily to radium-226, uranium-234, and uranium 238. External radiation risks were due primarily to neptunium-237, radium-226, radium-228, thorium-228, thorium-232, uranium 235/236, and uranium-238. HIs were less than 1.0.

B.3.4.4.4 Future On-Property Solid Waste Landfill Homebuilder

Risks and hazards for an on-property homebuilder exposed to contaminated subsurface and surface soils while building a home on the Solid Waste Landfill are given in Table B.3.4-27 (Attachment B.III). Total risk due to all CPCs by all routes of exposure was 9.0×10^{-6}. Risks were due primarily to external radiation exposure from radium-226 (1.2×10^{-6}), thorium-228 (2.3×10^{-6}), and thorium-232 (3.7×10^{-6}). Chemical risks were primarily via dermal contact with soil containing benzo(a)pyrene (5.6×10^{-6}). HIs were less than 1.0. Total HI for the homebuilder on the Solid Waste Landfill was below 1.0.

B.3.4.4.5 Future On-Property Perched Groundwater User

Risks were calculated for a future on-property resident ingesting, dermally contacting, or inhaling contaminants predicted to be present in perched groundwater directly underlying the Solid Waste Landfill. Risks were calculated for inhalation of airborne particulates estimated from air modeling results of the Solid Waste Landfill; ingest of homegrown produce on which airborne surface soil was deposited and which was irrigated with contaminated perched water; and ingestion of milk and beef from livestock consuming vegetation on which airborne surface soil was deposited and drinking contaminated perched water directly underlying the Solid Waste Landfill. Risks and hazards to the perched groundwater user due to exposures to perched groundwater are given in Tables B.3.4-28(a) and B.3.4-28(b), respectively, (Attachment B.III). Total risk from perched water was 7.1×10^{-6} due to the estimated presence of technetium-99 (1.8×10^{-6}) and carbazole (5.3×10^{-6})in perched groundwater.

B.3.4.4.6 Future Users of Great Miami River

Risk and hazards to the users of the Great Miami River were determined under three exclusive users: recreational, agricultural, and residential. Risks and hazards to the recreational user of the Great

Miami River exposed to CPCs in surface water are presented in Table B.3.4-29(a) (Attachment III). Total risk to this receptor is 2.8×10^{-10}. Total hazard was less than 1.0. Risk and hazards to the agricultural user of the Great Miami River are present in Tables B.3.4-29(b) and B.3.4-29(d) (Attachment III). Total risk to this receptor was 6.5×10^{-7}. Total HI was below 1.0. Risks and hazards to the residential user of the Great Miami River are presented in Table B.3.4-29(c). Total risk to this receptor was 4.2×10^{-9}. Total HI for this receptor was below 1.0.

B.3.4.4.7 Results of Modeled Indoor Air Radon Concentrations: Solid Waste Landfill

Ambient radon emission potentially associated with the Solid Waste Landfill, estimated as described in Section B.2.0, are summarized in Table B.3.4-31(a) for each receptor. Risks that would result at the Solid Waste Landfill, assuming radon emissions were equivalent to what would naturally occur if radium-226 were present at background concentrations, are presented for comparison. With the exception of the future on-property RME farmer, all subunit-specific risks are within or close to background.

Concentrations of indoor radon were estimated from Solid Waste Landfill subsurface soil radium-226 concentrations as described in Attachment B.II. The results shown in Table B.3.4-31(b) demonstrate little difference exists between potential carcinogenic risk to future residents dwelling either in a house constructed on a slab-type foundation or a house built with a basement. The future risk to the child resident of a house with slab foundation is 2.6×10^{-4}, with 3.1×10^{-4} risk to the CT resident, and 3.0×10^{-3} risk to an RME resident. The house with basement would present risks of 1.9×10^{-4} to the child, 2.3×10^{-4} to the CT resident, and 2.3×10^{-3} risks to an RME resident. Unlike the South Field indoor radon scenario, essentially no difference exists between the type of foundation constructed on the Solid Waste Landfill (see Table B.3.2.4.3-13, Attachment B.III). For comparisons, the risk to an RME resident exposed to the EPA action level for radon (4 pCi/L) (ASTDR 1990f) is presented. The risk would be 1.1×10^{-2}.

B.3.4.5 Summary for Solid Waste Landfill

Tables B.3.4-30 and B.3.4-31 summarize risk and hazard, respectively, associated with the Solid Waste Landfill for receptors assuming current land use. Exposure of the trespassing youth and groundskeeper were the only receptors in the current scenario associated with carcinogenic risks greater than 1.0×10^{-6}. Total carcinogenic risk to the trespassing youth was 1.5×10^{-5} due primarily

TABLE B.3.4-30
CURRENT LAND USE
SOLID WASTE LANDFILL
SUMMARY OF CARCINOGENIC RISK

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	NP-237	1.1E-07	1.27%	0.77%	2.0E-10	0.59%	0.33%	3.6E-12	0.57%	0.13%
	PU-238	2.2E-09	0.02%	0.02%	1.7E-10	0.52%	0.28%	3.1E-12	0.50%	0.12%
	PU-239/240	2.4E-10	0.00%	0.00%	1.8E-11	0.05%	0.03%	3.2E-13	0.05%	0.01%
	RA-226	1.8E-06	20.33%	12.31%	5.6E-11	0.17%	0.09%	1.0E-12	0.16%	0.04%
	RA-228	1.0E-06	11.73%	7.10%	6.6E-12	0.02%	0.01%	1.2E-13	0.02%	0.00%
	SR-90	4.1E-10	0.00%	0.00%	3.4E-13	0.00%	0.00%	6.1E-15	0.00%	0.00%
	TH-228	2.0E-06	21.96%	13.30%	7.3E-10	2.19%	1.20%	1.3E-11	2.11%	0.49%
	TH-230	2.2E-09	0.03%	0.02%	1.1E-09	3.24%	1.77%	1.9E-11	3.12%	0.72%
	TH-232	2.7E-06	30.89%	18.71%	9.5E-10	2.87%	1.57%	1.7E-11	2.76%	0.64%
	U-234	1.5E-08	0.17%	0.10%	6.3E-09	18.88%	10.34%	1.1E-10	18.18%	4.20%
	U-235/236	1.5E-07	1.65%	1.00%	4.1E-10	1.22%	0.67%	7.4E-12	1.18%	0.27%
	U-238	6.4E-07	7.25%	4.39%	2.3E-08	69.18%	37.88%	4.2E-10	66.59%	15.38%
	Total Radiological Risk	8.5E-06	95.31%	57.72%	3.3E-08	98.94%	54.17%	6.0E-10	95.23%	22.00%
	Arsenic	1.6E-07	1.75%	1.06%	3.2E-10	0.96%	0.53%	2.7E-11	4.33%	1.00%
	Benzo(a)anthracene	8.7E-09	0.10%	0.06%	7.2E-13	0.00%	0.00%	6.0E-14	0.01%	0.00%
	Benzo(a)pyrene	8.0E-08	0.90%	0.55%	6.6E-12	0.02%	0.01%	5.6E-13	0.09%	0.02%
	Benzo(b)fluoranthene	1.7E-08	0.19%	0.11%	1.4E-12	0.00%	0.00%	1.2E-13	0.02%	0.00%
	Beryllium	9.7E-08	1.09%	0.66%	1.9E-11	0.06%	0.03%	1.6E-12	0.25%	0.06%
	Dibenzo(a,h)anthracene	4.7E-08	0.53%	0.32%	3.9E-12	0.01%	0.01%	3.3E-13	0.05%	0.01%
	Indeno(1,2,3-cd)pyrene	1.1E-08	0.13%	0.08%	9.4E-13	0.00%	0.00%	7.9E-14	0.01%	0.00%
	Total Chemical Risk	4.2E-07	4.69%	2.84%	3.5E-10	1.06%	0.58%	3.0E-11	4.77%	1.10%
	Total	8.9E-06	100.00%	60.56%	3.3E-08	100.00%	54.75%	6.2E-10	100.00%	23.10%
Surface Water	NP-237	2.5E-09	0.06%	0.02%	N/A			N/A		
	RA-226	8.3E-10	0.02%	0.01%	N/A			N/A		
	RA-228	1.3E-10	0.00%	0.00%	N/A			N/A		
	SR-90	1.8E-09	0.04%	0.01%	N/A			N/A		
	U-234	4.8E-09	0.11%	0.03%	N/A			N/A		
	U-235/236	3.2E-10	0.01%	0.00%	N/A			N/A		
	U-238	1.5E-08	0.35%	0.10%	N/A			N/A		
	Total Radiological Risk	2.6E-08	0.58%	0.17%						
	Arsenic	4.4E-06	99.35%	29.77%	N/A			N/A		
	Benzo(a)anthracene	9.8E-11	0.00%	0.00%	N/A			N/A		
	Benzo(a)pyrene	3.8E-10	0.01%	0.00%	N/A			N/A		
	Beryllium	2.2E-09	0.05%	0.02%	N/A			N/A		
	Dibenzo(a,h)anthracene	2.3E-10	0.01%	0.00%	N/A			N/A		
	Total Chemical Risk	4.4E-06	99.42%	29.79%						
	Total	4.4E-06	100.00%	29.96%						

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TABLE B.3.4-30
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	NP-237	N/A			4.3E-07	1.30%	1.29%	N/A			N/A			N/A		
	PU-238	N/A			1.6E-08	0.05%	0.05%	N/A			N/A			N/A		
	PU-239/240	N/A			1.8E-09	0.01%	0.01%	N/A			N/A			N/A		
	RA-226	N/A			6.8E-06	20.34%	20.21%	N/A			N/A			N/A		
	RA-228	N/A			3.9E-06	11.67%	11.60%	N/A			N/A			N/A		
	SR-90	N/A			3.0E-09	0.01%	0.01%	N/A			N/A			N/A		
	TH-228	N/A			7.3E-06	21.83%	21.69%	N/A			N/A			N/A		
	TH-230	N/A			1.7E-08	0.05%	0.05%	N/A			N/A			N/A		
	TH-232	N/A			1.0E-05	30.73%	30.54%	N/A			N/A			N/A		
	U-234	N/A			1.2E-07	0.35%	0.35%	N/A			N/A			N/A		
	U-235/236	N/A			5.5E-07	1.65%	1.64%	N/A			N/A			N/A		
	U-238	N/A			2.6E-06	7.83%	7.78%	N/A			N/A			N/A		
	Total Radiological Risk				3.2E-05	95.82%	95.21%									
	Arsenic	N/A			6.1E-07	1.82%	1.81%	N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			2.6E-08	0.08%	0.08%	N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			2.4E-07	0.73%	0.72%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			5.1E-08	0.15%	0.15%	N/A			N/A			N/A		
	Beryllium	N/A			2.9E-07	0.88%	0.87%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			1.4E-07	0.43%	0.42%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	N/A			3.4E-08	0.10%	0.10%	N/A			N/A			N/A		
	Total Chemical Risk				1.4E-06	4.18%	4.15%									
	Total				3.3E-05	100.00%	99.36%									
Surface Water	NP-237	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															

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TABLE B.3.4-30
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
GMR Surface Water	NP-237	N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A		
	U-234	N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A		
	U-238	N/A			N/A			N/A		
	Total Radiological Risk									
	Arsenic	N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A		
	Total Chemical Risk									
	Total									
Sediment	NP-237	3.7E-08	2.74%	0.26%	N/A			N/A		
	RA-226	6.0E-07	43.80%	4.07%	N/A			N/A		
	RA-228	3.5E-07	25.46%	2.37%	N/A			N/A		
	SR-90	1.3E-10	0.01%	0.00%	N/A			N/A		
	U-234	2.6E-09	0.19%	0.02%	N/A			N/A		
	U-235/236	4.9E-08	3.56%	0.33%	N/A			N/A		
	U-238	2.1E-07	15.11%	1.41%	N/A			N/A		
	Total Radiological Risk	1.2E-06	90.87%	8.45%						
	Arsenic	7.6E-08	5.53%	0.51%	N/A			N/A		
	Benzo(a)anthracene	1.8E-09	0.13%	0.01%	N/A			N/A		
	Benzo(a)pyrene	1.7E-08	1.24%	0.12%	N/A			N/A		
	Beryllium	2.0E-08	1.50%	0.14%	N/A			N/A		
	Dibenz(a,h)anthracene	1.0E-08	0.73%	0.07%	N/A			N/A		
	Total Chemical Risk	1.2E-07	9.13%	0.85%						
	Total	1.4E-06	100.00%	9.30%						
Homegrown Produce (Dust Affected)	NP-237	N/A			2.2E-11	1.56%	0.04%	1.6E-12	0.43%	0.06%
	PU-238	N/A			1.2E-11	0.86%	0.02%	8.7E-13	0.24%	0.03%
	PU-239/240	N/A			1.4E-12	0.10%	0.00%	9.8E-14	0.03%	0.00%
	RA-226	N/A			9.7E-11	6.75%	0.16%	6.9E-12	1.85%	0.25%
	RA-228	N/A			4.2E-12	0.29%	0.01%	8.6E-13	0.23%	0.03%
	SR-90	N/A			4.2E-12	0.29%	0.01%	2.9E-13	0.08%	0.01%
	TH-228	N/A			6.4E-12	0.45%	0.01%	4.5E-13	0.12%	0.02%
	TH-230	N/A			6.3E-12	0.44%	0.01%	4.4E-13	0.12%	0.02%
	TH-232	N/A			1.9E-11	1.33%	0.03%	1.4E-12	0.37%	0.05%
	U-234	N/A			5.4E-11	3.74%	0.09%	3.8E-12	1.03%	0.14%
	U-235/236	N/A			3.6E-12	0.25%	0.01%	2.6E-13	0.07%	0.01%
	U-238	N/A			1.7E-10	11.98%	0.28%	1.2E-11	3.29%	0.45%
	Total Radiological Risk				4.0E-10	28.04%	0.67%	2.9E-11	7.85%	1.07%

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TABLE B.3.4-30
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
GMR Surface Water	NP-237	N/A			N/A			6.6E-13	0.23%	0.23%	1.6E-11	0.39%	0.39%	N/A		
	RA-226	N/A			N/A			1.1E-12	0.38%	0.38%	5.3E-12	0.13%	0.13%	N/A		
	RA-228	N/A			N/A			1.7E-13	0.06%	0.06%	8.2E-13	0.02%	0.02%	N/A		
	SR-90	N/A			N/A			1.4E-12	0.50%	0.50%	1.2E-11	0.28%	0.28%	N/A		
	U-234	N/A			N/A			2.6E-12	0.93%	0.93%	3.0E-10	7.32%	7.32%	N/A		
	U-235/236	N/A			N/A			1.8E-14	0.01%	0.01%	2.0E-12	0.05%	0.05%	N/A		
	U-238	N/A			N/A			8.4E-13	0.30%	0.30%	9.8E-11	2.35%	2.35%	N/A		
	Total Radiological Risk							6.8E-12	2.41%	2.4E-02	4.4E-10	10.53%	1.1E-01			
	Arsenic	N/A			N/A			2.0E-11	7.00%	7.00%	3.7E-09	88.31%	88.31%	N/A		
	Benzo(a)anthracene	N/A			N/A			9.2E-12	3.25%	3.25%	9.9E-13	0.02%	0.02%	N/A		
	Benzo(a)pyrene	N/A			N/A			7.7E-11	27.36%	27.36%	3.9E-12	0.09%	0.09%	N/A		
	Beryllium	N/A			N/A			3.4E-13	0.12%	0.12%	4.1E-11	0.98%	0.98%	N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			1.7E-10	59.86%	59.86%	2.3E-12	0.06%	0.06%	N/A		
	Total Chemical Risk							2.8E-10	97.59%	9.8E-01	3.7E-09	89.47%	8.9E-01			
	Total							2.8E-10	100.00%	100.00%	4.2E-09	100.00%	100.00%			
Sediment	NP-237	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Dibenz(a,h)anthracene	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															
Homegrown Produce (Dust Affected)	NP-237	N/A			N/A			N/A			N/A			N/A		
	PU-238	N/A			N/A			N/A			N/A			N/A		
	PU-239/240	N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	TH-228	N/A			N/A			N/A			N/A			N/A		
	TH-230	N/A			N/A			N/A			N/A			N/A		
	TH-232	N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															

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TABLE B.3.4-30
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected) *(continued)*	Arsenic	N/A			6.6E-10	45.71%	1.09%	2.2E-10	58.55%	8.01%
	Benzo(a)anthracene	N/A			1.2E-11	0.81%	0.02%	3.8E-12	1.04%	0.14%
	Benzo(a)pyrene	N/A			1.1E-10	7.30%	0.17%	3.5E-11	9.34%	1.28%
	Benzo(b)fluoranthene	N/A			2.2E-11	1.51%	0.04%	7.2E-12	1.93%	0.26%
	Beryllium	N/A			1.6E-10	11.41%	0.27%	5.4E-11	14.62%	2.00%
	Dibenzo(a,h)anthracene	N/A			6.1E-11	4.21%	0.10%	2.0E-11	5.38%	0.74%
	Indeno(1,2,3-cd)pyrene	N/A			1.5E-11	1.01%	0.02%	4.8E-12	1.29%	0.18%
	Total Chemical Risk				1.0E-09	71.96%	1.71%	3.4E-10	92.15%	12.61%
	Total				1.4E-09	100.00%	2.38%	3.7E-10	100.00%	13.68%
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A		
	U-234	N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A		
	U-238	N/A			N/A			N/A		
	Total Radiological Risk									
	Arsenic	N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A		
	Total Chemical Risk	N/A			N/A			N/A		
	Total									
Beef/Milk (Dust Affected)	NP-237	N/A			2.8E-13	0.01%	0.00%	2.1E-14	0.00%	0.00%
	PU-238	N/A			9.2E-16	0.00%	0.00%	9.6E-17	0.00%	0.00%
	PU-239/240	N/A			2.9E-16	0.00%	0.00%	3.1E-17	0.00%	0.00%
	RA-226	N/A			5.2E-11	2.05%	0.09%	9.0E-12	0.70%	0.33%
	RA-228	N/A			1.4E-12	0.06%	0.00%	2.5E-13	0.02%	0.01%
	SR-90	N/A			8.3E-12	0.33%	0.01%	1.5E-12	0.12%	0.06%
	TH-228	N/A			8.7E-15	0.00%	0.00%	1.4E-15	0.00%	0.00%
	TH-230	N/A			4.6E-14	0.00%	0.00%	7.2E-15	0.00%	0.00%
	TH-232	N/A			1.4E-13	0.01%	0.00%	2.2E-14	0.00%	0.00%
	U-234	N/A			1.1E-11	0.43%	0.02%	2.0E-12	0.15%	0.07%
	U-235/236	N/A			7.3E-13	0.03%	0.00%	1.3E-13	0.01%	0.00%
	U-238	N/A			3.5E-11	1.39%	0.06%	6.4E-12	0.50%	0.24%
	Total Radiological Risk				1.1E-10	4.31%	0.18%	1.9E-11	1.51%	0.72%
	Arsenic	N/A			3.0E-10	11.95%	0.50%	7.1E-11	5.51%	2.62%
	Benzo(a)anthracene	N/A			1.7E-11	0.68%	0.03%	9.9E-12	0.77%	0.37%
	Benzo(a)pyrene	N/A			4.2E-10	16.79%	0.70%	2.4E-10	18.95%	9.00%
	Benzo(b)fluoranthene	N/A			9.1E-11	3.60%	0.15%	5.2E-11	4.06%	1.93%
	Beryllium	N/A			4.7E-11	1.85%	0.08%	7.3E-12	0.57%	0.27%
	Dibenzo(a,h)anthracene	N/A			1.4E-09	53.84%	2.24%	7.8E-10	60.74%	28.85%
	Indeno(1,2,3-cd)pyrene	N/A			1.8E-10	6.98%	0.29%	1.0E-10	7.87%	3.74%
	Total Chemical Risk				2.4E-09	95.69%	3.98%	1.3E-09	98.49%	46.78%
	Total				2.5E-09	100.00%	4.16%	1.3E-09	100.00%	47.50%

TABLE B.3.4-30
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Groundskeeper	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected) *(continued)*	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			1.1E-09	3.03%	0.17%
	RA-226	N/A			N/A			N/A			N/A			4.5E-10	1.24%	0.07%
	RA-228	N/A			N/A			N/A			N/A			1.5E-12	0.00%	0.00%
	SR-90	N/A			N/A			N/A			N/A			2.9E-09	7.97%	0.44%
	U-234	N/A			N/A			N/A			N/A			1.1E-08	31.15%	1.73%
	U-235/236	N/A			N/A			N/A			N/A			7.6E-11	0.21%	0.01%
	U-238	N/A			N/A			N/A			N/A			3.6E-09	10.00%	0.55%
	Total Radiological Risk													1.9E-08	53.59%	3.0E-02
	Arsenic	N/A			N/A			N/A			N/A			1.6E-08	44.77%	2.48%
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			5.7E-12	0.02%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			1.2E-11	0.03%	0.00%
	Beryllium	N/A			N/A			N/A			N/A			5.7E-10	1.57%	0.09%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			3.8E-12	0.01%	0.00%
	Total Chemical Risk	N/A			N/A			N/A			N/A			1.7E-08	46.41%	2.6E-02
	Total													3.6E-08	100.00%	5.5E-02
Beef/Milk (Dust Affected)	NP-237	1.7E-11	0.19%	0.19%	N/A			N/A			N/A			N/A		
	PU-238	5.6E-14	0.00%	0.00%	N/A			N/A			N/A			N/A		
	PU-239/240	1.8E-14	0.00%	0.00%	N/A			N/A			N/A			N/A		
	RA-226	3.2E-09	35.08%	35.08%	N/A			N/A			N/A			N/A		
	RA-228	8.7E-11	0.97%	0.97%	N/A			N/A			N/A			N/A		
	SR-90	5.0E-10	5.58%	5.58%	N/A			N/A			N/A			N/A		
	TH-228	5.3E-13	0.01%	0.01%	N/A			N/A			N/A			N/A		
	TH-230	2.8E-12	0.03%	0.03%	N/A			N/A			N/A			N/A		
	TH-232	8.5E-12	0.09%	0.09%	N/A			N/A			N/A			N/A		
	U-234	6.6E-10	7.33%	7.33%	N/A			N/A			N/A			N/A		
	U-235/236	4.5E-11	0.49%	0.49%	N/A			N/A			N/A			N/A		
	U-238	2.1E-09	23.51%	23.51%	N/A			N/A			N/A			N/A		
	Total Radiological Risk	6.6E-09	73.28%	73.28%												
	Arsenic	3.0E-10	3.34%	3.34%	N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	1.7E-11	0.19%	0.19%	N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	4.2E-10	4.69%	4.69%	N/A			N/A			N/A			N/A		
	Benzo(b)fluoranthene	9.1E-11	1.01%	1.01%	N/A			N/A			N/A			N/A		
	Beryllium	4.7E-11	0.52%	0.52%	N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	1.4E-09	15.03%	15.03%	N/A			N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	1.8E-10	1.95%	1.95%	N/A			N/A			N/A			N/A		
	Total Chemical Risk	2.4E-09	26.72%	26.72%												
	Total	9.0E-09	100.00%	100.00%												

0000384

6502

TABLE B.3.4-30
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A		
	U-234	N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A		
	U-238	N/A			N/A			N/A		
	Total Radiological Risk									
	Arsenic	N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A		
	Total Chemical Risk									
	Total									
Ambient Radon		2.6E-08		0.17%	2.3E-08		38.72%	4.3E-10		15.72%
ALL MEDIA		**1.5E-05**			**6.1E-08**			**2.7E-09**		

000365

TABLE B.3.4-30
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Grounds-keeper	% Total Medium Risk	% Total Receptor Risk	Great iami Riv Rec User	% Total Medium Risk	% Total Receptor Risk	Great iami Riv Res User	% Total Medium Risk	% Total Receptor Risk	Great iami Riv Ag. User	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			2.2E-08	3.50%	3.31%
	RA-226	N/A			N/A			N/A			N/A			4.0E-08	6.54%	6.18%
	RA-228	N/A			N/A			N/A			N/A			1.1E-10	0.02%	0.02%
	SR-90	N/A			N/A			N/A			N/A			3.1E-07	51.12%	48.28%
	U-234	N/A			N/A			N/A			N/A			1.7E-07	28.15%	26.59%
	U-235/236	N/A			N/A			N/A			N/A			1.2E-09	0.19%	0.18%
	U-238	N/A			N/A			N/A			N/A			5.6E-08	9.04%	8.54%
	Total Radiological Risk													6.1E-07	98.56%	93.09%
	Arsenic	N/A			N/A			N/A			N/A			8.7E-09	1.41%	1.33%
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			5.2E-12	0.00%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			3.1E-11	0.01%	0.00%
	Beryllium	N/A			N/A			N/A			N/A			1.4E-10	0.02%	0.02%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			5.3E-11	0.01%	0.01%
	Total Chemical Risk													8.9E-09	1.44%	1.36%
	Total													6.2E-07	100.00%	94.46%
Ambient Radon		N/A			2.2E-07		0.64%	N/A			N/A			N/A		
ALL MEDIA		**9.0E-09**			**3.4E-05**			**2.8E-10**			**4.2E-09**			**6.5E-07**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

000386

6502

TABLE B.3.4-31(a)

SOLID WASTE LANDFILL

RISKS DUE TO ESTIMATED RN-222 EMISSION

	Subunit			Background		
	Maximum RN-222 Air Concentration (pCi/m3)*	Intake (pCi)	Risk	Background RN-222 Air Concentration (pCi/m3)**	Intake (pCi)	Risk
Current Trespassing Youth	1.6E+00	3.3E+03	2.6E-08	9.0E-01	1.9E+03	1.4E-08
Current/Future Off-Property Farmer	2.6E-02	3.0E+03	2.3E-08	1.5E-02	1.7E+03	1.3E-08
Current/Future Off-Property Child	2.6E-02	5.5E+01	4.3E-10	1.5E-02	3.1E+01	2.4E-10
Current Groundskeeper	1.6E+00	2.8E+04	2.2E-07	9.0E-01	1.6E+04	1.2E-07
Future Expanded Trespasser (Adult + Child)	1.6E+00	5.2E+03	4.0E-08	9.0E-01	2.9E+03	2.3E-08
Future, RME On-Property Farmer	1.6E+00	1.9E+05	1.4E-06	9.0E-01	1.0E+05	8.1E-07
Future, CT On-Property Farmer	1.6E+00	1.4E+04	1.1E-07	9.0E-01	7.7E+03	6.0E-08
Future, On-Property Child	1.6E+00	3.4E+03	2.6E-08	9.0E-01	1.9E+03	1.5E-08

*Represents subsurface soil Ra-226 estimate of 1.55 pCi/g.

**Assumes RA-226 concentration is 1.228 pCi/g in surface soil and 0.78 pCi/g in subsurface soil.

TABLE B.3.4-31
CURRENT LAND USE
SOLID WASTE LANDFILL
SUMMARY OF NON-CARCINOGENIC HAZARD

Medium	Parameter	Trespassing Youth	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Farmer	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard	User of Milk and Meat	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/ Air	Arsenic	1.7E-03	98.49%	0.02%	N/D			N/D			N/A		
	Beryllium	2.6E-05	1.51%	0.00%	N/D			N/D			N/A		
	Total	1.8E-03	100.00%	0.02%									
Surface Water	Arsenic	4.9E-02	0.59%	0.57%	N/A			N/A			N/A		
	Beryllium	4.4E-03	0.05%	0.05%	N/A			N/A			N/A		
	U-TOTAL	8.2E+00	99.36%	96.33%	N/A			N/A			N/A		
	Total	8.3E+00	100.00%	96.94%									
GMR Surface Water	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	U-Total	N/A			N/A			N/A			N/A		
	Total												
Sediment	Arsenic	8.4E-04	0.32%	0.01%	N/A			N/A			N/A		
	Beryllium	2.4E-03	0.91%	0.03%	N/A			N/A			N/A		
	U-TOTAL	2.6E-01	98.76%	3.00%	N/A			N/A			N/A		
	Total	2.6E-01	100.00%	3.04%									
Homegrown Produce (Dust Affected)	Arsenic	N/A			1.3E-06	99.60%	68.34%	4.8E-06	99.76%	75.18%	N/A		
	Beryllium	N/A			5.0E-09	0.40%	0.27%	1.2E-08	0.24%	0.18%	N/A		
		N/A									N/A		
	Total				1.3E-06	100.00%	68.62%	4.8E-06	100.00%	75.36%			
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	U-Total	N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (Dust Affected)	Arsenic	N/A			5.7E-07	99.62%	31.27%	1.6E-06	99.75%	24.58%	5.7E-07	99.62%	99.62%
	Beryllium	N/A			2.2E-09	0.38%	0.12%	4.0E-09	0.25%	0.06%	2.2E-09	0.38%	0.38%
	Total				5.8E-07	100.00%	31.38%	1.6E-06	100.00%	24.64%	5.8E-07	100.00%	100.00%
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	U-Total	N/A			N/A			N/A			N/A		
	Total												
ALL MEDIA		**8.6E+00**			**1.8E-06**			**6.4E-06**			**5.8E-07**		

000368

TABLE B.3.4-31
(current)

Medium	Parameter	Groundskeeper	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Rec User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Res User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/ Air	Arsenic	3.2E-03	74.27%	74.27%	N/A			N/A			N/A		
	Beryllium	1.1E-03	25.73%	25.73%	N/A			N/A			N/A		
	Total	4.3E-03	100.00%	100.00%									
Surface Water	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A		
	Total												
GMR Surface Water	Arsenic	N/A			8.8E-08	77.73%	77.73%	2.1E-07	9.57%	9.57%	N/A		
	Beryllium	N/A			4.9E-11	0.04%	0.04%	2.6E-10	0.01%	0.01%	N/A		
	U-Total	N/A			2.5E-08	22.23%	22.23%	2.0E-06	90.42%	90.42%	N/A		
	Total				1.1E-07	100.00%	100.00%	2.2E-06	100.00%	100.00%			
Sediment	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A		
	Total												
Homegrown Produce (Dust Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
		N/A			N/A			N/A			N/A		
	Total												
Homegrown Produce (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			3.1E-05	40.25%	28.86%
	Beryllium	N/A			N/A			N/A			1.7E-08	0.02%	0.02%
	U-Total	N/A			N/A			N/A			4.6E-05	59.73%	42.82%
		N/A			N/A			N/A					
	Total										7.7E-05	100.00%	71.69%
Beef/Milk (Dust Affected)	Arsenic	N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A		
	Total												
Beef/Milk (GMR Surface Water Affected)	Arsenic	N/A			N/A			N/A			1.6E-05	54.60%	15.46%
	Beryllium	N/A			N/A			N/A			6.4E-09	0.02%	0.01%
	U-Total	N/A			N/A			N/A			1.4E-05	45.38%	12.85%
	Total										3.0E-05	100.00%	28.31%
ALL MEDIA		**4.3E-03**			**1.1E-07**			**2.2E-06**			**1.1E-04**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

N/D - not determined because toxicity data are not available.

000369

to radium-226, radium-228, thorium-228, and thorium-232 in soil via external radiation. HI was 8.6 due to the estimated presence of total uranium in surface water.

Total carcinogenic risk to the groundskeeper was 3.4×10^{-5} due primarily to radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in soil. Total hazard for this receptor did not exceed 1.0.

Tables B.3.4-32 and B.3.4-33 summarize risks and hazards, respectively, associated with the Solid Waste Landfill assuming future land use. Total receptor risks barely exceeded 1.0×10^{-6} for future off-property farmer (private ownership) receptors. Risks were mostly due to the cumulative presence of CPCs in soil.

Risk exceeded 1.0×10^{-3} for the RME on-property farmer and 1.0×10^{-4} for the child exposed to radium-226, radium-228, thorium-228, and thorium-232 in surface soil via external radiation. Additional contribution to risk to the child were from benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene in beef and milk products affected by dust. Total HI for RME farmer was below 1.0, but the child had an HI of 1.0 due to the cumulative presence of arsenic in soil, and on dust affected produce and beef and milk products.

Risk exceeded the 1.0×10^{-3} level for perched groundwater users. This was due mostly to the total receptor presence of radium-226, radium-228, thorium-228, and thorium-232 in surface soil, which accounted for 54 percent of the total risk to this receptor, and benzo(a)pyrene and dibenzo(a,h)anthracene in dust affected been and milk products which accounted for 22 percent of total risk to this receptor.

Total receptor risk to the homebuilder was 1.9×10^{-5} due mostly to the presence of radium-226, radium-228, thorium-228, thorium-232, uranium-238, arsenic, and benzo(a)pyrene in soil which accounted for approximately 81 percent of the total receptor risk. Total HI was below 1.0.

Total receptor risk to the CT on-property farmer was 1.9×10^{-4} due primarily to radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in soil which accounted for 70 percent of the total receptor risk. Other contributors to risk were benzo(a)pyrene and dibenzo(a,h)anthracene in dust

affected beef and milk products which accounted for an additional 16 percent of the total receptor risk. Total HI was below 1.0.

Total receptor risk to the perched groundwater user was 2.8×10^{-3} due mostly to radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in surface soil which accounted for approximately 60 percent of the total receptor risk and beef and milk products affected by dust containing arsenic, benzo(a)pyrene, and dibenzo(a,h)anthracene which accounted for another 25 percent of the total receptor risk.

The total receptor risk to the expanded trespasser exceeded 1.0×10^{-5} risk due mostly to external radiation from radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in soil which accounted for approximately 86 percent of the total receptor risk. Total HI was below 1.0.

Total risk and hazard for each user of the Great Miami River was below 1.0×10^{-7} and 1.0, respectively.

B.3.5 LIME SLUDGE PONDS

B.3.5.1 Exposure Point Concentrations

Table B.3.5-1 summarizes the exposure scenarios evaluated to assess risks associated with the Lime Sludge Ponds. It also summarizes derivation of exposure concentration specific to this subunit. Exposure point concentrations for surface soil were derived from the analytical data on samples collected within the boundaries of the Lime Sludge Ponds subunit. For groundwater, modeled data indicated contaminants did not enter the aquifer underlying the Lime Sludge Ponds. Exposure point concentrations for air were derived using modeled data. Exposure point concentrations for surface waster and sediment were not determined because there was not data available. For this subunit, under future land use it was assumed that the on-property farmer resided adjacent to the Lime Sludge Ponds and simultaneously farmed that area. The farmer was placed adjacent to the Lime Sludge Ponds because the subunit is considered insufficiently stable to support a farm or agricultural structures. This, and other relevant information regarding exposure point concentrations for the Lime Sludge Ponds is summarized in Table B.3.5-1.

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TABLE B.3.4-32
FUTURE LAND USE
SOLID WASTE LANDFILL
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk
Surface Soil/	CS-137																					
Air	NP-237	2.4E-07	1.28%	1.19%	6.0E-09	0.59%	0.52%	2.0E-10	0.59%	0.29%	1.1E-10	0.57%	0.15%	3.6E-12	0.57%	0.10%	2.3E-05	1.28%	0.82%	1.9E-06	1.28%	0.95%
	PB-210																					
	PU-238	5.8E-09	0.03%	0.03%	5.2E-09	0.52%	0.45%	1.7E-10	0.52%	0.25%	9.5E-11	0.50%	0.13%	3.1E-12	0.50%	0.09%	1.1E-06	0.06%	0.04%	5.9E-08	0.04%	0.03%
	PU-239/240	6.4E-10	0.00%	0.00%	5.4E-10	0.05%	0.05%	1.8E-11	0.05%	0.03%	9.8E-12	0.05%	0.01%	3.2E-13	0.05%	0.01%	1.2E-07	0.01%	0.00%	6.4E-09	0.00%	0.00%
	RA-224																					
	RA-226	3.8E-06	20.46%	18.96%	1.7E-09	0.17%	0.14%	5.6E-11	0.17%	0.08%	3.0E-11	0.16%	0.04%	1.0E-12	0.16%	0.03%	3.5E-04	19.86%	12.76%	2.9E-05	20.28%	15.03%
	RA-228	2.2E-06	11.78%	10.92%	2.0E-10	0.02%	0.02%	6.6E-12	0.02%	0.01%	3.7E-12	0.02%	0.01%	1.2E-13	0.02%	0.00%	2.0E-04	11.40%	7.32%	1.7E-05	11.69%	8.66%
	SR-90	1.1E-09	0.01%	0.01%	1.0E-11	0.00%	0.00%	3.4E-13	0.00%	0.00%	1.9E-13	0.00%	0.00%	6.1E-15	0.00%	0.00%	1.5E-07	0.01%	0.01%	7.3E-09	0.01%	0.00%
	TC-99																					
	TH-228	4.1E-06	22.05%	20.43%	2.2E-08	2.18%	1.90%	7.3E-10	2.19%	1.06%	4.0E-10	2.10%	0.57%	1.3E-11	2.11%	0.38%	3.8E-04	21.38%	13.73%	3.2E-05	21.94%	16.25%
	TH-230	4.7E-09	0.03%	0.02%	3.3E-08	3.23%	2.81%	1.1E-09	3.24%	1.57%	5.9E-10	3.11%	0.84%	1.9E-11	3.12%	0.56%	2.4E-06	0.13%	0.09%	1.7E-07	0.11%	0.08%
	TH-232	5.8E-06	31.02%	28.74%	2.9E-08	2.87%	2.49%	9.5E-10	2.87%	1.39%	5.2E-10	2.76%	0.74%	1.7E-11	2.76%	0.50%	5.4E-04	30.08%	19.33%	4.5E-05	30.86%	22.86%
	U-234	3.3E-08	0.18%	0.17%	1.9E-07	18.86%	16.40%	6.3E-09	18.88%	9.17%	3.5E-09	18.15%	4.90%	1.1E-10	18.18%	3.29%	1.5E-05	0.82%	0.53%	1.0E-06	0.69%	0.51%
	U-235																					
	U-235/236	3.1E-07	1.66%	1.53%	1.2E-08	1.22%	1.06%	4.1E-10	1.22%	0.59%	2.2E-10	1.18%	0.32%	7.4E-12	1.18%	0.21%	2.9E-05	1.64%	1.05%	2.4E-06	1.68%	1.24%
	U-238	1.4E-06	7.30%	6.76%	7.0E-07	69.23%	60.19%	2.3E-08	69.18%	33.60%	1.3E-08	66.64%	17.98%	4.2E-10	66.59%	12.04%	1.7E-04	9.39%	6.03%	1.3E-05	9.12%	6.76%
	Total Radiological Risk	1.8E-05	95.79%	88.75%	1.0E-06	98.94%	86.02%	3.3E-08	98.94%	48.05%	1.8E-08	95.24%	25.70%	6.0E-10	95.23%	17.22%	1.7E-03	96.06%	61.70%	1.4E-04	97.70%	72.39%
	Arsenic	3.9E-07	2.12%	1.96%	9.7E-09	0.96%	0.84%	3.2E-10	0.96%	0.47%	8.2E-10	4.32%	1.17%	2.7E-11	4.33%	0.78%	3.0E-05	1.70%	1.09%	1.4E-06	0.99%	0.73%
	Benzo(a)anthracene	1.3E-08	0.07%	0.06%	2.1E-11	0.00%	0.00%	7.2E-13	0.00%	0.00%	1.8E-12	0.01%	0.00%	6.0E-14	0.01%	0.00%	1.3E-06	0.07%	0.05%	6.3E-08	0.04%	0.03%
	Benzo(a)pyrene	1.2E-07	0.64%	0.59%	2.0E-10	0.02%	0.02%	6.6E-12	0.02%	0.01%	1.7E-11	0.09%	0.02%	5.6E-13	0.09%	0.02%	1.2E-05	0.69%	0.44%	5.9E-07	0.40%	0.30%
	Benzo(b)fluoranthene	2.5E-08	0.13%	0.12%	4.2E-11	0.00%	0.00%	1.4E-12	0.00%	0.00%	3.6E-12	0.02%	0.01%	1.2E-13	0.02%	0.00%	2.6E-06	0.14%	0.09%	1.2E-07	0.08%	0.06%
	Beryllium	1.4E-07	0.78%	0.72%	5.7E-10	0.06%	0.05%	1.9E-11	0.06%	0.03%	4.8E-11	0.25%	0.07%	1.6E-12	0.25%	0.05%	1.5E-05	0.83%	0.53%	7.1E-07	0.49%	0.36%
	Carbazole																					
	Dibenzo(a,h)anthracene	7.0E-08	0.38%	0.35%	1.2E-10	0.01%	0.01%	3.9E-12	0.01%	0.01%	1.0E-11	0.05%	0.01%	3.3E-13	0.05%	0.01%	7.2E-06	0.40%	0.26%	3.4E-07	0.24%	0.18%
	Indeno(1,2,3-cd)pyrene	1.7E-08	0.09%	0.08%	2.8E-11	0.00%	0.00%	9.4E-13	0.00%	0.00%	2.4E-12	0.01%	0.00%	7.9E-14	0.01%	0.00%	1.7E-06	0.10%	0.06%	8.3E-08	0.06%	0.04%
	Heptachlorodibenzo-p-dioxin	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Heptachlorodibenzofuran	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Octachlorodibenzo-p-dioxin	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Aroclor-1254	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Aroclor-1260	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	7.8E-07	4.21%	3.90%	1.1E-08	1.06%	0.92%	3.5E-10	1.06%	0.52%	9.1E-10	4.76%	1.28%	3.0E-11	4.77%	0.86%	7.0E-05	3.94%	2.53%	3.3E-06	2.30%	1.71%
	Total	1.9E-05	100.00%	92.65%	1.0E-06	100.00%	86.94%	3.3E-08	100.00%	48.56%	1.9E-08	100.00%	26.99%	6.2E-10	100.00%	18.08%	1.8E-03	100.00%	64.24%	1.5E-04	100.00%	74.09%

TABLE B.3.4-32
(continued)

Medium	Parameter	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137				2.9E-08	0.32%	0.32%												
	NP-237	1.7E-06	1.10%	0.27%	1.2E-08	0.13%	0.13%	2.3E-05	1.28%	0.82%	N/A			N/A			N/A		
	PB-210				2.7E-08	0.31%	0.31%				N/A			N/A			N/A		
	PU-238	7.7E-08	0.05%	0.01%	3.1E-09	0.03%	0.03%	1.1E-06	0.06%	0.04%	N/A			N/A			N/A		
	PU-239/240	8.5E-09	0.01%	0.00%	6.3E-09	0.07%	0.07%	1.2E-07	0.01%	0.00%	N/A			N/A			N/A		
	RA-224				6.1E-09	0.07%	0.07%				N/A			N/A			N/A		
	RA-226	2.7E-05	17.07%	4.18%	5.8E-07	6.50%	6.50%	3.5E-04	19.86%	12.73%	N/A			N/A			N/A		
	RA-228	1.5E-05	9.77%	2.39%	4.4E-07	4.87%	4.87%	2.0E-04	11.40%	7.30%	N/A			N/A			N/A		
	SR-90	1.4E-08	0.01%	0.00%	2.3E-09	0.03%	0.03%	1.5E-07	0.01%	0.01%	N/A			N/A			N/A		
	TC-99				4.0E-11	0.00%	0.00%				N/A			N/A			N/A		
	TH-228	2.9E-05	18.26%	4.48%	1.1E-06	12.25%	12.25%	3.8E-04	21.38%	13.70%	N/A			N/A			N/A		
	TH-230	7.2E-08	0.05%	0.01%	7.4E-09	0.08%	0.08%	2.4E-06	0.13%	0.09%	N/A			N/A			N/A		
	TH-232	4.0E-05	25.71%	6.30%	1.8E-06	19.83%	19.83%	5.4E-04	30.08%	19.28%	N/A			N/A			N/A		
	U-234	5.0E-07	0.32%	0.08%	6.8E-08	0.76%	0.76%	1.5E-05	0.82%	0.52%	N/A			N/A			N/A		
	U-235				2.7E-08	0.30%	0.30%												
	U-235/236	2.2E-06	1.38%	0.34%	1.2E-07	1.30%	1.30%	2.9E-05	1.64%	1.05%	N/A			N/A			N/A		
	U-238	1.0E-05	6.62%	1.62%	5.6E-07	6.28%	6.28%	1.7E-04	9.39%	6.02%	N/A			N/A			N/A		
	Total Radiological Risk	1.3E-04	80.34%	19.69%	4.8E-06	53.14%	53.14%	1.7E-03	96.06%	61.55%									
	Arsenic	1.3E-05	8.31%	2.04%	5.5E-07	6.14%	6.14%	3.0E-05	1.70%	1.09%	N/A			N/A			N/A		
	Benzo(a)anthracene	5.9E-07	0.38%	0.09%	2.5E-07	2.75%	2.75%	1.3E-06	0.07%	0.05%	N/A			N/A			N/A		
	Benzo(a)pyrene	5.4E-06	3.49%	0.85%	2.7E-06	30.05%	30.05%	1.2E-05	0.69%	0.44%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	1.1E-06	0.73%	0.18%	4.9E-08	0.55%	0.55%	2.6E-06	0.14%	0.09%	N/A			N/A			N/A		
	Beryllium	6.6E-06	4.22%	1.03%	2.1E-07	2.32%	2.32%	1.5E-05	0.83%	0.53%	N/A			N/A			N/A		
	Carbazole				1.9E-09	0.02%	0.02%				N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	3.2E-06	2.05%	0.50%	8.2E-08	0.92%	0.92%	7.2E-06	0.40%	0.26%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	7.7E-07	0.49%	0.12%	1.8E-07	2.02%	2.02%	1.7E-06	0.10%	0.06%	N/A			N/A			N/A		
	Heptachlorodibenzo-p-dioxin				5.2E-08	0.58%	0.58%				N/A			N/A			N/A		
	Heptachlorodibenzofuran				1.5E-08	0.16%	0.16%				N/A			N/A			N/A		
	Octachlorodibenzo-p-dioxin				8.0E-08	0.89%	0.89%				N/A			N/A			N/A		
	Aroclor-1254				1.6E-08	0.18%	0.18%				N/A			N/A			N/A		
	Aroclor-1260				2.6E-08	0.29%	0.29%				N/A			N/A			N/A		
	Total Chemical Risk	3.1E-05	19.66%	4.82%	4.2E-06	46.86%	45.50%	7.0E-05	3.94%	2.53%									
	Total	1.6E-04	100.00%	24.50%	9.0E-06	100.00%	98.64%	1.8E-03	100.00%	64.07%									

TABLE B.3.4-32
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	3.8E-08	2.74%	0.19%	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	6.0E-07	43.65%	2.99%	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	3.5E-07	25.36%	1.74%	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	1.3E-10	0.01%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	2.7E-09	0.20%	0.01%	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	4.9E-08	3.54%	0.24%	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	2.1E-07	15.08%	1.03%	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	1.2E-06	90.58%	6.20%																		
	Arsenic	7.8E-08	5.66%	0.39%	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	1.9E-09	0.14%	0.01%	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	1.8E-08	1.30%	0.09%	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	2.1E-08	1.57%	0.11%	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenz(a,h)anthracene	1.0E-08	0.76%	0.05%	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	1.3E-07	9.42%	0.65%																		
	Total	1.4E-06	100.00%	6.85%																		
Surface Water	NP-237	2.5E-09	4.13%	0.01%	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	8.3E-10	1.36%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	1.3E-10	0.21%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	1.8E-09	2.96%	0.01%	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	4.8E-09	7.78%	0.02%	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	3.2E-10	0.52%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	1.5E-08	25.04%	0.08%	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	2.6E-08	42.00%	0.13%																		
	Arsenic	3.2E-08	53.20%	0.16%	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	9.8E-11	0.16%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	3.8E-10	0.62%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	2.2E-09	3.64%	0.01%	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	2.3E-10	0.38%	0.00%	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	3.5E-08	58.00%	0.18%																		
	Total	6.1E-08	100.00%	0.31%																		
GMR Surface Water	NP-237	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																					
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																					
	Total																					
Groundwater	TC-99	N/A			3.4E-09	100.00%	0.30%	3.4E-09	100.00%	5.03%	1.5E-10	100.00%	0.21%	1.5E-10	100.00%	4.27%	3.9E-08	100.00%	0.00%	2.3E-09	100.00%	0.00%
	Total Radiological Risk				3.4E-09	100.00%	0.30%	3.4E-09	100.00%	5.03%	1.5E-10	100.00%	0.21%	1.5E-10	100.00%	4.27%	3.9E-08	100.00%	0.00%	2.3E-09	100.00%	0.00%
Perched Groundwater	TC-99	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Carbazole	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																					
	Total																					

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TABLE B.3.4-32
(continued)

Medium	Parameter	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenz(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
	NP-237	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																		
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																		
	Total																		
GMR Surface Water	NP-237	N/A			N/A			N/A			6.6E-13	0.23%	0.23%	1.6E-11	0.39%	0.39%	N/A		
	RA-226	N/A			N/A			N/A			1.1E-12	0.38%	0.38%	5.3E-12	0.13%	0.13%	N/A		
	RA-228	N/A			N/A			N/A			1.7E-13	0.06%	0.06%	8.2E-13	0.02%	0.02%	N/A		
	SR-90	N/A			N/A			N/A			1.4E-12	0.50%	0.50%	1.2E-11	0.28%	0.28%	N/A		
	U-234	N/A			N/A			N/A			2.6E-12	0.93%	0.93%	3.0E-10	7.32%	7.32%	N/A		
	U-235/236	N/A			N/A			N/A			1.8E-14	0.01%	0.01%	2.0E-12	0.05%	0.05%	N/A		
	U-238	N/A			N/A			N/A			8.4E-13	0.30%	0.30%	9.8E-11	2.35%	2.35%	N/A		
	Total Radiological Risk										6.8E-12	2.41%	2.41%	4.4E-10	10.53%	10.53%			
	Arsenic	N/A			N/A			N/A			2.0E-11	7.00%	7.00%	3.7E-09	88.31%	88.31%	N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			9.2E-12	3.25%	3.25%	9.9E-13	0.02%	0.02%	N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			7.7E-11	27.36%	27.36%	3.9E-12	0.09%	0.09%	N/A		
	Beryllium	N/A			N/A			N/A			3.4E-13	0.12%	0.12%	4.1E-11	0.98%	0.98%	N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			1.7E-10	59.86%	59.86%	2.3E-12	0.06%	0.06%	N/A		
	Total Chemical Risk										2.8E-10	97.59%	9.8E-01	3.7E-09	89.47%	8.9E-01			
	Total										2.8E-10	100.00%	100.00%	4.2E-09	100.00%	100.00%			
Groundwater	TC-99	1.7E-09	100.00%	0.00%	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk	1.7E-09	100.00%	0.00%															
Perched Groundwater	TC-99	N/A			N/A			1.8E-06	25.90%	0.07%	N/A			N/A			N/A		
	Total Radiological Risk	N/A			N/A			1.8E-06	25.90%	0.07%	N/A			N/A			N/A		
	Carbazole	N/A			N/A			5.3E-06	74.10%	0.19%	N/A			N/A			N/A		
	Total Chemical Risk							5.3E-06	74.10%	0.19%									
	Total							7.1E-06	100.00%	0.26%									

TABLE B.3.4-32
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	NP-237	N/A			6.8E-10	1.55%	0.06%	2.2E-11	1.56%	0.03%	4.8E-11	0.43%	0.07%	1.6E-12	0.43%	0.05%	3.4E-06	2.80%	0.12%	1.9E-07	2.80%	0.09%
	PU-238	N/A			3.8E-10	0.86%	0.03%	1.2E-11	0.86%	0.02%	2.7E-11	0.24%	0.04%	8.7E-13	0.24%	0.03%	1.0E-08	0.01%	0.00%	5.6E-10	0.01%	0.00%
	PU-239/240	N/A			4.2E-11	0.10%	0.00%	1.4E-12	0.10%	0.00%	3.0E-12	0.03%	0.00%	9.8E-14	0.03%	0.00%	1.1E-09	0.00%	0.00%	6.2E-11	0.00%	0.00%
	RA-226	N/A			2.9E-09	6.62%	0.25%	9.7E-11	6.75%	0.14%	2.1E-10	1.83%	0.29%	6.9E-12	1.85%	0.20%	2.1E-06	1.76%	0.08%	1.2E-07	1.76%	0.06%
	RA-228	N/A			3.7E-10	0.85%	0.03%	4.2E-12	0.29%	0.01%	1.6E-11	0.14%	0.02%	8.6E-13	0.23%	0.02%	3.2E-07	0.27%	0.01%	1.8E-08	0.27%	0.01%
	SR-90	N/A			1.3E-10	0.29%	0.01%	4.2E-12	0.29%	0.01%	8.9E-12	0.08%	0.01%	2.9E-13	0.08%	0.01%	1.1E-05	9.20%	0.40%	6.1E-07	9.20%	0.31%
	TH-228	N/A			2.0E-10	0.44%	0.02%	6.4E-12	0.45%	0.01%	1.4E-11	0.12%	0.02%	4.5E-13	0.12%	0.01%	9.9E-09	0.01%	0.00%	5.4E-10	0.01%	0.00%
	TH-230	N/A			1.9E-10	0.43%	0.02%	6.3E-12	0.44%	0.01%	1.3E-11	0.12%	0.02%	4.4E-13	0.12%	0.01%	9.4E-09	0.01%	0.00%	5.2E-10	0.01%	0.00%
	TH-232	N/A			5.8E-10	1.33%	0.05%	1.9E-11	1.33%	0.03%	4.1E-11	0.37%	0.06%	1.4E-12	0.37%	0.04%	2.9E-08	0.02%	0.00%	1.6E-09	0.02%	0.00%
	U-234	N/A			1.6E-09	3.72%	0.14%	5.4E-11	3.74%	0.08%	1.2E-10	1.03%	0.16%	3.8E-12	1.03%	0.11%	3.5E-06	2.89%	0.13%	1.9E-07	2.89%	0.10%
	U-235/236	N/A			1.1E-10	0.25%	0.01%	3.6E-12	0.25%	0.01%	7.8E-12	0.07%	0.01%	2.6E-13	0.07%	0.01%	2.3E-07	0.19%	0.01%	1.3E-08	0.19%	0.01%
	U-238	N/A			5.3E-09	11.95%	0.45%	1.7E-10	11.98%	0.25%	3.7E-10	3.30%	0.53%	1.2E-11	3.29%	0.35%	1.1E-05	9.26%	0.40%	6.1E-07	9.26%	0.31%
	Total Radiological Risk				1.2E-08	28.37%	1.07%	4.0E-10	28.04%	0.59%	8.7E-10	7.74%	1.23%	2.9E-11	7.85%	0.84%	3.2E-05	26.42%	1.15%	1.7E-06	26.42%	0.89%
	Arsenic	N/A			2.0E-08	45.50%	1.72%	6.6E-10	45.71%	0.96%	6.6E-09	58.62%	9.35%	2.2E-10	58.55%	6.27%	5.1E-05	41.95%	1.82%	2.8E-06	41.95%	1.42%
	Benzo(a)anthracene	N/A			3.5E-10	0.80%	0.03%	1.2E-11	0.81%	0.02%	1.2E-10	1.03%	0.16%	3.8E-12	1.04%	0.11%	4.0E-06	3.31%	0.14%	2.2E-07	3.31%	0.11%
	Benzo(a)pyrene	N/A			3.2E-09	7.26%	0.27%	1.1E-10	7.30%	0.15%	1.0E-09	9.34%	1.49%	3.5E-11	9.34%	1.00%	2.1E-05	17.11%	0.74%	1.1E-06	17.11%	0.58%
	Benzo(b)fluoranthene	N/A			6.6E-10	1.51%	0.06%	2.2E-11	1.51%	0.03%	2.2E-10	1.94%	0.31%	7.2E-12	1.93%	0.21%	4.2E-06	3.48%	0.15%	2.3E-07	3.48%	0.12%
	Beryllium	N/A			5.0E-09	11.37%	0.43%	1.6E-10	11.41%	0.24%	1.6E-09	14.65%	2.34%	5.4E-11	14.62%	1.57%	3.3E-06	2.70%	0.12%	1.8E-07	2.70%	0.09%
	Dibenzo(a,h)anthracene	N/A			1.8E-09	4.18%	0.16%	6.1E-11	4.21%	0.09%	6.1E-10	5.38%	0.86%	2.0E-11	5.38%	0.58%	4.5E-06	3.76%	0.16%	2.5E-07	3.76%	0.13%
	Indeno(1,2,3-cd)pyrene	N/A			4.4E-10	1.01%	0.04%	1.5E-11	1.01%	0.02%	1.5E-10	1.29%	0.21%	4.8E-12	1.29%	0.14%	1.5E-06	1.28%	0.06%	8.4E-08	1.28%	0.04%
	Total Chemical Risk				3.2E-08	71.63%	2.71%	1.0E-09	71.96%	1.52%	1.0E-08	92.26%	14.72%	3.4E-10	92.15%	9.87%	8.9E-05	73.58%	3.19%	4.9E-06	73.58%	2.49%
	Total				4.4E-08	100.00%	3.79%	1.4E-09	100.00%	2.11%	1.1E-08	100.00%	15.95%	3.7E-10	100.00%	10.71%	1.2E-04	100.00%	4.34%	6.6E-06	100.00%	3.38%
Homegrown Produce (Groundwater Affected)	TC-99	N/A			1.2E-09	100.00%	0.10%	1.2E-09	100.00%	1.68%	8.1E-11	100.00%	0.12%	8.1E-11	100.00%	2.35%	1.3E-08	100.00%	0.00%	7.1E-10	100.00%	0.00%
	Total Radiological Risk				1.2E-09	100.00%	0.10%	1.2E-09	100.00%	1.68%	8.1E-11	100.00%	0.12%	8.1E-11	100.00%	2.35%	1.3E-08	100.00%	0.00%	7.1E-10	100.00%	0.00%
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																					
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total																					
Beef/Milk (Dust Affected)	NP-237	N/A			8.4E-12	0.01%	0.00%	2.8E-13	0.01%	0.00%	6.4E-13	0.00%	0.00%	2.1E-14	0.00%	0.00%	2.0E-07	0.02%	0.01%	1.1E-08	0.02%	0.01%
	PU-238	N/A			2.8E-14	0.00%	0.00%	9.2E-16	0.00%	0.00%	2.9E-15	0.00%	0.00%	9.6E-17	0.00%	0.00%	1.5E-10	0.00%	0.00%	7.6E-12	0.00%	0.00%
	PU-239/240	N/A			8.9E-15	0.00%	0.00%	2.9E-16	0.00%	0.00%	9.3E-16	0.00%	0.00%	3.1E-17	0.00%	0.00%	1.6E-11	0.00%	0.00%	8.5E-13	0.00%	0.00%
	RA-226	N/A			1.5E-09	2.02%	0.13%	5.2E-11	2.05%	0.08%	2.7E-10	0.69%	0.38%	9.0E-12	0.70%	0.26%	5.1E-06	0.59%	0.19%	2.4E-07	0.54%	0.12%
	RA-228	N/A			4.4E-11	0.06%	0.00%	1.4E-12	0.06%	0.00%	7.6E-12	0.02%	0.01%	2.5E-13	0.02%	0.01%	7.8E-07	0.09%	0.03%	3.6E-08	0.08%	0.02%
	SR-90	N/A			2.5E-10	0.33%	0.02%	8.3E-12	0.33%	0.01%	4.7E-11	0.12%	0.07%	1.5E-12	0.12%	0.04%	5.0E-05	5.72%	1.80%	2.3E-06	5.17%	1.16%
	TH-228	N/A			2.6E-13	0.00%	0.00%	8.7E-15	0.00%	0.00%	4.2E-14	0.00%	0.00%	1.4E-15	0.00%	0.00%	2.3E-09	0.00%	0.00%	1.1E-10	0.00%	0.00%
	TH-230	N/A			1.4E-12	0.00%	0.00%	4.6E-14	0.00%	0.00%	2.2E-13	0.00%	0.00%	7.2E-15	0.00%	0.00%	2.2E-09	0.00%	0.00%	1.0E-10	0.00%	0.00%
	TH-232	N/A			4.3E-12	0.01%	0.00%	1.4E-13	0.01%	0.00%	6.7E-13	0.00%	0.00%	2.2E-14	0.00%	0.00%	6.7E-09	0.00%	0.00%	3.2E-10	0.00%	0.00%
	U-234	N/A			3.3E-10	0.43%	0.03%	1.1E-11	0.43%	0.02%	6.0E-11	0.15%	0.09%	2.0E-12	0.15%	0.06%	3.0E-06	0.34%	0.11%	1.4E-07	0.31%	0.07%
	U-235/236	N/A			2.2E-11	0.03%	0.00%	7.3E-13	0.03%	0.00%	4.1E-12	0.01%	0.01%	1.3E-13	0.01%	0.00%	2.0E-07	0.02%	0.01%	9.3E-09	0.02%	0.00%
	U-238	N/A			1.1E-09	1.39%	0.09%	3.5E-11	1.39%	0.05%	1.9E-10	0.50%	0.28%	6.4E-12	0.50%	0.18%	9.6E-06	1.10%	0.34%	4.4E-07	1.00%	0.22%
	Total Radiological Risk				3.3E-09	4.28%	0.28%	1.1E-10	4.31%	0.16%	5.8E-10	1.50%	0.83%	1.9E-11	1.51%	0.56%	6.9E-05	7.89%	2.48%	3.1E-06	7.16%	1.61%

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TABLE B.3.4-32
(continued)

Medium	Parameter	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Dust Affected)	NP-237	2.4E-07	0.76%	0.04%	N/A			3.4E-06	2.80%	0.12%	N/A			N/A			N/A		
	PU-238	7.3E-10	0.00%	0.00%	N/A			1.0E-08	0.01%	0.00%	N/A			N/A			N/A		
	PU-239/240	8.1E-11	0.00%	0.00%	N/A			1.1E-09	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	1.5E-07	0.48%	0.02%	N/A			2.1E-06	1.76%	0.08%	N/A			N/A			N/A		
	RA-228	2.3E-08	0.07%	0.00%	N/A			3.2E-07	0.27%	0.01%	N/A			N/A			N/A		
	SR-90	7.8E-07	2.49%	0.12%	N/A			1.1E-05	9.20%	0.40%	N/A			N/A			N/A		
	TH-228	7.0E-10	0.00%	0.00%	N/A			9.9E-09	0.01%	0.00%	N/A			N/A			N/A		
	TH-230	6.7E-10	0.00%	0.00%	N/A			9.4E-09	0.01%	0.00%	N/A			N/A			N/A		
	TH-232	2.0E-09	0.01%	0.00%	N/A			2.9E-08	0.02%	0.00%	N/A			N/A			N/A		
	U-234	2.5E-07	0.78%	0.04%	N/A			3.5E-06	2.89%	0.13%	N/A			N/A			N/A		
	U-235/236	1.7E-08	0.05%	0.00%	N/A			2.3E-07	0.19%	0.01%	N/A			N/A			N/A		
	U-238	7.9E-07	2.51%	0.12%	N/A			1.1E-05	9.26%	0.40%	N/A			N/A			N/A		
	Total Radiological Risk	2.2E-06	7.15%	0.35%				3.2E-05	26.42%	1.14%									
	Arsenic	1.7E-05	52.98%	2.61%	N/A			5.1E-05	41.95%	1.82%	N/A			N/A			N/A		
	Benzo(a)anthracene	1.3E-06	4.17%	0.21%	N/A			4.0E-06	3.31%	0.14%	N/A			N/A			N/A		
	Benzo(a)pyrene	6.8E-06	21.56%	1.06%	N/A			2.1E-05	17.11%	0.74%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	1.4E-06	4.38%	0.22%	N/A			4.2E-06	3.48%	0.15%	N/A			N/A			N/A		
	Beryllium	1.1E-06	3.41%	0.17%	N/A			3.3E-06	2.70%	0.12%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	1.5E-06	4.74%	0.23%	N/A			4.5E-06	3.76%	0.16%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	5.0E-07	1.61%	0.08%	N/A			1.5E-06	1.28%	0.06%	N/A			N/A			N/A		
	Total Chemical Risk	2.9E-05	92.85%	4.58%				8.9E-05	73.58%	3.19%									
	Total	3.1E-05	100.00%	4.93%				1.2E-04	100.00%	4.33%									
Homegrown Produce (Groundwater Affected)	TC-99	9.2E-10	100.00%	0.00%	N/A			1.3E-08	100.00%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	9.2E-10	100.00%	0.00%				1.3E-08	100.00%	0.00%									
Homegrown Produce (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			1.1E-09	3.03%	0.17%
	RA-226	N/A			N/A			N/A			N/A			N/A			4.5E-10	1.24%	0.07%
	RA-228	N/A			N/A			N/A			N/A			N/A			1.5E-12	0.00%	0.00%
	SR-90	N/A			N/A			N/A			N/A			N/A			2.9E-09	7.97%	0.44%
	U-234	N/A			N/A			N/A			N/A			N/A			1.1E-08	31.15%	1.73%
	U-235/236	N/A			N/A			N/A			N/A			N/A			7.6E-11	0.21%	0.01%
	U-238	N/A			N/A			N/A			N/A			N/A			3.6E-09	10.00%	0.55%
	Total Radiological Risk																1.9E-08	53.59%	2.97%
	Arsenic	N/A			N/A			N/A			N/A			N/A			1.6E-08	44.77%	2.48%
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			5.7E-12	0.02%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			1.2E-11	0.03%	0.00%
	Beryllium	N/A			N/A			N/A			N/A			N/A			5.7E-10	1.57%	0.09%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			3.8E-12	0.01%	0.00%
	Total Chemical Risk	N/A			N/A			N/A			N/A			N/A			1.7E-08	46.41%	2.57%
	Total																3.6E-08	100.00%	5.54%
Beef/Milk (Dust Affected)	NP-237	1.5E-08	0.00%	0.00%	N/A			2.0E-07	0.02%	0.01%	N/A			N/A			N/A		
	PU-238	1.5E-11	0.00%	0.00%	N/A			1.5E-10	0.00%	0.00%	N/A			N/A			N/A		
	PU-239/240	1.7E-12	0.00%	0.00%	N/A			1.6E-11	0.00%	0.00%	N/A			N/A			N/A		
	RA-226	9.0E-07	0.20%	0.14%	N/A			5.1E-06	0.59%	0.18%	N/A			N/A			N/A		
	RA-228	1.4E-07	0.03%	0.02%	N/A			7.8E-07	0.09%	0.03%	N/A			N/A			N/A		
	SR-90	9.3E-06	2.07%	1.46%	N/A			5.0E-05	5.72%	1.79%	N/A			N/A			N/A		
	TH-228	3.6E-10	0.00%	0.00%	N/A			2.3E-09	0.00%	0.00%	N/A			N/A			N/A		
	TH-230	3.4E-10	0.00%	0.00%	N/A			2.2E-09	0.00%	0.00%	N/A			N/A			N/A		
	TH-232	1.0E-09	0.00%	0.00%	N/A			6.7E-09	0.00%	0.00%	N/A			N/A			N/A		
	U-234	5.4E-07	0.12%	0.09%	N/A			3.0E-06	0.34%	0.11%	N/A			N/A			N/A		
	U-235/236	3.7E-08	0.01%	0.01%	N/A			2.0E-07	0.02%	0.01%	N/A			N/A			N/A		
	U-238	1.7E-06	0.39%	0.27%	N/A			9.6E-06	1.10%	0.34%	N/A			N/A			N/A		
	Total Radiological Risk	1.3E-05	2.82%	1.99%				6.9E-05	7.89%	2.47%									

TABLE B.3.4-32
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Dust Affected) *(continued)*	Arsenic	N/A			9.2E-09	11.97%	0.79%	3.0E-10	11.95%	0.44%	2.2E-09	5.52%	3.06%	7.1E-11	5.51%	2.05%	6.7E-05	7.72%	2.42%	3.8E-06	8.55%	1.92%
	Benzo(a)anthracene	N/A			5.2E-10	0.67%	0.04%	1.7E-11	0.68%	0.03%	3.0E-10	0.76%	0.42%	9.9E-12	0.77%	0.29%	1.1E-05	1.25%	0.39%	5.5E-07	1.25%	0.28%
	Benzo(a)pyrene	N/A			1.3E-08	16.79%	1.11%	4.2E-10	16.79%	0.62%	7.4E-09	18.95%	10.49%	2.4E-10	18.95%	7.05%	2.0E-04	22.43%	7.04%	9.9E-06	22.39%	5.03%
	Benzo(b)fluoranthene	N/A			2.8E-09	3.61%	0.24%	9.1E-11	3.60%	0.13%	1.6E-09	4.08%	2.26%	5.2E-11	4.06%	1.51%	4.2E-05	4.83%	1.51%	2.1E-06	4.82%	1.08%
	Beryllium	N/A			1.4E-09	1.86%	0.12%	4.7E-11	1.85%	0.07%	2.2E-10	0.57%	0.32%	7.3E-12	0.57%	0.21%	3.1E-06	0.36%	0.11%	1.8E-07	0.40%	0.09%
	Dibenzo(a,h)anthracene	N/A			4.1E-08	53.84%	3.55%	1.4E-09	53.84%	1.98%	2.4E-08	60.74%	33.65%	7.8E-10	60.74%	22.59%	4.2E-04	48.36%	15.17%	2.1E-05	48.28%	10.85%
	Indeno(1,2,3-cd)pyrene	N/A			5.3E-09	6.98%	0.46%	1.8E-10	6.98%	0.26%	3.1E-09	7.88%	4.36%	1.0E-10	7.87%	2.93%	6.2E-05	7.16%	2.24%	3.1E-06	7.14%	1.61%
	Total Chemical Risk				7.3E-08	95.72%	6.30%	2.4E-09	95.69%	3.53%	3.8E-08	98.50%	54.56%	1.3E-09	98.49%	36.62%	8.0E-04	92.11%	28.89%	4.1E-05	92.84%	20.86%
	Total				7.7E-08	100.00%	6.59%	2.5E-09	100.00%	3.69%	3.9E-08	100.00%	55.39%	1.3E-09	100.00%	37.18%	8.7E-04	100.00%	31.37%	4.4E-05	100.00%	22.47%
Beef/Milk (Groundwater Affected)	TC-99	N/A			3.1E-09	100.00%	0.27%	3.1E-09	100.00%	4.59%	5.2E-10	100.00%	0.74%	5.2E-10	100.00%	15.10%	3.5E-08	100.00%	0.00%	1.7E-09	100.00%	0.00%
	Total Radiological Risk				3.1E-09	100.00%	0.27%	3.1E-09	100.00%	4.59%	5.2E-10	100.00%	0.74%	5.2E-10	100.00%	15.10%	3.5E-08	100.00%	0.00%	1.7E-09	100.00%	0.00%
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	RA-226	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	RA-228	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-234	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-235/236	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	U-238	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk																					
	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk																					
	Total																					
Ambient Radon		4.008E-08		0.20%	2.3E-08		2.02%	2.3E-08			4.3E-10		0.60%	4.3E-10			1.4E-06		0.05%	1.1E-07		0.05%
ALL MEDIA		2.0E-05			1.2E-06			6.8E-08			7.0E-08			3.5E-09			2.8E-03			2.0E-04		

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TABLE B.3.4-32
(continued)

Medium	Parameter	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Res User	% Total Medium Risk	% Total Receptor Risk	Great Miami River Ag. User	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Dust Affected) *(continued)*	Arsenic	1.6E-05	3.52%	2.48%	N/A			6.7E-05	7.72%	2.42%	N/A			N/A			N/A		
	Benzo(a)anthracene	6.3E-06	1.39%	0.98%	N/A			1.1E-05	1.25%	0.39%	N/A			N/A			N/A		
	Benzo(a)pyrene	1.1E-04	24.98%	17.63%	N/A			2.0E-04	22.43%	7.02%	N/A			N/A			N/A		
	Benzo(b)fluoranthene	2.4E-05	5.38%	3.80%	N/A			4.2E-05	4.83%	1.51%	N/A			N/A			N/A		
	Beryllium	4.9E-07	0.11%	0.08%	N/A			3.1E-06	0.36%	0.11%	N/A			N/A			N/A		
	Dibenzo(a,h)anthracene	2.4E-04	53.84%	37.99%	N/A			4.2E-04	48.36%	15.13%	N/A			N/A			N/A		
	Indeno(1,2,3-cd)pyrene	3.6E-05	7.97%	5.62%	N/A			6.2E-05	7.16%	2.24%	N/A			N/A			N/A		
	Total Chemical Risk	4.4E-04	97.18%	68.58%				8.0E-04	92.11%	28.82%									
	Total	4.5E-04	100.00%	70.56%				8.7E-04	100.00%	31.29%									
Beef/Milk (Groundwater Affected)	TC-99	5.9E-09	100.00%	0.00%	N/A			3.5E-08	100.00%	0.00%	N/A			N/A			N/A		
	Total Radiological Risk	5.9E-09	100.00%	0.00%				3.5E-08	100.00%	0.00%									
Beef/Milk (GMR Surface Water Affected)	NP-237	N/A			N/A			N/A			N/A			N/A			2.2E-08	3.50%	3.31%
	RA-226	N/A			N/A			N/A			N/A			N/A			4.0E-08	6.54%	6.18%
	RA-228	N/A			N/A			N/A			N/A			N/A			1.1E-10	0.02%	0.02%
	SR-90	N/A			N/A			N/A			N/A			N/A			3.1E-07	51.12%	48.28%
	U-234	N/A			N/A			N/A			N/A			N/A			1.7E-07	28.15%	26.59%
	U-235/236	N/A			N/A			N/A			N/A			N/A			1.2E-09	0.19%	0.18%
	U-238	N/A			N/A			N/A			N/A			N/A			5.6E-08	9.04%	8.54%
	Total Radiological Risk																6.1E-07	98.56%	93.09%
	Arsenic	N/A			N/A			N/A			N/A			N/A			8.7E-09	1.41%	1.33%
	Benzo(a)anthracene	N/A			N/A			N/A			N/A			N/A			5.2E-12	0.00%	0.00%
	Benzo(a)pyrene	N/A			N/A			N/A			N/A			N/A			3.1E-11	0.01%	0.00%
	Beryllium	N/A			N/A			N/A			N/A			N/A			1.4E-10	0.02%	0.02%
	Dibenzo(a,h)anthracene	N/A			N/A			N/A			N/A			N/A			5.3E-11	0.01%	0.01%
	Total Chemical Risk																8.9E-09	1.44%	1.36%
	Total																6.2E-07	100.00%	94.46%
Ambient Radon		2.6E-08		0.00%	N/A			1.4E-06		0.05%	N/A			N/A			N/A		
ALL MEDIA		**6.4E-04**			**9.0E-06**			**2.8E-03**			**2.8E-10**			**4.2E-09**			**6.5E-07**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

TABLE B.3.4-33
FUTURE LAND USE
SOLID WASTE LANDFILL
SUMMARY OF TOTAL NONCARCINOGENIC HAZARD

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Surface Soil/	Antimony				N/D			N/D			N/D			N/D					
Air	Arsenic	1.2E-03	36.82%	0.43%	N/D			N/D			N/D			N/D			5.7E-02	83.32%	19.37%
	Beryllium	2.0E-03	63.18%	0.74%	N/D			N/D			N/D			N/D			1.1E-02	16.68%	3.88%
	Total	3.2E-03	100.00%	1.18%													6.8E-02	100.00%	23.25%
Sediment	Arsenic	8.6E-04	0.33%	0.31%	N/A			N/A			N/A			N/A			N/A		
	Beryllium	2.4E-03	0.91%	0.87%	N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	2.6E-01	98.75%	93.48%	N/A			N/A			N/A			N/A			N/A		
	Total	2.6E-01	100.00%	94.66%															
Surface	Arsenic	3.6E-04	3.16%	0.13%	N/A			N/A			N/A			N/A			N/A		
Water	Beryllium	4.7E-06	0.04%	0.00%	N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	1.1E-02	96.80%	4.03%															
	Total	1.1E-02	100.00%	4.16%															
GMR Surface	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
Water	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	U-Total	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Homegrown	Arsenic	N/A			3.8E-05	99.39%	68.25%	1.3E-06	99.60%	68.34%	1.5E-04	99.39%	74.97%	4.8E-06	99.76%	75.18%	9.6E-02	99.84%	32.90%
Produce	Beryllium	N/A			2.3E-07	0.61%	0.42%	5.0E-09	0.40%	0.27%	8.9E-07	0.61%	0.46%	1.2E-08	0.24%	0.18%	1.5E-04	0.16%	0.05%
(Dust		N/A																	
Affected)	*Total*				3.8E-05	100.00%	68.66%	1.3E-06	100.00%	68.62%	1.5E-04	100.00%	75.42%	4.8E-06	100.00%	75.36%	9.6E-02	100.00%	32.95%
Homegrown	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
Produce	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
(GMR Surface	U-Total	N/A			N/A			N/A			N/A			N/A			N/A		
Water		N/A			N/A			N/A			N/A			N/A			N/A		
Affected)	*Total*																		
Beef/Milk	Arsenic	N/A			1.7E-05	99.62%	31.22%	5.7E-07	99.62%	31.27%	4.8E-05	99.75%	24.51%	1.6E-06	99.75%	24.58%	1.3E-01	99.89%	43.75%
(Dust	Beryllium	N/A			6.6E-08	0.38%	0.12%	2.2E-09	0.38%	0.12%	1.2E-07	0.25%	0.06%	4.0E-09	0.25%	0.06%	1.4E-04	0.11%	0.05%
Affected)	*Total*				1.8E-05	100.00%	31.34%	5.8E-07	100.00%	31.38%	4.8E-05	100.00%	24.58%	1.6E-06	100.00%	24.64%	1.3E-01	100.00%	43.80%
Beef/Milk	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
(GMR Surface	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
Water	U-Total	N/A			N/A			N/A			N/A			N/A			N/A		
Affected)																			
	Total																		
ALL MEDIA		**2.7E-01**			**5.6E-05**			**1.8E-06**			**2.0E-04**			**6.4E-06**			**2.9E-01**		

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TABLE B.3.4-33
(continued)

Medium	Parameter	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Home-builder	% Total Medium Risk	% Total Receptor Risk	Great Miami River Rec User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Res User	% Total Medium Hazard	% Total Receptor Hazard	Great Miami River Ag. User	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/	Antimony							3.3E-01	67.69%	67.69%	N/A			N/A			N/A		
Air	Arsenic	2.1E-02	93.60%	17.29%	2.9E-01	93.60%	27.93%	1.5E-01	31.87%	31.87%	N/A			N/A			N/A		
	Beryllium	1.4E-03	6.40%	1.18%	2.0E-02	6.40%	1.91%	2.1E-03	0.44%	0.44%	N/A			N/A			N/A		
	Total	2.2E-02	100.00%	18.48%	3.1E-01	100.00%	29.84%	4.8E-01	100.00%	100.00%									
Sediment	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
	Beryllium	N/A			N/A			N/A			N/A			N/A			N/A		
	U-TOTAL	N/A			N/A			N/A			N/A			N/A			N/A		
	Total																		
Surface	Arsenic	N/A			N/A			N/A			N/A			N/A			N/A		
Water		N/A			N/A			N/A			N/A			N/A			N/A		
																	N/A		
	Total																		
GMR Surface	Arsenic	N/A			N/A			N/A			8.8E-08	77.73%	77.73%	2.1E-07	9.57%	9.57%	N/A		
Water	Beryllium	N/A			N/A			N/A			4.9E-11	0.04%	0.04%	2.6E-10	0.01%	0.01%	N/A		
	U-Total	N/A			N/A			N/A			2.5E-08	22.23%	22.23%	2.0E-06	90.42%	90.42%	N/A		
	Total										1.1E-07	100.00%	100.00%	2.2E-06	100.00%	100.00%			
Homegrown	Arsenic	4.1E-02	99.84%	34.58%	3.7E-01	99.84%	35.93%	N/A			N/A			N/A			N/A		
Produce	Beryllium	6.5E-05	0.16%	0.05%	5.8E-04	0.16%	0.06%	N/A			N/A			N/A			N/A		
(Dust								N/A			N/A			N/A			N/A		
Affected)	*Total*	4.1E-02	100.00%	34.63%	3.7E-01	100.00%	35.99%												
Homegrown	Arsenic	N/A			N/A			N/A			N/A			N/A			3.1E-05	40.25%	28.86%
Produce	Beryllium	N/A			N/A			N/A			N/A			N/A			1.7E-08	0.02%	0.02%
(GMR Surface	U-Total	N/A			N/A			N/A			N/A			N/A			4.6E-05	59.73%	42.82%
Water		N/A			N/A			N/A			N/A			N/A					
Affected)	*Total*																7.7E-05	100.00%	71.69%
Beef/Milk	Arsenic	5.6E-02	99.89%	46.84%	3.5E-01	99.92%	34.14%	N/A			N/A			N/A			N/A		
(Dust	Beryllium	6.4E-05	0.11%	0.05%	2.6E-04	0.08%	0.03%	N/A			N/A			N/A			N/A		
Affected)	*Total*	5.6E-02	100.00%	46.89%	3.5E-01	100.00%	34.17%												
Beef/Milk	Arsenic	N/A			N/A			N/A			N/A			N/A			1.6E-05	54.60%	15.46%
(GMR Surface	Beryllium	N/A			N/A			N/A			N/A			N/A			6.4E-09	0.02%	0.01%
Water	U-Total	N/A			N/A			N/A			N/A			N/A			1.4E-05	45.38%	12.85%
Affected)																			
	Total																3.0E-05	100.00%	28.31%
ALL MEDIA		**1.2E-01**			**1.0E+00**			**4.8E-01**			**1.1E-07**			**2.2E-06**			**1.1E-04**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - Not determined because toxicity data are not available.

TABLE B.3.5-1

LIME SLUDGE PONDS
EXPOSURE POINT CONCENTRATIONS FOR SCENARIOS EVALUATED

Current Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current Access Controls (current use of FEMP continues, DOE Ownership)	Trespassing Youth	surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit
		air	inhalation of particulates, radionuclides, volatiles, and gases	maximum estimated on-subunit current concentrations derived from airborne soil air modeling results
		surface water	incidental ingestion dermal contact	not quantified; surface water data not available
		sediment	incidental ingestion dermal contact external radiation	not quantified; sediment data not available
	Off-Property Resident Farmer (adult and child), homegrown produce off-property, livestock grazing off-property	air	inhalation of particulates, volatiles, and gases	maximum estimated off-property current concentrations derived from airborne soil air modeling concentrations
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property current concentrations derived from deposited airborne soil air modeling results
		livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property current concentrations derived from deposited airborne soil air modeling results
	Groundskeeper	air	inhalation of particulates, volatiles, and gases	maximum estimated on-subunit current concentration derived from air modeling
		soil	ingestion dermal contact external radiation	surface soil within subunit

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TABLE B.3.5-1
(Continued)

Current Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Current Access Controls (current use of FEMP continues, DOE Ownership) (contined)	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	not quantified; Lime Sludge Ponds do not impact Great Miami River
			fish	ingestion	not quantified; Lime Sludge Ponds do not impact Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruits and vegetables	not quantified; Lime Sludge Ponds do not impact Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	not quantified; Lime Sludge Ponds do not impact Great Miami River
		Household User	surface water	ingestion dermal contact inhalation	not quantified; Lime Sludge Ponds do not impact Great Miami River
Current Without Access Controls (current use of FEMP continues)	User of Meat and Milk Products		livestock (grazing on-property)	ingestion of milk and beef	maximum estimated on-property current concentrations derived from deposited airborne soil air modeling results

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TABLE B.3.5-1
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership	Future Off-Property Farmer (adult and child), homegrown produce off-property, livestock grazing off-property, groundwater off-property		air	inhalation of particulates, volatiles, and gases	maximum estimated off-property future concentrations derived from airborne soil air modeling results
			plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
			livestock (grazing at property boundary)	ingestion of milk and beef	maximum estimated off-property future concentrations derived from deposited airborne soil air modeling and groundwater modeling results
			groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations off-site at time when concentration is greatest
	Expanded Trespasser (youth)		air	inhalation of particulates, radionuclides, volatiles, and gases	maximum estimated on-subunit airborne modeling results
			surface water	incidental ingestion dermal contact	not quantified; surface water data not available
			sediment	incidental ingestion dermal contact external radiation	not quantified; sediment data not available
			soil	ingestion dermal contact external radiation	surface soil within subunit
	Great Miami River Users	Recreational User	surface water	ingestion dermal contact	not quantified; Lime Sludge Ponds do not impact Great Miami River
			fish	ingestion	not quantified; Lime Sludge Ponds do not impact Great Miami River
		Agricultural User	plants (homegrown produce irrigated with water from Great Miami River)	ingestion of fruit and vegetables	not quantified; Lime Sludge Ponds do not impact Great Miami River
			livestock (grazing on crops irrigated with water from Great Miami River)	ingestion of beef and milk	not quantified; Lime Sludge Ponds do not impact Great Miami River

TABLE B.3.5-1
(Continued)

Future Land Use	Receptor		Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Federal Ownership (Continued)	Great Miami River Users (continued)	Household User	surface water	ingestion dermal contact inhalation of particulates, volatiles, and gases	not quantified; Lime Sludge Ponds do not impact Great Miami River
Without Federal Ownership	Future On-Property (Solid Waste Landfill) Resident Farmer (adult and child), homegrown produce on-property, livestock grazing on-property, groundwater on-property, RME and CT estimates		air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-property future concentrations from airborne soil modeling results; indoor radon quantitated
			plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-property future concentrations derived from deposited airborne soil air modeling results and groundwater modeling results
			livestock (grazing on property)	ingestion of milk and beef	maximum estimated on-property future concentrations derived from deposited airborne soil air modeling results and groundwater modeling results
			groundwater	ingestion dermal contact inhalation	modeled groundwater concentrations underlying Lime Sludge Ponds at time when concentration is greatest
			surface soil	incidental ingestion dermal contact external radiation	surface soil within Lime Sludge Ponds
	Future Homebuilder		waste material/subsurface soil	external radiation incidental ingestion dermal contact	not quantified; no building on Lime Sludge Ponds anticipated
			air	inhalation of particulates, volatiles, and gases	not quantified; no building on Lime Sludge Ponds anticipated

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TABLE B.3.5-1
(Continued)

Future Land Use	Receptor	Direct Contact Medium	Route of Exposure	Exposure Point Concentration
Without Federal Ownership (Continued)	Future Perched Groundwater User homegrown produce on-property, livestock grazing on-property, groundwater on-property (Solid Waste Landfill and Lime Sludge Ponds only)	air	inhalation of particulates, volatiles, gases, and indoor radon	maximum estimated on-property future concentrations from airborne soil modeling results; indoor radon quantitated
		plants (homegrown produce)	ingestion of fruits and vegetables	maximum estimated on-property future concentrations derived from deposited airborne soil air modeling results and groundwater modeling results
	Future Perched Groundwater User homegrown produce on-property, livestock grazing on-property, groundwater on-property (Solid Waste Landfill and Lime Sludge Ponds only) (Continued)	livestock (grazing on-property)	ingestion of milk and beef	maximum estimated on-property future concentrations derived from deposited airborne soil air modeling results and groundwater modeling results
		perched groundwater directly underlying subunit	incidental ingestion, dermal contact, inhalation of volatiles released during household use	maximum modeled groundwater concentration in perched groundwater underlying the Lime Sludge Ponds
		surface soil	incidental ingestion dermal contact external radiation	surface soil within subunit

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B.3.5.2 Constituents of Potential Concern

The CPCs quantified for the Lime Sludge Pond surface soil and waste material are summarized in Table B.3.5-2 (a) and (b) respectively (Attachment B.III) along with relevant information regarding frequencies of detection data distribution, 95 percent UCLs, etc. Table B.3.5-3 summarizes CPCs for the Lime Sludge Ponds by medium.

B.3.5.3 Risk Characterization for Current Land Use

The scenarios characterized for the Lime Sludge Ponds assuming continued DOE ownership with access controls include a trespassing youth; the off-property farmer and resident child using food products from livestock grazing off-property and produce grown off-property; and an on-property groundskeeper contacting on-site contaminants in air and soil. In the event that the FEMP lost access controls, a current user of meat and milk product from livestock grazed on-property was also evaluated. The users of the Great Miami River receptors were not evaluated for the Lime Sludge Ponds because the Lime Sludge Ponds do not impact the Great Miami River.

B.3.5.3.1 Trespassing Youth

Risk was characterized for the trespassing youth contacting CPCs via ingestion and dermal contact with surface soil within the subunit; external radiation resulting from exposure to surface soil within the subunit; and inhalation of airborne particulates. Exposure point concentrations for the exposure to surface soil were based on analytical data while the inhaled particulate concentration was based on air modeling results as described in Section B.2.0, Appendix A, and Section 5.0 of this RI report.

Risks and hazards calculated for the trespassing youth exposed to contaminants in surface soil are presented in Table B.3.5-4 (Attachment B.III). Total risk due to all CPCs in surface soil by all routes of exposure was 1.1×10^{-5}. This was primarily due to external radiation from radium-226 (2.5×10^{-6}), radium-228 (1.0×10^{-6}) thorium-228 (3.5×10^{-6}), and thorium-232 (2.4×10^{-6}). Total chemical HIs calculated for a trespassing youth exposed to CPCs in soil did not exceed HI of 1.0.

B.3.5.3.2 Current Off-Property Farmers

Risks were characterized for the off-property farmer and resident child contacting CPCs via inhalation of airborne particulates and ingestion of homegrown produce on which airborne particulates were deposited; and ingestion of milk and beef from livestock grazing on off-site grasses on which airborne

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TABLE B.3.5-3

LIME SLUDGE PONDS
OPERABLE UNIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Surface Soil	Waste Material	Perched Water	Groundwater (GMA)
arsenic	arsenic	neptunium-237	technetium-99
beryllium	beryllium	strontium-90	
lead	lead	technetium-99	
cesium-137	cesium-137	arsenic	
neptunium-237	neptunium-237	1,1,2-trichlorotrifluoroethane	
plutonium-238	plutonium-238	1,2-diethylbenzene	
plutonium-239/240	plutonium-239/240		
radium-226	radium-226		
radium-228	radium-228		
strontium-90	strontium-90		
thorium-228	technetium-99		
thorium-230	thorium-228		
thorium-232	thorium-230		
thorium-total	thorium-total		
uranium-234	uranium-234		
uranium-235/236	uranium-235/236		
uranium-238	uranium-238		
uranium-total	Aroclor-1254		
Aroclor-1254	benzo(g,h,i)perylene		
benzo(a)anthracene	dibenzo(a,h)anthracene		
benzo(a)pyrene	ideno(1,2,3-cd)pyrene		
benzo(b)fluoranthene	phenanthrene		
benzo(g,h,i)perylene	1,1,2trichlorotriflurorethane		
bis(2-Ethylhexyl)phthalate	1,2-diethylbenzene		
dibenzo(a,h)anathracene	acrylonitrile		
ideno(1,2,3-cd)pyrene			
phenanthrene			

particulates were deposited. For all of these routes of exposure, the exposure point concentration was based on air modeling results as described in Section B.2.0, Methodology.

The risks and hazards calculated for the off-property farmer and resident child exposed to surface soil are presented in Tables B.3.5-5(a) and B.3.5-5(b), respectively (Attachment B.III). The total risk associated with CPCs in surface soil was 1.3×10^{-7} and 2.4×10^{-9} for the farmer and child, respectively. Total HIs were below 1.0.

Risks and hazards associated with ingestion of CPCs in beef and milk for the off-property farmer and resident child are given in Tables B.3.5-6(a) and B.3.5-6(b), respectively (Attachment B.III). Total risk for all CPCs consumed in beef and milk was 1.7×10^{-8} and $10 \times^{-7}$ for the farmer and child, respectively. Total HIs for all CPCs consumed in beef and milk were well below 1.0 for both the farmer and child.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-site farmer and resident child are given in Tables B.3.5-7(a) and B.3.5-7(b), respectively (Attachment B.III). Total risk for all CPCs consumed in homegrown produce was 6.8×10^{-9} and 1.9×10^{-9} for the farmer and child, respectively. Total HIs for all CPCs consumed in homegrown produce were well below 1.0 for both the farmer and child.

B.3.5.3.3 Current User of Meat and Milk Products

Risk was characterized for a current user of milk and meat products from livestock potentially grazing within the Lime Sludge Ponds boundaries. Exposure point concentrations in meat and milk were derived from the maximum on-property current deposition rates of airborne Lime Sludge Ponds surface soil. Risks and hazards to the current user of meat and milk products from livestock grazing on-property are summarized in Table B.3.5-8 (Attachment B.III). Total risk was 1.4×10^{-6} due to the cumulative presence of all CPCs. Total HI was below 1.0.

B.3.5.3.4 Current Groundskeeper

Risks and hazards to the current groundskeeper are given in Table B.3.5-9 (Attachment B.III). Total risk from soil was 4.5×10^{-5} due primarily from external exposure to radium-226 (9.3×10^{-6}), radium-228 (3.8×10^{-6}), thorium-228 (1.3×10^{-5}), thorium-232 (9.0×10^{-6}), and uranium-238 (3.9×10^{-6}). The HI was less than 1.0.

B.3.5.4 Risk Characterization for Future Land Use

The future scenarios characterized for the Lime Sludge Ponds assuming continued federal ownership are the off-property farmer and resident child and an expanded trespasser. Future scenarios characterized for the Lime Sludge Ponds assuming private ownership are an on-property farmer and resident child living and farming adjacent (outside the subunit battery limit) to the Lime Sludge Ponds. Risks for a future homebuilder were not evaluated because no building directly on the Lime Sludge Ponds is anticipated. Risks for a future perched groundwater user were evaluated for use of perched water directly underlying the subunit. Recreational users of the Great Miami River were evaluated for federal and private ownerships.

B.3.5.4.1 Future Off-Property Farmers

For the off-property farmer and resident child, risks were calculated for exposure to CPCs in airborne Lime Sludge Pond soil particulates. Receptors were assumed to contact CPCs in air via inhalation of airborne particulates; by consumption of homegrown produce on which airborne Lime Sludge Pond soil was deposited; and by ingestion of milk and beef from cattle grazing on grasses on which airborne Lime Sludge Pond soil was deposited and which was watered with contaminated groundwater. All of the exposure point concentrations for this scenario were derived from air modeling results as described in the methods Section B.2.0.

The risks and hazards calculated for the off-property farmer and resident child (private and federal ownership) exposed to surface soil in the Lime Sludge Ponds are presented in Tables B.3.5-10(a), B.3.5-10(b), B.3.5-10(c), and B.3.5-10(d), respectively (Attachment B.III). Total risk associated with CPCs in surface soil was 1.3×10^{-7} and 2.4×10^{-9} for the farmer and child (private and federal ownership), respectively. This was due mostly to ingestion and external radiation from radionuclides. HIs were below 1.0.

Risks and hazards associated with ingestion of CPCs in beef and milk for the future off-property farmer and resident child (private and federal ownership) are given in Tables B.3.5-11(a), B.3.5-11(b), B.3.5-11(c), B.3.5-11(d), respectively (Attachment B.III). Total risk for all CPCs consumed in beef and milk was 2.5×10^{-8} and 1.1×10^{-8} for the farmer and child (private and federal ownership), respectively. Total HIs for all CPCs consumed in beef and milk were well below of 1.0 for both the farmer and child.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the off-property farmer and resident child (private and federal ownership) are given in Tables B.3.5-12(a), B.3.5-12(b), B.3.5-12(c), and B.3.5-12(d), respectively (Attachment B.III). Total risk for all CPCs consumed in homegrown produce was 6.8×10^{-9} and 1.9×10^{-9} for the farmer and child (private and federal ownership), respectively. Total HIs for all CPCs consumed in homegrown produce were well below 1.0 for both the farmer and child.

Risks and hazards associated with groundwater exposure for the off-property farmer and resident child (private and federal ownership) are summarized in Tables B.3.5-13(a), B.3.5-13(b), B.3.5-13(c), and B.3.5-13(d), respectively (Attachment B.III). Risks were 1.1×10^{-8} and 4.6×10^{-10}, respectively. HIs from soil were below 1.0.

B.3.5.4.2 Future Expanded Trespasser

Risks to the future expanded trespasser were calculated for exposure to CPCs detected on-subunit. The expanded trespasser was anticipated to contact CPCs directly via inhalation of airborne particulates; ingestion of and dermal contact with on-subunit soil; and external radiation resulting from exposure to contaminated on-subunit surface soil. The exposure point concentrations for inhalation of airborne Lime Sludge Pond soil particles were estimated from airborne soil modeling results, while surface soil exposure point concentrations were based on analytical data.

Risks and hazards associated with expanded trespasser contact with on-subunit surface water and sediment were not quantified since no surface water or sediment samples within the Lime Sludge Ponds were available.

Risks and hazards calculated for the expanded trespasser due to direct exposure to soil and airborne particulates are presented in Table B.3.5-14 (Attachment B.III). Total risk due to exposure to all CPCs in surface soil by all exposure pathways was 2.4×10^{-5}. This was primarily due primarily to direct radiation exposure to radium-226 (5.2×10^{-6}), radium-228 (2.1×10^{-6}), thorium-232 (5.0×10^{-6}), thorium-228 (7.3×10^{-6}) and uranium-238 (1.5×10^{-6}). Total HIs calculated for exposure of an expanded trespasser to CPCs in soil at the Lime Sludge Ponds did not exceed 1.0.

B.3.5.4.3 Future On-Property Farmers

Risks were quantified for the future on-property farmer and resident child living and farming adjacent to the Lime Sludge Ponds and using groundwater underlying the subunit. The on-property framer was located adjacent (e.g., outside the subunit battery (limits) because the Lime Sludge Ponds are considered insufficiently stable to support a farm house or agriculture activities. Risks were calculated for inhalation of airborne particulates; direct contact with groundwater via ingestion, inhalation and dermal contact; ingestion of homegrown produce on which airborne Lime Sludge Pond, surface soil was deposited; and ingestion of milk and beef from livestock grazing on grasses on which airborne Lime Sludge Pond, surface soil was deposited. Risks from (direct contact) surface soil exposure were not evaluated because the farmers does not reside or farm directly on the subunit. Exposure point concentrations for these routes of exposure were based on air and groundwater modeling as described in Section B.2.0. Both RME and CT risks and hazards were estimated for the on-property farmer.

Risks and hazards calculated for the on-property RME farmer and resident child exposed to soil via inhalation are presented in Tables B.3.5-15(a) and B.3.5-15(b), respectively (Attachment B.III). Total risk associated with future exposure to soil was 1.1×10^{-5} and 2.0×10^{-7} for the farmer and child, respectively. For the RME farmer, this risk was primarily due to inhalation of thorium-230 and uranium-238 which had calculated risks of 2.3×10^{-6} and 6.4×10^{-6} respectively. There were no HIs greater than 1.0.

Risks and hazards associated with ingestion of CPCs in beef and milk for the on-property RME farmer and resident child are given in Tables B.3.5-16(a) and B.3.5-16(b), respectively, (Attachment B.III). Total risk for all CPCs consumed in beef and milk was 1.5×10^{-6} and 7.7×10^{-7} for the RME farmer and child, respectively. Total HIs for all CPCs consumed in beef and milk was well below 1.0 for both the farmer and child.

Risks and hazards associated with ingestion of CPCs in homegrown produce for the on-property RME farmer and resident child are given in Tables B.3.5-17(a) and B.3.5-17(b), respectively (Attachment B.III). Total risk for all CPCs consumed in homegrown produce was 6.5×10^{-7} and 1.6×10^{-7} for the RME farmer and child, respectively. Total HIs for all other CPCs consumed in homegrown produce were well below 1.0 for both the RME farmer and child.

Risks and hazards calculated due to contact with groundwater are presented in Tables B.3.5-17(c) and B.3.5-17(d)[Attachment B.III] for the on-property farmer and child, respectively. Total risk associated with future exposure to technetium-99 in groundwater was 1.9×10^{-7} and 8.1×10^{-9} for the farmer and child, respectively. There were no HIs greater that 1.0 associated with this medium.

CT estimates of risk and hazard for the future on-property farmer associated with exposures to surface soil, homegrown produce, beef and milk, and groundwater are given in Tables B.3.5-18, B.3.5-19, B.3.5-20, and B.3.5-21 respectively (Attachment B.III). All risks were below 1.0×10^{-6}. All calculated HIs were below 1.0.

B.3.5.4.4 Future On-Property Perched Groundwater User

Risk and hazard to a user of perched groundwater underlying the Lime Sludge Ponds are given in Tables B.3.5-22 for the farmer. Risks were calculated for inhalation of airborne particulates estimated from air modeling results of the Lime Sludge Ponds; ingestion of homegrown produce on which airborne surface soil was deposited and was irrigated will contaminated perched water; ingestion of milk and beef from livestock consuming vegetation on which airborne surface soil was deposited and drinking contaminated perch water directly underlying the Lime Sludge Ponds. Total risk from exposure to surface soil via inhalation was 1.1×10^{-5} due mostly to the presence of thorium-230 (2.3×10^{-6}) and uranium-238 (6.4×10^{-6}). total risk from exposure to perched water was 6.4×10^{-5} due mostly to the presence of neptunium-237 (5.5×10^{-5}), strontium-90 (3.4×10^{-6}), and technetium-99 (5.2×10^{-6}). HIs were below 1.0.

B.3.5.5 Risks Due to Radium-222 Emission

Risks due to eminent exposures to outdoor radon emissions attributable to the Lime Sludge Ponds are summarized on Table B.3.5-24.. All estimated subunit specific risks are below 1.0×10^{-6}.

B.3.5.6 Summary Lime Sludge Ponds

Tables B.3.5-25 and B.3.5-26 summarize risk and hazard, respectively, associated with Lime Sludge Pond receptors assuming current land use. Total receptor risk to the trespassing youth exceeded 1.0×10^{-6} due primarily to external radiation exposure to surface soil containing radium-226, radium-228, thorium-228, thorium-232 and uranium-238 which accounted for approximately 88 percent of the total receptor risk.

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TABLE B.3.5-24
LIME SLUDGE PONDS
RISKS DUE TO ESTIMATED RN-222 EMISSION

	Subunit			Background		
	Maximum RN-222 Air Concentration (pCi/m3)*	Intake (pCi)	Risk	Background RN-222 Air Concentration (pCi/m3)**	Intake (pCi)	Risk
Current Trespassing Youth	3.9E-01	8.1E+02	6.3E-09	1.4E+00	2.8E+03	2.2E-08
Current/Future Off-Property Farmer	3.0E-03	3.5E+02	2.7E-09	1.0E-02	1.2E+03	9.3E-09
Current/Future Off-Property Child	3.0E-03	6.3E+00	4.9E-11	1.0E-02	2.2E+01	1.7E-10
Current Groundskeeper	3.9E-01	6.9E+03	5.3E-08	1.4E+00	2.4E+04	1.8E-07
Future Expanded Trespasser (Adult+ Child)	3.9E-01	1.3E+03	9.8E-09	1.4E+00	4.4E+03	3.4E-08
Future, RME On-Property Farmer	3.9E-01	4.5E+04	3.5E-07	1.4E+00	1.6E+05	1.2E-06
Future, CT On-Property Farmer	3.9E-01	3.3E+03	2.6E-08	1.4E+00	1.2E+04	8.9E-08
Future, On-Property Child	3.9E-01	8.2E+02	6.3E-09	1.4E+00	2.8E+03	2.2E-08

*Represents upper 95 percent confidence interval on the mean Ra-226 concentration.
**Assumes RA-226 concentration is 1.228 pCi/g in surface soil and 0.78 pCi/g in subsurface soil.

TABLE B.3.5-25
CURRENT LAND USE
LIME SLUDGE PONDS
SUMMARY OF CARCINOGENIC RISK

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Surface Soil/Air	CS-137	3.0E-07	2.63%	2.63%	2.7E-13	0.00%	0.00%	4.9E-15	0.00%	0.00%
	NP-237	6.9E-08	0.61%	0.61%	4.3E-10	0.34%	0.28%	7.8E-12	0.33%	0.06%
	PU-238	2.7E-09	0.02%	0.02%	4.6E-10	0.37%	0.30%	8.4E-12	0.35%	0.06%
	PU-239/240	6.5E-10	0.01%	0.01%	1.1E-10	0.08%	0.07%	1.9E-12	0.08%	0.01%
	RA-226	2.5E-06	21.74%	21.73%	2.8E-10	0.22%	0.18%	5.0E-12	0.21%	0.04%
	RA-228	1.0E-06	8.93%	8.92%	2.3E-11	0.02%	0.02%	4.2E-13	0.02%	0.00%
	SR-90	3.4E-10	0.00%	0.00%	1.0E-12	0.00%	0.00%	1.8E-14	0.00%	0.00%
	TH-228	3.5E-06	30.65%	30.63%	4.7E-09	3.72%	3.06%	8.4E-11	3.57%	0.61%
	TH-230	7.7E-08	0.68%	0.68%	2.7E-08	21.31%	17.53%	4.8E-10	20.41%	3.47%
	TH-232	2.4E-06	20.95%	20.94%	2.9E-09	2.35%	1.94%	5.3E-11	2.26%	0.38%
	U-234	3.4E-08	0.29%	0.29%	1.1E-08	8.96%	7.37%	2.0E-10	8.58%	1.46%
	U-235/236	9.2E-08	0.81%	0.81%	9.0E-10	0.72%	0.59%	1.6E-11	0.69%	0.12%
	U-238	7.7E-07	6.78%	6.78%	7.6E-08	60.71%	49.94%	1.4E-09	58.15%	9.88%
	Total Radiological Risk	1.1E-05	94.09%	94.04%	1.2E-07	98.80%	81.28%	2.2E-09	94.64%	16.08%
	Aroclor-1254	9.2E-08	0.80%	0.80%						
	Arsenic	1.7E-07	1.51%	1.51%	1.2E-09	0.99%	0.81%	1.0E-10	4.41%	0.75%
	Benzo(a)pyrene	1.7E-07	1.52%	1.52%	7.7E-11	0.06%	0.05%	6.5E-12	0.28%	0.05%
	Benzo(a)anthracene	1.4E-08	0.13%	0.13%	6.4E-12	0.01%	0.00%	5.4E-13	0.02%	0.00%
	Benzo(b)fluoranthene	1.6E-08	0.14%	0.14%	7.0E-12	0.01%	0.00%	5.9E-13	0.03%	0.00%
	bis(2-Ethylhexyl)phthalate	2.8E-09	0.02%	0.02%						
	Beryllium	1.4E-07	1.24%	1.24%	1.5E-10	0.12%	0.10%	1.2E-11	0.52%	0.09%
	Dibenzo(a,h)anthracene	5.1E-08	0.44%	0.44%	2.2E-11	0.02%	0.01%	1.9E-12	0.08%	0.01%
	Indeno(1,2,3-cd)pyrene	1.1E-08	0.10%	0.10%	5.1E-12	0.00%	0.00%	4.3E-13	0.02%	0.00%
	Total Chemical Risk	6.7E-07	5.91%	5.91%	1.5E-09	1.20%	0.99%	1.3E-10	5.36%	0.91%
	Total	1.1E-05	100.00%	99.95%	1.3E-07	100.00%	82.26%	2.4E-09	100.00%	16.99%

TABLE B.3.5-25
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Grounds-keeper	% Total Medium Risk	% Total Receptor Risk
Surface Soil/Air	CS-137	N/A			1.1E-06	2.52%	2.52%
	NP-237	N/A			2.7E-07	0.61%	0.61%
	PU-238	N/A			2.1E-08	0.05%	0.05%
	PU-239/240	N/A			5.1E-09	0.01%	0.01%
	RA-226	N/A			9.3E-06	20.97%	20.94%
	RA-228	N/A			3.8E-06	8.56%	8.55%
	SR-90	N/A			2.5E-09	0.01%	0.01%
	TH-228	N/A			1.3E-05	29.49%	29.45%
	TH-230	N/A			6.4E-07	1.44%	1.44%
	TH-232	N/A			9.0E-06	20.16%	20.13%
	U-234	N/A			2.8E-07	0.62%	0.62%
	U-235/236	N/A			3.6E-07	0.80%	0.80%
	U-238	N/A			3.9E-06	8.80%	8.79%
	Total Radiological Risk				4.2E-05	94.03%	93.92%
	Aroclor-1254	N/A			1.2E-07	0.28%	0.28%
	Arsenic	N/A			6.8E-07	1.53%	1.52%
	Benzo(a)pyrene	N/A			7.9E-07	1.77%	1.76%
	Benzo(a)anthracene	N/A			6.5E-08	0.15%	0.15%
	Benzo(b)fluoranthene	N/A			7.2E-08	0.16%	0.16%
	bis(2-Ethylhexyl)phthalate	N/A			8.4E-09	0.02%	0.02%
	Beryllium	N/A			6.4E-07	1.44%	1.44%
	Dibenzo(a,h)anthracene	N/A			2.3E-07	0.51%	0.51%
	Indeno(1,2,3-cd)pyrene	N/A			5.2E-08	0.12%	0.12%
	Total Chemical Risk				2.7E-06	5.97%	5.96%
	Total				4.5E-05	100.00%	99.88%

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TABLE B.3.5-25
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Fruits and Vegetables, Dust Affected)	CS-137	N/A			7.2E-12	0.11%	0.00%	5.1E-13	0.03%	0.00%
	NP-237	N/A			4.2E-11	0.61%	0.03%	3.0E-12	0.16%	0.02%
	PU-238	N/A			3.3E-11	0.48%	0.02%	2.3E-12	0.12%	0.02%
	PU-239/240	N/A			8.1E-12	0.12%	0.01%	5.7E-13	0.03%	0.00%
	RA-226	N/A			4.0E-10	5.90%	0.26%	2.8E-11	1.51%	0.20%
	RA-228	N/A			4.3E-11	0.63%	0.03%	3.0E-12	0.16%	0.02%
	SR-90	N/A			8.3E-12	0.12%	0.01%	5.8E-13	0.03%	0.00%
	TH-228	N/A			4.1E-11	0.61%	0.03%	2.9E-12	0.15%	0.02%
	TH-230	N/A			1.6E-10	2.27%	0.10%	1.1E-11	0.58%	0.08%
	TH-232	N/A			5.9E-11	0.87%	0.04%	4.2E-12	0.22%	0.03%
	U-234	N/A			8.8E-11	1.29%	0.06%	6.2E-12	0.33%	0.04%
	U-235/236	N/A			7.3E-12	0.11%	0.00%	5.1E-13	0.03%	0.00%
	U-238	N/A			5.2E-10	7.63%	0.34%	3.7E-11	1.95%	0.26%
	Total Radiological Risk				1.4E-09	20.74%	0.93%	1.0E-10	5.31%	0.72%
	Aroclor-1254	N/A			2.5E-10	3.67%	0.16%	8.2E-11	4.38%	0.59%
	Arsenic	N/A			2.3E-09	33.06%	1.48%	7.4E-10	39.52%	5.33%
	Benzo(a)pyrene	N/A			1.2E-09	17.88%	0.80%	4.0E-10	21.34%	2.88%
	Benzo(a)anthracene	N/A			1.0E-10	1.52%	0.07%	3.4E-11	1.82%	0.25%
	Benzo(b)fluoranthene	N/A			1.1E-10	1.61%	0.07%	3.6E-11	1.92%	0.26%
	bis(2-Ethylhexyl)phthalate	N/A			2.0E-11	0.30%	0.01%	6.7E-12	0.36%	0.05%
	Beryllium	N/A			1.0E-09	14.98%	0.67%	3.4E-10	17.90%	2.42%
	Dibenzo(a,h)anthracene	N/A			3.5E-10	5.09%	0.23%	1.1E-10	6.08%	0.82%
	Indeno(1,2,3-cd)pyrene	N/A			7.9E-11	1.15%	0.05%	2.6E-11	1.37%	0.19%
	Total Chemical Risk				5.4E-09	79.26%	3.56%	1.8E-09	94.69%	12.78%
	Total				6.8E-09	100.00%	4.49%	1.9E-09	100.00%	13.50%

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TABLE B.3.5-25
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Grounds-keeper	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Fruits and Vegetables, Dust Affected)	CS-137	N/A			N/A		
	NP-237	N/A			N/A		
	PU-238	N/A			N/A		
	PU-239/240	N/A			N/A		
	RA-226	N/A			N/A		
	RA-228	N/A			N/A		
	SR-90	N/A			N/A		
	TH-228	N/A			N/A		
	TH-230	N/A			N/A		
	TH-232	N/A			N/A		
	U-234	N/A			N/A		
	U-235/236	N/A			N/A		
	U-238	N/A			N/A		
	Total Radiological Risk						
	Aroclor-1254	N/A			N/A		
	Arsenic	N/A			N/A		
	Benzo(a)pyrene	N/A			N/A		
	Benzo(a)anthracene	N/A			N/A		
	Benzo(b)fluoranthene	N/A			N/A		
	bis(2-Ethylhexyl)phthalate	N/A			N/A		
	Beryllium	N/A			N/A		
	Dibenzo(a,h)anthracene	N/A			N/A		
	Indeno(1,2,3-cd)pyrene	N/A			N/A		
	Total Chemical Risk						
	Total						

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TABLE B.3.5-25
(continued)

Medium	Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Farmer	% Total Medium Risk	% Total Receptor Risk	Off-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Dust Affected)	CS-137	N/A			3.5E-11	0.20%	0.02%	4.4E-12	0.05%	0.03%
	NP-237	N/A			1.9E-13	0.00%	0.00%	1.5E-14	0.00%	0.00%
	PU-238	N/A			1.9E-15	0.00%	0.00%	2.0E-16	0.00%	0.00%
	PU-239/240	N/A			4.9E-16	0.00%	0.00%	5.2E-17	0.00%	0.00%
	RA-226	N/A			7.1E-11	0.41%	0.05%	1.2E-11	0.13%	0.09%
	RA-228	N/A			5.0E-12	0.03%	0.00%	8.7E-13	0.01%	0.01%
	SR-90	N/A			6.5E-12	0.04%	0.00%	1.2E-12	0.01%	0.01%
	TH-228	N/A			5.6E-14	0.00%	0.00%	8.8E-15	0.00%	0.00%
	TH-230	N/A			9.9E-13	0.01%	0.00%	1.6E-13	0.00%	0.00%
	TH-232	N/A			3.8E-13	0.00%	0.00%	5.9E-14	0.00%	0.00%
	U-234	N/A			1.2E-11	0.07%	0.01%	2.2E-12	0.02%	0.02%
	U-235/236	N/A			1.0E-12	0.01%	0.00%	1.9E-13	0.00%	0.00%
	U-238	N/A			7.3E-11	0.42%	0.05%	1.3E-11	0.14%	0.10%
	Total Radiological Risk				2.1E-10	1.18%	0.13%	3.5E-11	0.36%	0.25%
	Aroclor-1254	N/A			1.6E-09	9.42%	1.08%	9.5E-10	9.81%	6.79%
	Arsenic	N/A			7.8E-10	4.49%	0.52%	1.8E-10	1.92%	1.33%
	Benzo(a)pyrene	N/A			4.9E-09	28.17%	3.23%	2.8E-09	29.33%	20.29%
	Benzo(a)anthracene	N/A			1.5E-10	0.88%	0.10%	8.8E-11	0.91%	0.63%
	Benzo(b)fluoranthene	N/A			4.6E-10	2.63%	0.30%	2.6E-10	2.74%	1.89%
	bis(2-Ethylhexyl)phthalate	N/A			4.3E-10	2.48%	0.28%	2.5E-10	2.58%	1.79%
	Beryllium	N/A			1.2E-10	0.67%	0.08%	1.8E-11	0.19%	0.13%
	Dibenzo(a,h)anthracene	N/A			7.8E-09	44.63%	5.12%	4.5E-09	46.48%	32.14%
	Indeno(1,2,3-cd)pyrene				9.5E-10	5.45%	0.63%	5.5E-10	5.68%	3.93%
	Total Chemical Risk				1.7E-08	98.82%	11.34%	9.6E-09	99.64%	68.91%
	Total				1.7E-08	100.00%	11.48%	9.6E-09	100.00%	69.16%
Ambient Radon		6.3E-09		0.05%	2.7E-09		1.77%	4.9E-11		0.35%
ALL MEDIA		**1.1E-05**			**1.5E-07**			**1.4E-08**		

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TABLE B.3.5-25
(continued)

Medium	Parameter	User of Milk and Meat	% Total Medium Risk	% Total Receptor Risk	Grounds-keeper	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Dust Affected)	CS-137	2.9E-09	0.21%	0.21%	N/A		
	NP-237	3.6E-11	0.00%	0.00%	N/A		
	PU-238	2.0E-13	0.00%	0.00%	N/A		
	PU-239/240	1.3E-13	0.00%	0.00%	N/A		
	RA-226	1.7E-08	1.20%	1.20%	N/A		
	RA-228	4.3E-10	0.03%	0.03%	N/A		
	SR-90	1.4E-09	0.10%	0.10%	N/A		
	TH-228	4.8E-12	0.00%	0.00%	N/A		
	TH-230	9.2E-11	0.01%	0.01%	N/A		
	TH-232	3.2E-11	0.00%	0.00%	N/A		
	U-234	1.4E-09	0.10%	0.10%	N/A		
	U-235/236	1.2E-10	0.01%	0.01%	N/A		
	U-238	8.3E-09	0.60%	0.60%	N/A		
	Total Radiological Risk	3.1E-08	2.27%	2.27%			
	Aroclor-1254	1.8E-08	1.32%	1.32%	N/A		
	Arsenic	6.7E-08	4.81%	4.81%	N/A		
	Benzo(a)pyrene	4.2E-07	30.01%	30.01%	N/A		
	Benzo(a)anthracene	1.3E-08	0.94%	0.94%	N/A		
	Benzo(b)fluoranthene	3.9E-08	2.80%	2.80%	N/A		
	bis(2-Ethylhexyl)phthalate	3.7E-08	2.64%	2.64%	N/A		
	Beryllium	2.6E-08	1.84%	1.84%	N/A		
	Dibenzo(a,h)anthracene	6.6E-07	47.58%	47.58%	N/A		
	Indeno(1,2,3-cd)pyrene	8.0E-08	5.79%	5.79%			
	Total Chemical Risk	1.4E-06	97.73%	97.73%			
	Total	1.4E-06	100.00%	100.00%			
Ambient Radon		N/A			5.3E-08		0.12%
ALL MEDIA		**1.4E-06**			**4.5E-05**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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TABLE B.3.5-26
CURRENT LAND USE
LIME SLUDGE PONDS
SUMMARY OF NONCARCINOGENIC HAZARD

Medium	Parameter	Trespassing Youth	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Resident Farmer	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/Air	Arsenic	1.9E-03	0.89%	0.89%	N/D		
	bis(2-Ethylhexyl)phthalate	5.9E-05	0.03%	0.03%	N/D		
	Beryllium	4.2E-03	2.03%	2.03%	N/D		
	U-TOTAL	2.0E-01	97.06%	97.06%	N/D		
	Total	2.1E-01	100.00%	100.00%			
Homegrown Produce (Fruits and Vegetables, Dust Affected)	Arsenic	N/A			4.3E-06	27.79%	20.99%
	bis(2-Ethylhexyl)phthalate	N/A			7.3E-08	0.47%	0.36%
	Beryllium	N/A			4.8E-08	0.31%	0.23%
	U-TOTAL	N/A			1.1E-05	71.43%	53.94%
	Total				1.5E-05	100.00%	75.52%
Beef/Milk (Dust Affected)	Arsenic	N/A			1.5E-06	29.80%	7.29%
	bis(2-Ethylhexyl)phthalate	N/A			1.5E-06	30.81%	7.54%
	Beryllium	N/A			5.4E-09	0.11%	0.03%
	U-TOTAL	N/A			2.0E-06	39.28%	9.62%
	Total				5.0E-06	100.00%	24.48%
ALL MEDIA		**2.1E-01**			**2.0E-05**		

CC0401

TABLE B.3.5-26
(continued)

Medium	Parameter	Off-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard	User of Milk and Meat	% Total Medium Hazard	% Total Receptor Hazard	Grounds-keeper	% Total Medium Hazard	% Total Receptor Hazard
Surface Soil/Air	Arsenic	N/D			N/A			3.5E-03	2.71%	2.71%
	bis(2-Ethylhexyl)phthalate	N/D			N/A			8.4E-05	0.07%	0.07%
	Beryllium	N/D			N/A			2.4E-03	1.90%	1.90%
	U-TOTAL	N/D			N/A			1.2E-01	95.33%	95.33%
	Total							1.3E-01	100.00%	100.00%
Homegrown	Arsenic	1.7E-05	27.79%	17.68%	N/A			N/A		
Produce	bis(2-Ethylhexyl)phthalate	2.8E-07	0.47%	0.30%	N/A			N/A		
(Fruits and	Beryllium	1.8E-07	0.31%	0.20%	N/A			N/A		
Vegetables, Dust	U-TOTAL	4.2E-05	71.43%	45.43%	N/A			N/A		
Affected)	*Total*	5.9E-05	100.00%	63.61%						
Beef/Milk	Arsenic	4.1E-06	12.07%	4.39%	1.3E-04	29.85%	29.85%	N/A		
(Dust Affected)	bis(2-Ethylhexyl)phthalate	1.0E-05	30.49%	11.09%	1.3E-04	30.77%	30.77%	N/A		
	Beryllium	1.0E-08	0.03%	0.01%	1.2E-06	0.28%	0.28%	N/A		
	U-TOTAL	2.0E-05	57.41%	20.89%	1.7E-04	39.10%	39.10%	N/A		
	Total	3.4E-05	100.00%	36.39%	4.3E-04	100.00%	100.00%			
ALL MEDIA		**9.3E-05**			**4.3E-04**			**1.3E-01**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - Not determined because toxicity data not available.

000102

6502

Total receptor risk to the current groundskeeper exposed to soil was 4.5×10^{-5} due mostly to the presence of radium-226, radium-228, thorium-228, thorium-232, and uranium-238 which accounted for approximately 88 percent of total receptor risk. All calculated HIs were below 1.0.

Tables B.3.5-27 and B.3.5-28 summarize risks and hazards, respectively, associated with Lime Sludge Pond receptors assuming future land use. Total receptor risks to the off-property farmer and child (private and federal ownership) were below 1.0×10^{-6} and HIs were well below 1.0. Total risks to the on-property RME farmer and resident child exceed 1.0×10^{-5}. Risk to the on-property RME farmer was due primarily from thorium-230 and uranium-238 which contributed about 66 percent of the total receptor risk. Other major contributor to total risk to this receptor include beef and milk affected by dust. cumulative risk from CPCs in dust pose a 1.4×10^{-6} risk which is approximately 10 percent of the total receptor risk. Total HI was below 1.0.

Risk to the on-property child was due mostly to ingestion of dust affected beef and milk which accounted for 64.7 percent of the total receptor risk. No single CPC posed a risk greater than 1.0×10^{-6}, total receptor risk was due to the accumulative presence of various CPCs in surface soil and dust affected homegrown produce and beef and milk. Total HI was below 1.0.

Total receptor risk to the CT on-property farmer was 9.2×10^{-7} and hi was below 1.0.

Total receptor risk to the perched groundwater user was 7.7×10^{-5} due mostly to thorium-232, and uranium-238 in surface soil which accounted for approximately 11.6 percent of the total receptor risk and neptunium-237, strontium-90, and technetium-99 in perched water which accounted for 82 percent of the total receptor risk.

Total risk to the expanded trespasser was 2.2×10^{-5} due to radium-226, radium-228, thorium-228, and thorium-232 which accounted for approximately 88 percent of the total receptor risk. Total HIs were less than 1.0.

B.3.6 OPERABLE UNIT 2 CUMULATIVE RISK

In order to assess the cumulative impact of contaminants present in all Operable Unit 2 subunits future receptors were assumed to be exposed to contaminants via their presence in:

000203

TABLE B.3.5-27
FUTURE LAND USE
LIME SLUDGE PONDS
SUMMARY OF CARCINOGENIC RISK

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk
Soil/Air	CS-137	6.3E-07	2.62%	2.62%	2.7E-13	0.00%	0.00%	2.7E-13	0.00%	0.00%	4.9E-15	0.00%	0.00%	4.9E-15	0.00%	0.00%
	NP-237	1.5E-07	0.61%	0.61%	4.3E-10	0.34%	0.25%	4.3E-10	0.34%	0.25%	7.8E-12	0.33%	0.05%	7.8E-12	0.33%	0.05%
	PU-238	6.0E-09	0.03%	0.03%	4.6E-10	0.37%	0.26%	4.6E-10	0.37%	0.26%	8.4E-12	0.35%	0.05%	8.4E-12	0.35%	0.05%
	PU-239/240	1.4E-09	0.01%	0.01%	1.1E-10	0.08%	0.06%	1.1E-10	0.08%	0.06%	1.9E-12	0.08%	0.01%	1.9E-12	0.08%	0.01%
	RA-226	5.2E-06	21.66%	21.66%	2.8E-10	0.22%	0.16%	2.8E-10	0.22%	0.16%	5.0E-12	0.21%	0.03%	5.0E-12	0.21%	0.03%
	RA-228	2.1E-06	8.88%	8.88%	2.3E-11	0.02%	0.01%	2.3E-11	0.02%	0.01%	4.2E-13	0.02%	0.00%	4.2E-13	0.02%	0.00%
	SR-90	9.2E-10	0.00%	0.00%	1.0E-12	0.00%	0.00%	1.0E-12	0.00%	0.00%	1.8E-14	0.00%	0.00%	1.8E-14	0.00%	0.00%
	TH-228	7.3E-06	30.44%	30.44%	4.7E-09	3.72%	2.67%	4.7E-09	3.72%	2.67%	8.4E-11	3.57%	0.53%	8.4E-11	3.57%	0.53%
	TH-230	1.3E-07	0.54%	0.54%	2.7E-08	21.31%	15.26%	2.7E-08	21.31%	15.26%	4.8E-10	20.41%	3.02%	4.8E-10	20.41%	3.02%
	TH-232	5.0E-06	20.81%	20.81%	2.9E-09	2.35%	1.69%	2.9E-09	2.35%	1.69%	5.3E-11	2.26%	0.33%	5.3E-11	2.26%	0.33%
	U-234	5.7E-08	0.24%	0.24%	1.1E-08	8.96%	6.42%	1.1E-08	8.96%	6.42%	2.0E-10	8.58%	1.27%	2.0E-10	8.58%	1.27%
	U-235/236	1.9E-07	0.80%	0.80%	9.0E-10	0.72%	0.51%	9.0E-10	0.72%	0.51%	1.6E-11	0.69%	0.10%	1.6E-11	0.69%	0.10%
	U-238	1.5E-06	6.37%	6.37%	7.6E-08	60.71%	43.49%	7.6E-08	60.71%	43.49%	1.4E-09	58.15%	8.59%	1.4E-09	58.15%	8.59%
	Total Radiological Risk	2.2E-05	92.99%	92.99%	1.2E-07	98.80%	70.78%	1.2E-07	98.80%	70.78%	2.2E-09	94.64%	13.99%	2.2E-09	94.64%	13.99%
	Aroclor-1254	3.4E-07	1.43%	1.43%												
	Arsenic	4.3E-07	1.79%	1.79%	1.2E-09	0.99%	0.71%	1.2E-09	0.99%	0.71%	1.0E-10	4.41%	0.65%	1.0E-10	4.41%	0.65%
	Benzo(a)pyrene	3.9E-07	1.60%	1.60%	7.7E-11	0.06%	0.04%	7.7E-11	0.06%	0.04%	6.5E-12	0.28%	0.04%	6.5E-12	0.28%	0.04%
	Benzo(a)anthracene	3.2E-08	0.13%	0.13%	6.4E-12	0.01%	0.00%	6.4E-12	0.01%	0.00%	5.4E-13	0.02%	0.00%	5.4E-13	0.02%	0.00%
	Benzo(b)fluoranthene	3.5E-08	0.15%	0.15%	7.0E-12	0.01%	0.00%	7.0E-12	0.01%	0.00%	5.9E-13	0.03%	0.00%	5.9E-13	0.03%	0.00%
	bis(2-Ethylhexyl)phthalate	8.5E-09	0.04%	0.04%												
	Beryllium	3.1E-07	1.31%	1.31%	1.5E-10	0.12%	0.08%	1.5E-10	0.12%	0.08%	1.2E-11	0.52%	0.08%	1.2E-11	0.52%	0.08%
	Dibenzo(a,h)anthracene	1.1E-07	0.47%	0.47%	2.2E-11	0.02%	0.01%	2.2E-11	0.02%	0.01%	1.9E-12	0.08%	0.01%	1.9E-12	0.08%	0.01%
	Indeno(1,2,3-cd)pyrene	2.5E-08	0.10%	0.10%	5.1E-12	0.00%	0.00%	5.1E-12	0.00%	0.00%	4.3E-13	0.02%	0.00%	4.3E-13	0.02%	0.00%
	Total Chemical Risk	1.7E-06	7.01%	7.01%	1.5E-09	1.20%	0.86%	1.5E-09	1.20%	0.86%	1.3E-10	5.36%	0.79%	1.3E-10	5.36%	0.79%
	Total	2.4E-05	100.00%	100.00%	1.3E-07	100.00%	71.63%	1.3E-07	100.00%	71.63%	2.4E-09	100.00%	14.78%	2.4E-09	100.00%	14.78%
Groundwater	TC-99	N/A			1.1E-08	100.00%	6.20%	1.1E-08	100.00%	6.20%	4.6E-10	100.00%	2.90%	4.6E-10	100.00%	2.90%
	Total Radiological Risk				1.1E-08	100.00%	6.20%	1.1E-08	100.00%	6.20%	4.6E-10	100.00%	2.90%	4.6E-10	100.00%	2.90%

000404

6502

TABLE B.3.5-27
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User (Adult)	% Total Medium Risk	% Total Receptor Risk
Soil/Air	CS-137	2.3E-11	0.00%	0.00%	1.7E-12	0.00%	0.00%	4.2E-13	0.00%	0.00%	2.3E-11	0.00%	0.00%
	NP-237	3.6E-08	0.34%	0.27%	2.7E-09	0.34%	0.29%	6.6E-10	0.33%	0.06%	3.6E-08	0.34%	0.27%
	PU-238	3.9E-08	0.37%	0.29%	2.9E-09	0.37%	0.31%	7.1E-10	0.35%	0.06%	3.9E-08	0.37%	0.29%
	PU-239/240	8.9E-09	0.08%	0.07%	6.6E-10	0.08%	0.07%	1.6E-10	0.08%	0.01%	8.9E-09	0.08%	0.07%
	RA-226	2.3E-08	0.22%	0.18%	1.7E-09	0.22%	0.18%	4.2E-10	0.21%	0.04%	2.3E-08	0.22%	0.18%
	RA-228	2.0E-09	0.02%	0.01%	1.5E-10	0.02%	0.02%	3.6E-11	0.02%	0.00%	2.0E-09	0.02%	0.01%
	SR-90	8.5E-11	0.00%	0.00%	6.3E-12	0.00%	0.00%	1.5E-12	0.00%	0.00%	8.5E-11	0.00%	0.00%
	TH-228	4.0E-07	3.72%	2.96%	2.9E-08	3.72%	3.12%	7.2E-09	3.57%	0.61%	4.0E-07	3.72%	2.96%
	TH-230	2.3E-06	21.28%	16.94%	1.7E-07	21.28%	17.86%	4.1E-08	20.38%	3.48%	2.3E-06	21.28%	16.94%
	TH-232	2.5E-07	2.35%	1.87%	1.8E-08	2.35%	1.98%	4.5E-09	2.25%	0.39%	2.5E-07	2.35%	1.87%
	U-234	9.5E-07	8.94%	7.12%	7.0E-08	8.94%	7.51%	1.7E-08	8.57%	1.46%	9.5E-07	8.94%	7.12%
	U-235/236	7.6E-08	0.71%	0.57%	5.6E-09	0.71%	0.60%	1.4E-09	0.68%	0.12%	7.6E-08	0.71%	0.57%
	U-238	6.4E-06	60.76%	48.38%	4.8E-07	60.76%	51.00%	1.2E-07	58.19%	9.95%	6.4E-06	60.76%	48.38%
	Total Radiological Risk	1.0E-05	98.80%	78.67%	7.7E-07	98.80%	82.94%	1.9E-07	94.64%	16.18%	1.0E-05	98.80%	78.67%
	Aroclor-1254												
	Arsenic	1.0E-07	0.99%	0.79%	7.8E-09	0.99%	0.83%	8.9E-09	4.42%	0.76%	1.0E-07	0.99%	0.79%
	Benzo(a)pyrene	6.5E-09	0.06%	0.05%	4.8E-10	0.06%	0.05%	5.5E-10	0.27%	0.05%	6.5E-09	0.06%	0.05%
	Benzo(a)anthracene	5.4E-10	0.01%	0.00%	4.0E-11	0.01%	0.00%	4.6E-11	0.02%	0.00%	5.4E-10	0.01%	0.00%
	Benzo(b)fluoranthene	5.9E-10	0.01%	0.00%	4.4E-11	0.01%	0.00%	5.0E-11	0.02%	0.00%	5.9E-10	0.01%	0.00%
	bis(2-Ethylhexyl)phthalate												
	Beryllium	1.2E-08	0.12%	0.09%	9.2E-10	0.12%	0.10%	1.0E-09	0.52%	0.09%	1.2E-08	0.12%	0.09%
	Dibenzo(a,h)anthracene	1.9E-09	0.02%	0.01%	1.4E-10	0.02%	0.02%	1.6E-10	0.08%	0.01%	1.9E-09	0.02%	0.01%
	Indeno(1,2,3-cd)pyrene	4.3E-10	0.00%	0.00%	3.2E-11	0.00%	0.00%	3.6E-11	0.02%	0.00%	4.3E-10	0.00%	0.00%
	Total Chemical Risk	1.3E-07	1.20%	0.96%	9.4E-09	1.20%	1.01%	1.1E-08	5.36%	0.92%	1.3E-07	1.20%	0.96%
	Total	1.1E-05	100.00%	79.62%	7.8E-07	100.00%	83.95%	2.0E-07	100.00%	17.10%	1.1E-05	100.00%	79.62%
Groundwater	TC-99	1.9E-07	100.00%	1.41%	1.1E-08	100.00%	1.21%	8.1E-09	100.00%	0.69%	N/A		
	Total Radiological Risk	1.9E-07	100.00%	1.41%	1.1E-08	100.00%	1.21%	8.1E-09	100.00%	0.69%	N/A		

TABLE B.3.5-27
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk
Perched Groundwater	NP-237	N/A			N/A			N/A			N/A			N/A		
	SR-90	N/A			N/A			N/A			N/A			N/A		
	TC-99	N/A			N/A			N/A			N/A			N/A		
	Total Radiological Risk															
	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Total Chemical Risk															
	Total															
Homegrown Produce (Fruits and Vegetables, Dust Affected)	CS-137	N/A			7.2E-12	0.11%	0.00%	7.2E-12	0.11%	0.00%	5.1E-13	0.03%	0.00%	5.1E-13	0.03%	0.00%
	NP-237	N/A			4.2E-11	0.61%	0.02%	4.2E-11	0.61%	0.02%	3.0E-12	0.16%	0.02%	3.0E-12	0.16%	0.02%
	PU-238	N/A			3.3E-11	0.48%	0.02%	3.3E-11	0.48%	0.02%	2.3E-12	0.12%	0.01%	2.3E-12	0.12%	0.01%
	PU-239/240	N/A			8.1E-12	0.12%	0.00%	8.1E-12	0.12%	0.00%	5.7E-13	0.03%	0.00%	5.7E-13	0.03%	0.00%
	RA-226	N/A			4.0E-10	5.90%	0.23%	4.0E-10	5.90%	0.23%	2.8E-11	1.51%	0.18%	2.8E-11	1.51%	0.18%
	RA-228	N/A			4.3E-11	0.63%	0.02%	4.3E-11	0.63%	0.02%	3.0E-12	0.16%	0.02%	3.0E-12	0.16%	0.02%
	SR-90	N/A			8.3E-12	0.12%	0.00%	8.3E-12	0.12%	0.00%	5.8E-13	0.03%	0.00%	5.8E-13	0.03%	0.00%
	TH-228	N/A			4.1E-11	0.61%	0.02%	4.1E-11	0.61%	0.02%	2.9E-12	0.15%	0.02%	2.9E-12	0.15%	0.02%
	TH-230	N/A			1.6E-10	2.27%	0.09%	1.6E-10	2.27%	0.09%	1.1E-11	0.58%	0.07%	1.1E-11	0.58%	0.07%
	TH-232	N/A			5.9E-11	0.87%	0.03%	5.9E-11	0.87%	0.03%	4.2E-12	0.22%	0.03%	4.2E-12	0.22%	0.03%
	U-234	N/A			8.8E-11	1.29%	0.05%	8.8E-11	1.29%	0.05%	6.2E-12	0.33%	0.04%	6.2E-12	0.33%	0.04%
	U-235/236	N/A			7.3E-12	0.11%	0.00%	7.3E-12	0.11%	0.00%	5.1E-13	0.03%	0.00%	5.1E-13	0.03%	0.00%
	U-238	N/A			5.2E-10	7.63%	0.30%	5.2E-10	7.63%	0.30%	3.7E-11	1.95%	0.23%	3.7E-11	1.95%	0.23%
	Total Radiological Risk				1.4E-09	20.74%	0.81%	1.4E-09	20.74%	0.81%	1.0E-10	5.31%	0.62%	1.0E-10	5.31%	0.62%
	Aroclor-1254	N/A			2.5E-10	3.67%	0.14%	2.5E-10	3.67%	0.14%	8.2E-11	4.38%	0.51%	8.2E-11	4.38%	0.51%
	Arsenic	N/A			2.3E-09	33.06%	1.29%	2.3E-09	33.06%	1.29%	7.4E-10	39.52%	4.64%	7.4E-10	39.52%	4.64%
	Benzo(a)pyrene	N/A			1.2E-09	17.88%	0.70%	1.2E-09	17.88%	0.70%	4.0E-10	21.34%	2.51%	4.0E-10	21.34%	2.51%
	Benzo(a)anthracene	N/A			1.0E-10	1.52%	0.06%	1.0E-10	1.52%	0.06%	3.4E-11	1.82%	0.21%	3.4E-11	1.82%	0.21%
	Benzo(b)fluoranthene	N/A			1.1E-10	1.61%	0.06%	1.1E-10	1.61%	0.06%	3.6E-11	1.92%	0.23%	3.6E-11	1.92%	0.23%
	bis(2-Ethylhexyl)phthalate	N/A			2.0E-11	0.30%	0.01%	2.0E-11	0.30%	0.01%	6.7E-12	0.36%	0.04%	6.7E-12	0.36%	0.04%
	Beryllium	N/A			1.0E-09	14.98%	0.59%	1.0E-09	14.98%	0.59%	3.4E-10	17.90%	2.10%	3.4E-10	17.90%	2.10%
	Dibenzo(a,h)anthracene	N/A			3.5E-10	5.09%	0.20%	3.5E-10	5.09%	0.20%	1.1E-10	6.08%	0.71%	1.1E-10	6.08%	0.71%
	Indeno(1,2,3-cd)pyrene	N/A			7.9E-11	1.15%	0.05%	7.9E-11	1.15%	0.05%	2.6E-11	1.37%	0.16%	2.6E-11	1.37%	0.16%
	Total Chemical Risk				5.4E-09	79.26%	3.10%	5.4E-09	79.26%	3.10%	1.8E-09	94.69%	11.12%	1.8E-09	94.69%	11.12%
	Total				6.8E-09	100.00%	3.91%	6.8E-09	100.00%	3.91%	1.9E-09	100.00%	11.74%	1.9E-09	100.00%	11.74%

000106

6502

TABLE B.3.5-27
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User	% Total Medium Risk	% Total Receptor Risk
Perched Groundwater	NP-237	N/A			N/A			N/A			5.5E-05	85.42%	70.84%
	SR-90	N/A			N/A			N/A			3.4E-06	5.28%	4.38%
	TC-99	N/A			N/A			N/A			5.2E-06	8.21%	6.81%
	Total Radiological Risk										6.3E-05	98.91%	82.03%
	Arsenic	N/A			N/A			N/A			7.0E-07	1.09%	0.91%
	Total Chemical Risk										7.0E-07	1.09%	0.91%
	Total										6.4E-05	100.00%	82.93%
Homegrown Produce (Fruits and Vegetables, Dust Affected)	CS-137	6.1E-10	0.10%	0.00%	3.4E-11	0.10%	0.00%	4.3E-11	0.03%	0.00%	6.1E-10	0.10%	0.00%
	NP-237	3.9E-09	0.66%	0.03%	2.1E-10	0.66%	0.02%	2.7E-10	0.17%	0.02%	3.9E-09	0.66%	0.03%
	PU-238	2.8E-09	0.48%	0.02%	1.5E-10	0.48%	0.02%	2.0E-10	0.12%	0.02%	2.8E-09	0.48%	0.02%
	PU-239/240	6.9E-10	0.12%	0.01%	3.8E-11	0.12%	0.00%	4.9E-11	0.03%	0.00%	6.9E-10	0.12%	0.01%
	RA-226	3.8E-08	6.55%	0.29%	2.1E-09	6.55%	0.23%	2.7E-09	1.69%	0.23%	3.8E-08	6.55%	0.29%
	RA-228	3.6E-09	0.62%	0.03%	2.0E-10	0.62%	0.02%	2.6E-10	0.16%	0.02%	3.6E-09	0.62%	0.03%
	SR-90	8.9E-10	0.15%	0.01%	4.9E-11	0.15%	0.01%	6.3E-11	0.04%	0.01%	8.9E-10	0.15%	0.01%
	TH-228	3.5E-09	0.60%	0.03%	1.9E-10	0.60%	0.02%	2.5E-10	0.15%	0.02%	3.5E-09	0.60%	0.03%
	TH-230	1.3E-08	2.24%	0.10%	7.3E-10	2.24%	0.08%	9.3E-10	0.58%	0.08%	1.3E-08	2.24%	0.10%
	TH-232	5.0E-09	0.85%	0.04%	2.8E-10	0.85%	0.03%	3.5E-10	0.22%	0.03%	5.0E-09	0.85%	0.04%
	U-234	7.9E-09	1.34%	0.06%	4.3E-10	1.34%	0.05%	5.5E-10	0.35%	0.05%	7.9E-09	1.34%	0.06%
	U-235/236	6.5E-10	0.11%	0.00%	3.6E-11	0.11%	0.00%	4.6E-11	0.03%	0.00%	6.5E-10	0.11%	0.00%
	U-238	4.7E-08	7.95%	0.35%	2.6E-09	7.95%	0.27%	3.3E-09	2.06%	0.28%	4.7E-08	7.95%	0.35%
	Total Radiological Risk	1.3E-07	21.76%	0.96%	7.0E-09	21.76%	0.75%	9.0E-09	5.63%	0.77%	1.3E-07	21.76%	0.96%
	Aroclor-1254	5.6E-09	0.96%	0.04%	3.1E-10	0.96%	0.03%	1.8E-09	1.15%	0.16%	5.6E-09	0.96%	0.04%
	Arsenic	1.9E-07	32.64%	1.44%	1.1E-08	32.65%	1.13%	6.3E-08	39.40%	5.38%	1.9E-07	32.64%	1.44%
	Benzo(a)pyrene	1.0E-07	17.57%	0.78%	5.7E-09	17.57%	0.61%	3.4E-08	21.17%	2.89%	1.0E-07	17.57%	0.78%
	Benzo(a)anthracene	8.9E-09	1.51%	0.07%	4.9E-10	1.51%	0.05%	2.9E-09	1.82%	0.25%	8.9E-09	1.51%	0.07%
	Benzo(b)fluoranthene	9.3E-09	1.58%	0.07%	5.1E-10	1.58%	0.05%	3.1E-09	1.91%	0.26%	9.3E-09	1.58%	0.07%
	bis(2-Ethylhexyl)phthalat	1.7E-09	0.29%	0.01%	9.5E-11	0.29%	0.01%	5.7E-10	0.36%	0.05%	1.7E-09	0.29%	0.01%
	Beryllium	1.0E-07	17.54%	0.77%	5.7E-09	17.54%	0.61%	3.4E-08	21.17%	2.89%	1.0E-07	17.54%	0.77%
	Dibenzo(a,h)anthracene	2.9E-08	5.01%	0.22%	1.6E-09	5.01%	0.17%	9.7E-09	6.04%	0.82%	2.9E-08	5.01%	0.22%
	Indeno(1,2,3-cd)pyrene	6.6E-09	1.13%	0.05%	3.6E-10	1.13%	0.04%	2.2E-09	1.36%	0.19%	6.6E-09	1.13%	0.05%
	Total Chemical Risk	4.6E-07	78.24%	3.45%	2.5E-08	78.24%	2.71%	1.5E-07	94.37%	12.88%	4.6E-07	78.24%	3.45%
	Total	5.9E-07	100.00%	4.41%	3.2E-08	100.00%	3.46%	1.6E-07	100.00%	13.65%	5.9E-07	100.00%	4.41%

TABLE B.3.5-27
(continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Child (Fed. Own.)	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Groundwater Affected)	TC-99	N/A			3.5E-09	100.00%	1.99%	3.5E-09	100.00%	1.99%	2.5E-10	100.00%	1.53%	2.5E-10	100.00%	1.53%
	Total Radiological Risk				3.5E-09	100.00%	1.99%	3.5E-09	100.00%	1.99%	2.5E-10	100.00%	1.53%	2.5E-10	100.00%	1.53%
Beef/Milk (Dust Affected)	CS-137	N/A			3.5E-11	0.20%	0.02%	3.5E-11	0.20%	0.02%	4.4E-12	0.05%	0.03%	4.4E-12	0.05%	0.03%
	NP-237	N/A			1.9E-13	0.00%	0.00%	1.9E-13	0.00%	0.00%	1.5E-14	0.00%	0.00%	1.5E-14	0.00%	0.00%
	PU-238	N/A			1.9E-15	0.00%	0.00%	1.9E-15	0.00%	0.00%	2.0E-16	0.00%	0.00%	2.0E-16	0.00%	0.00%
	PU-239/240	N/A			4.9E-16	0.00%	0.00%	4.9E-16	0.00%	0.00%	5.2E-17	0.00%	0.00%	5.2E-17	0.00%	0.00%
	RA-226	N/A			7.1E-11	0.41%	0.04%	7.1E-11	0.41%	0.04%	1.2E-11	0.13%	0.08%	1.2E-11	0.13%	0.08%
	RA-228	N/A			5.0E-12	0.03%	0.00%	5.0E-12	0.03%	0.00%	8.7E-13	0.01%	0.01%	8.7E-13	0.01%	0.01%
	SR-90	N/A			6.5E-12	0.04%	0.00%	6.5E-12	0.04%	0.00%	1.2E-12	0.01%	0.01%	1.2E-12	0.01%	0.01%
	TH-228	N/A			5.6E-14	0.00%	0.00%	5.6E-14	0.00%	0.00%	8.8E-15	0.00%	0.00%	8.8E-15	0.00%	0.00%
	TH-230	N/A			9.9E-13	0.01%	0.00%	9.9E-13	0.01%	0.00%	1.6E-13	0.00%	0.00%	1.6E-13	0.00%	0.00%
	TH-232	N/A			3.8E-13	0.00%	0.00%	3.8E-13	0.00%	0.00%	5.9E-14	0.00%	0.00%	5.9E-14	0.00%	0.00%
	U-234	N/A			1.2E-11	0.07%	0.01%	1.2E-11	0.07%	0.01%	2.2E-12	0.02%	0.01%	2.2E-12	0.02%	0.01%
	U-235/236	N/A			1.0E-12	0.01%	0.00%	1.0E-12	0.01%	0.00%	1.9E-13	0.00%	0.00%	1.9E-13	0.00%	0.00%
	U-238	N/A			7.3E-11	0.42%	0.04%	7.3E-11	0.42%	0.04%	1.3E-11	0.14%	0.08%	1.3E-11	0.14%	0.08%
	Total Radiological Risk				2.1E-10	1.18%	0.12%	2.1E-10	1.18%	0.12%	3.5E-11	0.36%	0.22%	3.5E-11	0.36%	0.22%
	Aroclor-1254	N/A			1.6E-09	9.42%	0.94%	1.6E-09	9.42%	0.94%	9.5E-10	9.81%	5.90%	9.5E-10	9.81%	5.90%
	Arsenic	N/A			7.8E-10	4.49%	0.45%	7.8E-10	4.49%	0.45%	1.8E-10	1.92%	1.15%	1.8E-10	1.92%	1.15%
	Benzo(a)pyrene	N/A			4.9E-09	28.17%	2.82%	4.9E-09	28.17%	2.82%	2.8E-09	29.33%	17.65%	2.8E-09	29.33%	17.65%
	Benzo(a)anthracene	N/A			1.5E-10	0.88%	0.09%	1.5E-10	0.88%	0.09%	8.8E-11	0.91%	0.55%	8.8E-11	0.91%	0.55%
	Benzo(b)fluoranthene	N/A			4.6E-10	2.63%	0.26%	4.6E-10	2.63%	0.26%	2.6E-10	2.74%	1.65%	2.6E-10	2.74%	1.65%
	bis(2-Ethylhexyl)phthalate	N/A			4.3E-10	2.48%	0.25%	4.3E-10	2.48%	0.25%	2.5E-10	2.58%	1.55%	2.5E-10	2.58%	1.55%
	Beryllium	N/A			1.2E-10	0.67%	0.07%	1.2E-10	0.67%	0.07%	1.8E-11	0.19%	0.11%	1.8E-11	0.19%	0.11%
	Dibenzo(a,h)anthracene	N/A			7.8E-09	44.63%	4.46%	7.8E-09	44.63%	4.46%	4.5E-09	46.48%	27.96%	4.5E-09	46.48%	27.96%
	Indeno(1,2,3-cd)pyrene	N/A			9.5E-10	5.45%	0.54%	9.5E-10	5.45%	0.54%	5.5E-10	5.68%	3.41%	5.5E-10	5.68%	3.41%
	Total Chemical Risk				1.7E-08	98.82%	9.88%	1.7E-08	98.82%	9.88%	9.6E-09	99.64%	59.94%	9.6E-09	99.64%	59.94%
	Total				1.7E-08	100.00%	9.99%	1.7E-08	100.00%	9.99%	9.6E-09	100.00%	60.15%	9.6E-09	100.00%	60.15%
Beef/Milk (Groundwater Affected)	TC-99	N/A			8.3E-09	100.00%	4.73%	8.3E-09	100.00%	4.73%	1.4E-09	100.00%	8.59%	1.4E-09	100.00%	8.59%
	Total Radiological Risk				8.3E-09	100.00%	4.73%	8.3E-09	100.00%	4.73%	1.4E-09	100.00%	8.59%	1.4E-09	100.00%	8.59%
Ambient Radon		9.8E-09		0.04%	2.7E-09		1.54%	2.7E-09		1.54%	4.9E-11		0.30%	4.9E-11		0.30%
ALL MEDIA		**2.4E-05**			**1.7E-07**			**1.7E-07**			**1.6E-08**			**1.6E-08**		

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TABLE B.3.5-27
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk	Perched Groundwater User	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Groundwater Affected)	TC-99	6.1E-08	100.00%	0.45%	3.3E-09	100.00%	0.36%	4.3E-09	100.00%	0.36%	6.1E-08	100.00%	0.08%
	Total Radiological Risk	6.1E-08	100.00%	0.45%	3.3E-09	100.00%	0.36%	4.3E-09	100.00%	0.36%	6.1E-08	100.00%	0.08%
Beef/Milk (Dust Affected)	CS-137	2.9E-09	0.21%	0.02%	1.5E-10	0.21%	0.02%	3.8E-10	0.05%	0.03%	2.9E-09	0.21%	0.00%
	NP-237	3.6E-11	0.00%	0.00%	1.9E-12	0.00%	0.00%	2.7E-12	0.00%	0.00%	3.6E-11	0.00%	0.00%
	PU-238	2.0E-13	0.00%	0.00%	1.1E-14	0.00%	0.00%	2.1E-14	0.00%	0.00%	2.0E-13	0.00%	0.00%
	PU-239/240	1.3E-13	0.00%	0.00%	6.7E-15	0.00%	0.00%	1.3E-14	0.00%	0.00%	1.3E-13	0.00%	0.00%
	RA-226	1.7E-08	1.20%	0.13%	7.8E-10	1.10%	0.08%	2.9E-09	0.39%	0.25%	1.7E-08	1.20%	0.02%
	RA-228	4.3E-10	0.03%	0.00%	2.0E-11	0.03%	0.00%	7.4E-11	0.01%	0.01%	4.3E-10	0.03%	0.00%
	SR-90	1.4E-09	0.10%	0.01%	6.5E-11	0.09%	0.01%	2.6E-10	0.04%	0.02%	1.4E-09	0.10%	0.00%
	TH-228	4.8E-12	0.00%	0.00%	2.3E-13	0.00%	0.00%	7.5E-13	0.00%	0.00%	4.8E-12	0.00%	0.00%
	TH-230	9.2E-11	0.01%	0.00%	4.4E-12	0.01%	0.00%	1.4E-11	0.00%	0.00%	9.2E-11	0.01%	0.00%
	TH-232	3.2E-11	0.00%	0.00%	1.5E-12	0.00%	0.00%	5.0E-12	0.00%	0.00%	3.2E-11	0.00%	0.00%
	U-234	1.4E-09	0.10%	0.01%	6.5E-11	0.09%	0.01%	2.5E-10	0.03%	0.02%	1.4E-09	0.10%	0.00%
	U-235/236	1.2E-10	0.01%	0.00%	5.4E-12	0.01%	0.00%	2.1E-11	0.00%	0.00%	1.2E-10	0.01%	0.00%
	U-238	8.3E-09	0.60%	0.06%	3.8E-10	0.54%	0.04%	1.5E-09	0.20%	0.13%	8.3E-09	0.60%	0.01%
	Total Radiological Risk	3.1E-08	2.27%	0.24%	1.5E-09	2.09%	0.16%	5.4E-09	0.72%	0.46%	3.1E-08	2.27%	0.04%
	Aroclor-1254	1.8E-08	1.32%	0.14%	9.2E-10	1.31%	0.10%	1.1E-08	1.40%	0.89%	1.8E-08	1.32%	0.02%
	Arsenic	6.7E-08	4.81%	0.50%	3.7E-09	5.30%	0.40%	1.6E-08	2.09%	1.34%	6.7E-08	4.81%	0.09%
	Benzo(a)pyrene	4.2E-07	30.01%	3.12%	2.1E-08	29.83%	2.25%	2.4E-07	31.85%	20.37%	4.2E-07	30.01%	0.54%
	Benzo(a)anthracene	1.3E-08	0.94%	0.10%	6.6E-10	0.94%	0.07%	7.5E-09	1.00%	0.64%	1.3E-08	0.94%	0.02%
	Benzo(b)fluoranthene	3.9E-08	2.80%	0.29%	2.0E-09	2.78%	0.21%	2.2E-08	2.97%	1.90%	3.9E-08	2.80%	0.05%
	bis(2-Ethylhexyl)phthalat	3.7E-08	2.64%	0.28%	1.9E-09	2.63%	0.20%	2.1E-08	2.80%	1.79%	3.7E-08	2.64%	0.05%
	Beryllium	2.6E-08	1.84%	0.19%	1.5E-09	2.08%	0.16%	4.0E-09	0.54%	0.34%	2.6E-08	1.84%	0.03%
	Dibenzo(a,h)anthracene	6.6E-07	47.58%	4.95%	3.3E-08	47.29%	3.57%	3.8E-07	50.49%	32.30%	6.6E-07	47.58%	0.86%
	Indeno(1,2,3-cd)pyrene	8.0E-08	5.79%	0.60%	4.1E-09	5.75%	0.43%	4.6E-08	6.14%	3.93%	8.0E-08	5.79%	0.10%
	Total Chemical Risk	1.4E-06	97.73%	10.17%	6.9E-08	97.91%	7.39%	7.5E-07	99.28%	63.51%	1.4E-06	97.73%	1.76%
	Total	1.4E-06	100.00%	10.41%	7.0E-08	100.00%	7.54%	7.5E-07	100.00%	63.97%	1.4E-06	100.00%	3.52%
Beef/Milk (Groundwater Affected)	TC-99	1.4E-07	100.00%	1.08%	6.8E-09	100.00%	0.73%	2.4E-08	100.00%	2.04%	1.4E-07	100.00%	0.19%
	Total Radiological Risk	1.4E-07	100.00%	1.08%	6.8E-09	100.00%	0.73%	2.4E-08	100.00%	2.04%	1.4E-07	100.00%	0.19%
Ambient Radon		3.5E-07		2.61%	2.6E-08		2.75%	2.6E-08		2.19%	3.5E-07		2.61%
ALL MEDIA		**1.3E-05**			**9.3E-07**			**1.2E-06**			**7.7E-05**		

N/A signifies that exposure of the receptor to the indicated medium is not applicable.

TABLE B.3.5-28
FUTURE LAND USE
LIME SLUDGE PONDS
SUMMARY OF NON-CARCINOGENIC HAZARDS

Medium	Parameter	Expanded Trespasser	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Hazard	% Total Receptor Hazard	Off-Propert Res. Farmer (Fed. Own.)	% Total Medium Hazard	% Total Receptor Hazard	Off-Property Res. Child (Priv. Own.)	% Total Medium Hazard	% Total Receptor Hazard	Off-Propert Res. Child (Fed. Own.)	% Total Medium Hazard	% Total Receptor Hazard
Soil/Air	Arsenic	1.3E-03	0.59%	0.59%	N/D			N/D			N/D			N/D		
	bis(2-Ethylhexyl)phthalate	4.8E-05	0.02%	0.02%	N/D			N/D			N/D			N/D		
	Beryllium	4.4E-03	2.05%	2.05%	N/D			N/D			N/D			N/D		
	U-TOTAL	2.1E-01	97.34%	97.34%	N/D			N/D			N/D			N/D		
	Total	2.2E-01	100.00%	100.00%												
Perched Groundwater	Arsenic	N/A			N/A			N/A			N/A			N/A		
	Total															
Homegrown Produce (Dust Affected)	Arsenic	N/A			4.3E-06	27.79%	20.99%	4.3E-06	27.79%	20.99%	1.7E-05	27.79%	17.68%	1.7E-05	27.79%	17.68%
	bis(2-Ethylhexyl)phthalate	N/A			7.3E-08	0.47%	0.36%	7.3E-08	0.47%	0.36%	2.8E-07	0.47%	0.30%	2.8E-07	0.47%	0.30%
	Beryllium	N/A			4.8E-08	0.31%	0.23%	4.8E-08	0.31%	0.23%	1.8E-07	0.31%	0.20%	1.8E-07	0.31%	0.20%
	U-TOTAL	N/A			1.1E-05	71.43%	53.94%	1.1E-05	71.43%	53.94%	4.2E-05	71.43%	45.43%	4.2E-05	71.43%	45.43%
	Total				1.5E-05	100.00%	75.52%	1.5E-05	100.00%	75.52%	5.9E-05	100.00%	63.61%	5.9E-05	100.00%	63.61%
Beef/Milk (Dust Affected)	Arsenic	N/A			1.5E-06	29.80%	7.29%	1.5E-06	29.80%	7.29%	4.1E-06	12.07%	4.39%	4.1E-06	12.07%	4.39%
	bis(2-Ethylhexyl)phthalate	N/A			1.5E-06	30.81%	7.54%	1.5E-06	30.81%	7.54%	1.0E-05	30.49%	11.09%	1.0E-05	30.49%	11.09%
	Beryllium	N/A			5.4E-09	0.11%	0.03%	5.4E-09	0.11%	0.03%	1.0E-08	0.03%	0.01%	1.0E-08	0.03%	0.01%
	U-TOTAL	N/A			2.0E-06	39.28%	9.62%	2.0E-06	39.28%	9.62%	2.0E-05	57.41%	20.89%	2.0E-05	57.41%	20.89%
	Total				5.0E-06	100.00%	24.48%	5.0E-06	100.00%	24.48%	3.4E-05	100.00%	36.39%	3.4E-05	100.00%	36.39%
ALL MEDIA		**2.2E-01**			**2.0E-05**			**2.0E-05**			**9.3E-05**			**9.3E-05**		

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TABLE B.3.5-28
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% Total Medium Hazard	% Total Receptor Hazard	On-Property Resident Farmer (CT)	% Total Medium Hazard	% Total Receptor Hazard	On-Property Resident Child	% Total Medium Hazard	% Total Receptor Hazard	Perched Groundwater User (Adult)	% Total Medium Hazard	% Total Receptor Hazard
Soil/Air	Arsenic	N/D			N/D			N/D			N/D		
	bis(2-Ethylhexyl)phthalate	N/D			N/D			N/D			N/D		
	Beryllium	N/D			N/D			N/D			N/D		
	U-TOTAL	N/D			N/D			N/D			N/D		
	Total												
Perched Groundwater	Arsenic	N/A			N/A			N/A			1.3E-03	100.00%	43.35%
	Total										1.3E-03	100.00%	43.35%
Homegrown Produce (Dust Affected)	Arsenic	3.7E-04	27.91%	21.07%	1.6E-04	27.91%	21.50%	1.4E-03	27.91%	17.76%	3.7E-04	27.91%	21.07%
	bis(2-Ethylhexyl)phthalate	6.2E-06	0.47%	0.36%	2.6E-06	0.47%	0.36%	2.4E-05	0.47%	0.30%	6.2E-06	0.47%	0.36%
	Beryllium	4.8E-06	0.37%	0.28%	2.1E-06	0.37%	0.28%	1.8E-05	0.37%	0.23%	4.8E-06	0.37%	0.28%
	U-TOTAL	9.3E-04	71.25%	53.78%	4.0E-04	71.25%	54.89%	3.6E-03	71.25%	45.32%	9.3E-04	71.25%	53.78%
	Total	1.3E-03	100.00%	75.48%	5.6E-04	100.00%	77.04%	5.0E-03	100.00%	63.61%	1.3E-03	100.00%	75.48%
Beef/Milk (Dust Affected)	Arsenic	1.3E-04	29.85%	7.32%	5.5E-05	33.15%	7.61%	3.5E-04	12.12%	4.41%	1.3E-04	29.85%	7.32%
	bis(2-Ethylhexyl)phthalate	1.3E-04	30.77%	7.55%	5.1E-05	30.81%	7.08%	8.8E-04	30.52%	11.10%	1.3E-04	30.77%	7.55%
	Beryllium	1.2E-06	0.28%	0.07%	5.3E-07	0.32%	0.07%	2.2E-06	0.08%	0.03%	1.2E-06	0.28%	0.07%
	U-TOTAL	1.7E-04	39.10%	9.59%	6.0E-05	35.72%	8.20%	1.6E-03	57.29%	20.84%	1.7E-04	39.10%	9.59%
	Total	4.3E-04	100.00%	24.52%	1.7E-04	100.00%	22.96%	2.9E-03	100.00%	36.39%	4.3E-04	100.00%	24.52%
ALL MEDIA		**1.7E-03**			**7.3E-04**			**7.9E-03**			**3.1E-03**		

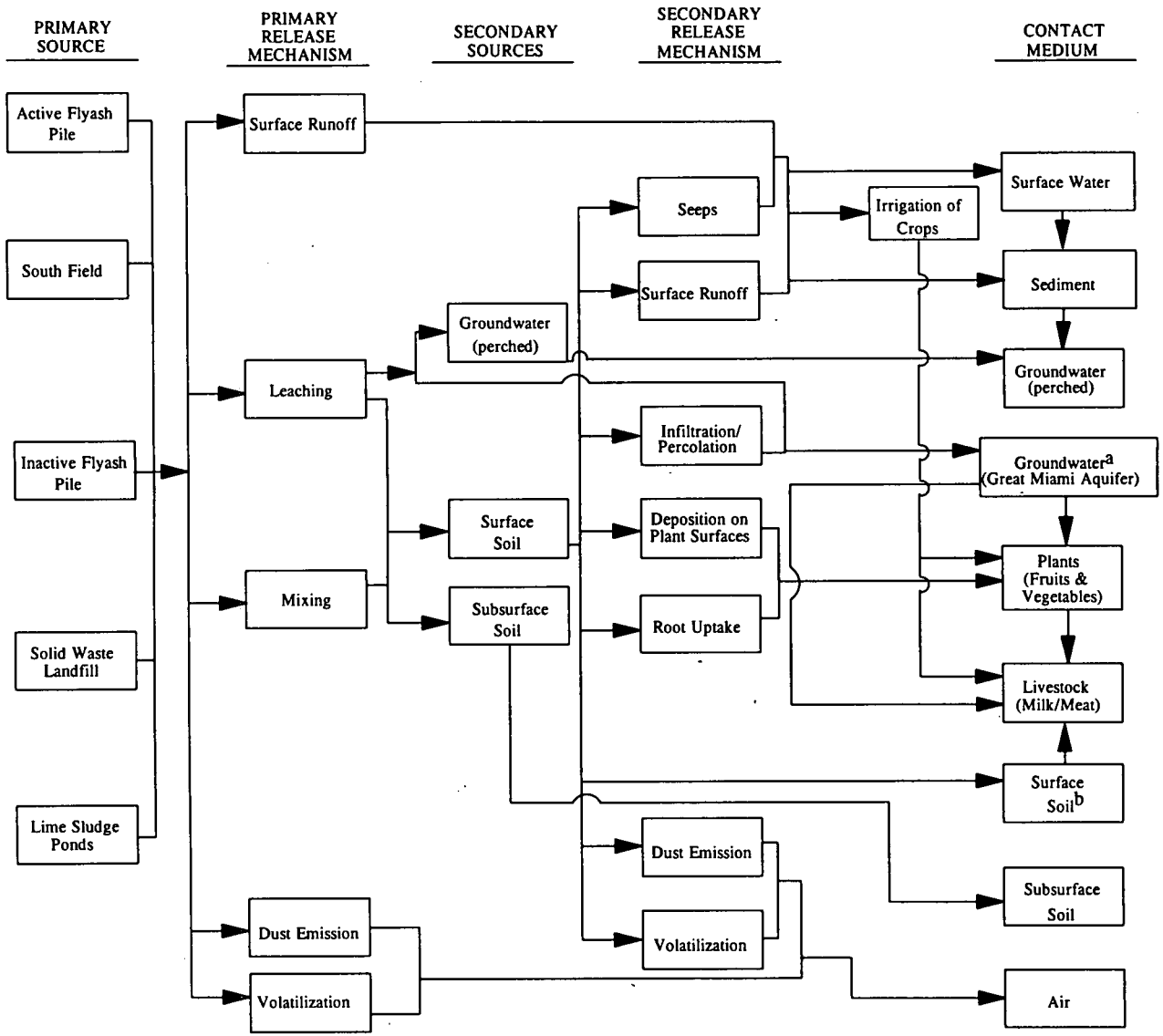
N/A signifies that exposure of the receptor to the indicated medium is not applicable.
N/D - not determined because toxicity data are not available.

- groundwater impacted simultaneously by the Active Flyash Pile, Inactive Flyash Pile and South Field -- the Lime Sludge Ponds and Solid Waste Landfill were not found to significantly impact groundwater;
- air impacted by all fine subunits;
- surface soil currently existing on the South Field; and,
- surface water and sediment impacted by all fine subunits in the Great Miami River

For the purpose of this assessment, the future on-property receptors were assumed to be located on the South Field; and the off-property receptors were assumed to be located at the point of greatest groundwater and air concentrations. Figure B.3-1 presents the conceptual model for the Operable Unit 2-wide scenario.

Estimated risk and hazards to the future off-property farmer due to contaminants present in surface soil (South Field), beef and milk, homegrown produce, and groundwater and summarized in Table B.3.6-1, B.3.6-2, B.3.6-3 and B.3.6-4, respectively (Attachment B.III). Generally, risks are on the order of 1.0×10^{-5} risk range due primarily to the ingestion of groundwater containing uranium-234, uranium-235/236, and uranium-238. For consumption of beef and milk, the risks were generally in the 1.4×10^{-5} range due primarily to ingestion of radium-226, benzo(a)pyrene, and dibenzo(a,h)anthracene. For homegrown produce, the risks were in the 1.8×10^{-6} range due primarily to the cumulative effect of all CPCs. Risks in groundwater were in the 6.0×10^{-5} range due primarily to the presence of uranium-235/236 and uranium-238 via ingestion. Consumption of total risk to this receptor was 2.4×10^{-4}. Total HI was 3.7 due primarily to the ingestion of homegrown produce irrigated with groundwater containing uranium-234, uranium-235/236, and uranium-238.

Estimated risks and hazards to the future on-property farmer due to contaminants present in surface soil (South Field), beef and milk, homegrown produce, and groundwater are summarized in Tables B.3.6-5, B.3.6-6, B.3.6-7 and B.3.6-8 respectively (Attachment B.III). The total receptor risk calculated for this receptor from all routes of exposure was 3.3×10^{-2}. Total risk from surface soil was 1.1×10^{-2} due primarily to external radiation from surface soil containing radium-226 (7.8×10^{-3}), radium-228 (4.7×10^{-4}), thorium-228 (1.0×10^{-3}), and thorium-232 (1.4×10^{-3}), and dermal contact with benzo(a)pyrene (3.4×10^{-4}). Additional CPCs contributed greater than 1.0×10^{-6} risk, however, their contribution was less than one percent of the medium risk. Another major contributor



RECEPTORS

Exposure Route	FUTURE LAND USE: FEDERAL OWNERSHIP: Off-property Resident Farmer	FUTURE LAND USE: FEDERAL OWNERSHIP: Expanded Trespasser	FUTURE LAND USE: PRIVATE OWNERSHIP: On-property Resident Farmer (RME)
Ingestion		●	
Dermal Contact		●	
Inhalation			
Ingestion		●	
Dermal Contact		●	
External Radiation		●	
Ingestion			
Dermal Contact			
Inhalation			
Ingestion	●		●
Dermal Contact	●		●
Inhalation	●		●
Ingestion	●		●
Ingestion	●		●
Ingestion		●	●
Dermal Contact		●	●
External Radiation		●	●
Ingestion			
Dermal Contact			
External Radiation			
Inhalation	●	●	●

[a]GMA groundwater impacted simultaneously by AFP, IFP, and SF -- the LSP and SWL were not found to significantly impact groundwater.
[b]Maximum soil concentration in the South Field.

FIGURE B.3-1 CONCEPTUAL SITE MODEL FOR OPERABLE UNIT 2 - WIDE

to total receptor risk was from the dust affected beef and milk pathway. Primary contributing CPCs in this pathway include technetium-99 (7.8×10^{-3}), benzo(a)pyrene (5.4×10^{-3}), and dibenzo(a,h)anthracene (4.0×10^{-3}). Total HI was 23 due primarily to beryllium in groundwater (75 percent of the total hazard) and homegrown produce irrigated with groundwater contaminated with uranium-total (21.4 percent of the total hazard).

Estimated risks and hazards to the future, expanded trespasser are summarized in Table B.3.6-10 and B.3.6-11, respectively (Attachment B.III). Total risks were 8.5×10^{-5} due mostly to external radiation from radium-226, radium-228, thorium-228, and thorium-230 in soil, and radium-226 in sediment. Total HI was below 1.0.

Tables B.3.6-12 and B.2.6-13 summarize the risk and hazard to future receptors due to the cumulative impact of contaminants present within Operable Unit 2. It is emphasized that the risks and hazards presented are those resulting primarily from the three subunits contributing most to groundwater contamination: the Active Flyash Pile, South Field and Inactive Flyash Pile.

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TABLE B.3.6-12
FUTURE LAND USE
OU2 WIDE
SUMMARY OF TOTAL CARCINOGENIC RISK

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Surface Soil/ Air	CS-137	3.9E-07	0.52%	0.45%	1.9E-11	0.00%	0.00%	4.2E-05	0.36%	0.12%
	NP-237	1.9E-07	0.25%	0.22%	2.1E-08	0.16%	0.02%	4.3E-06	0.04%	0.01%
	PU-238	1.7E-09	0.00%	0.00%	1.1E-08	0.08%	0.01%	3.0E-07	0.00%	0.00%
	PU-239/240	5.5E-10	0.00%	0.00%	6.3E-09	0.05%	0.01%	2.0E-07	0.00%	0.00%
	RA-226	4.5E-05	59.93%	52.38%	8.9E-06	67.55%	7.86%	7.8E-03	68.39%	23.34%
	RA-228	4.0E-06	5.25%	4.59%	1.1E-07	0.84%	0.10%	4.7E-04	4.12%	1.41%
	SR-90	1.9E-09	0.00%	0.00%	2.1E-10	0.00%	0.00%	2.6E-07	0.00%	0.00%
	TC-99	3.1E-09	0.00%	0.00%	2.3E-09	0.02%	0.00%	8.7E-07	0.01%	0.00%
	TH-228	9.1E-06	11.99%	10.48%	6.9E-07	5.22%	0.61%	1.0E-03	9.14%	3.12%
	TH-230	2.5E-08	0.03%	0.03%	7.9E-07	6.00%	0.70%	1.7E-05	0.15%	0.05%
	TH-232	1.2E-05	15.19%	13.28%	8.8E-07	6.63%	0.77%	1.4E-03	12.55%	4.28%
	U-234	1.7E-08	0.02%	0.02%	4.6E-07	3.49%	0.41%	1.0E-05	0.09%	0.03%
	U-235/236	1.1E-07	0.15%	0.13%	4.5E-08	0.34%	0.04%	9.8E-06	0.09%	0.03%
	U-238	4.1E-07	0.54%	0.47%	1.0E-06	7.66%	0.89%	3.5E-05	0.31%	0.11%
	Total Radiological Risk	7.1E-05	93.88%	82.06%	1.3E-05	98.04%	11.40%	1.1E-02	95.25%	32.51%
	Aroclor-1254	2.9E-07	0.38%	0.34%	*N/A*	*N/A*	*N/A*	6.0E-06	0.05%	0.02%
	Aroclor-1260	1.7E-07	0.23%	0.20%	*N/A*	*N/A*	*N/A*	3.5E-06	0.03%	0.01%
	Arsenic	1.3E-06	1.69%	1.48%	1.6E-07	1.22%	0.14%	3.5E-05	0.31%	0.11%
	Benzo(a)anthracene	1.0E-07	0.13%	0.12%	3.7E-09	0.03%	0.00%	2.0E-05	0.17%	0.06%
	Benzo(a)pyrene	1.7E-06	2.26%	1.97%	6.2E-08	0.47%	0.05%	3.4E-04	2.98%	1.02%
	Benzo(b)fluoranthene	1.2E-07	0.15%	0.13%	4.1E-09	0.03%	0.00%	2.2E-05	0.20%	0.07%
	Benzo(k)fluoranthene	1.3E-08	0.02%	0.01%	4.9E-10	0.00%	0.00%	2.6E-06	0.02%	0.01%
	Beryllium	3.4E-07	0.45%	0.39%	1.0E-08	0.08%	0.01%	2.0E-05	0.18%	0.06%
	Dibenzo(a,h)anthracene	4.9E-07	0.65%	0.57%	1.3E-08	0.10%	0.01%	6.9E-05	0.60%	0.21%
	Dieldrin	9.2E-10	0.00%	0.00%	1.7E-10	0.00%	0.00%	1.2E-06	0.01%	0.00%
	Indeno(1,2,3-cd)pyrene	1.1E-07	0.14%	0.13%	4.0E-09	0.03%	0.00%	2.2E-05	0.19%	0.06%
	bis(2-ethylhexyl)phthalate	1.1E-09	0.00%	0.00%	*N/A*	*N/A*	*N/A*			
	Total Chemical Risk	4.6E-06	6.12%	5.35%	2.6E-07	1.96%	0.23%	5.4E-04	4.75%	1.62%
	Total	7.6E-05	100.00%	87.40%	1.3E-05	100.00%	11.63%	1.1E-02	100.00%	34.13%

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TABLE B.3.6-12
(Continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Sediment	NP-237	2.7E-08	0.32%	0.03%	N/A			N/A		
	PU-238	1.4E-10	0.00%	0.00%	N/A			N/A		
	PU-239/240	4.3E-11	0.00%	0.00%	N/A			N/A		
	RA-226	7.1E-06	84.84%	8.19%	N/A			N/A		
	RA-228	6.0E-07	7.14%	0.69%	N/A			N/A		
	SR-90	1.2E-10	0.00%	0.00%	N/A			N/A		
	TC-99	1.6E-10	0.00%	0.00%	N/A			N/A		
	U-234	6.3E-10	0.01%	0.00%	N/A			N/A		
	U-235/236	1.4E-08	0.16%	0.02%	N/A			N/A		
	U-238	3.5E-08	0.42%	0.04%	N/A			N/A		
	Total Radiological Risk	7.8E-06	92.90%	8.97%						
	Aroclor-1254	2.5E-09	0.03%	0.00%	N/A			N/A		
	Aroclor-1260	1.4E-09	0.02%	0.00%	N/A			N/A		
	Arsenic	2.4E-07	2.90%	0.28%	N/A			N/A		
	Benzo(a)anthracene	7.3E-09	0.09%	0.01%	N/A			N/A		
	Benzo(a)pyrene	2.5E-07	2.98%	0.29%	N/A			N/A		
	Benzo(b)fluoranthene	8.1E-09	0.10%	0.01%	N/A			N/A		
	Beryllium	4.6E-08	0.55%	0.05%	N/A			N/A		
	Dibenzo(a,h)anthracene	3.6E-08	0.43%	0.04%	N/A			N/A		
	Dieldrin	5.5E-10	0.01%	0.00%	N/A			N/A		
	Total Chemical Risk	5.9E-07	7.10%	0.69%						
	Total	8.4E-06	100.00%	9.65%						
Groundwater	NP-237	N/A			2.2E-07	0.36%	0.19%	2.0E-07	0.02%	0.00%
	SR-90	N/A			8.8E-08	0.15%	0.08%	4.8E-08	0.00%	0.00%
	TC-99	N/A			6.2E-08	0.10%	0.06%	1.2E-07	0.01%	0.00%
	U-234	N/A			2.0E-05	33.32%	17.53%	3.7E-04	33.52%	1.10%
	U-235/236	N/A			1.1E-06	1.77%	0.93%	2.0E-05	1.79%	0.06%
	U-238	N/A			3.8E-05	64.28%	33.82%	7.1E-04	64.66%	2.13%
	Total Radiological Risk				6.0E-05	99.99%	52.60%	1.1E-03	100.00%	3.29%
	Arsenic	N/A			4.8E-09	0.01%	0.00%			
	Beryllium	N/A			1.2E-09	0.00%	0.00%			
	Total Chemical Risk				6.0E-09	0.01%	0.01%			
	Total				6.0E-05	100.00%	52.61%	1.1E-03	100.00%	3.29%

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TABLE B.3.6-12
(Continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Surface Water	NP-237	1.7E-08	2.75%	0.02%	N/A			N/A		
	PU-238	8.5E-10	0.14%	0.00%	N/A			N/A		
	PU-239/240	9.9E-11	0.02%	0.00%	N/A			N/A		
	RA-226	5.0E-08	8.13%	0.06%	N/A			N/A		
	RA-228	1.1E-09	0.18%	0.00%	N/A			N/A		
	SR-90	7.3E-10	0.12%	0.00%	N/A			N/A		
	TC-99	2.4E-07	38.80%	0.28%	N/A			N/A		
	U-234	2.7E-08	4.41%	0.03%	N/A			N/A		
	U-235/236	2.9E-09	0.48%	0.00%	N/A			N/A		
	U-238	6.9E-08	11.21%	0.08%	N/A			N/A		
	Total Radiological Risk	4.1E-07	66.23%	0.47%						
	Aroclor-1254	8.1E-09	1.31%	0.01%	N/A			N/A		
	Aroclor-1260	6.4E-11	0.01%	0.00%	N/A			N/A		
	Arsenic	1.6E-07	25.41%	0.18%	N/A			N/A		
	Benzo(a)anthracene	2.1E-09	0.34%	0.00%	N/A			N/A		
	Benzo(a)pyrene	7.5E-09	1.21%	0.01%	N/A			N/A		
	Benzo(b)fluoranthene	2.5E-10	0.04%	0.00%	N/A			N/A		
	Beryllium	1.5E-08	2.37%	0.02%	N/A			N/A		
	Dibenzo(a,h)anthracene	2.1E-09	0.35%	0.00%	N/A			N/A		
	Dieldrin	1.7E-08	2.73%	0.02%	N/A			N/A		
	Total Chemical Risk	2.1E-07	33.77%	0.24%						
	Total	6.2E-07	100.00%	0.71%						
Homegrown Produce (Dust Affected)	CS-137	N/A			5.1E-10	0.00%	0.00%	5.4E-07	0.04%	0.00%
	NP-237	N/A			2.1E-09	0.01%	0.00%	6.1E-07	0.04%	0.00%
	PU-238	N/A			7.7E-10	0.01%	0.00%	1.5E-09	0.00%	0.00%
	PU-239/240	N/A			4.9E-10	0.00%	0.00%	1.0E-09	0.00%	0.00%
	RA-226	N/A			1.3E-05	86.39%	11.47%	4.6E-05	3.15%	0.14%
	RA-228	N/A			2.0E-07	1.36%	0.18%	7.5E-07	0.05%	0.00%
	SR-90	N/A			1.7E-09	0.01%	0.00%	1.9E-05	1.26%	0.06%
	TC-99	N/A			4.8E-09	0.03%	0.00%	3.6E-04	24.22%	1.07%
	TH-228	N/A			6.1E-09	0.04%	0.01%	2.6E-08	0.00%	0.00%
	TH-230	N/A			4.6E-09	0.03%	0.00%	2.0E-08	0.00%	0.00%
	TH-232	N/A			1.8E-08	0.12%	0.02%	7.4E-08	0.01%	0.00%
	U-234	N/A			3.6E-09	0.02%	0.00%	7.1E-07	0.05%	0.00%
	U-235/236	N/A			3.6E-10	0.00%	0.00%	7.3E-08	0.00%	0.00%
	U-238	N/A			6.9E-09	0.05%	0.01%	1.3E-06	0.09%	0.00%
	Total Radiological Risk				1.3E-05	88.07%	11.69%	4.3E-04	28.91%	1.28%
	Aroclor-1254	N/A			3.6E-08	0.24%	0.03%	6.3E-06	0.42%	0.02%
	Aroclor-1260	N/A			9.3E-09	0.06%	0.01%	8.3E-07	0.06%	0.00%
	Arsenic	N/A			3.0E-07	1.96%	0.26%	5.5E-05	3.73%	0.16%
	Benzo(a)anthracene	N/A			6.0E-08	0.40%	0.05%	6.0E-05	4.06%	0.18%
	Benzo(a)pyrene	N/A			9.9E-07	6.56%	0.87%	5.7E-04	38.62%	1.71%
	Benzo(b)fluoranthene	N/A			6.5E-08	0.43%	0.06%	3.7E-05	2.48%	0.11%
	Benzo(k)fluoranthene	N/A			7.8E-09	0.05%	0.01%	1.7E-06	0.11%	0.00%
	Beryllium	N/A			7.0E-08	0.46%	0.06%	4.4E-06	0.30%	0.01%
	Dibenzo(a,h)anthracene	N/A			2.0E-07	1.31%	0.17%	4.3E-05	2.92%	0.13%
	Dieldrin	N/A			7.7E-09	0.05%	0.01%	2.5E-04	17.10%	0.76%
	Indeno(1,2,3-cd)pyrene	N/A			6.2E-08	0.41%	0.05%	1.9E-05	1.30%	0.06%
	Total Chemical Risk				1.8E-06	11.93%	1.58%	1.0E-03	71.09%	3.14%
	Total				1.5E-05	100.00%	13.28%	1.5E-03	100.00%	4.42%

TABLE B.3.6-12
(Continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Homegrown Produce (Groundwater Affected)	NP-237	N/A			6.6E-08	0.95%	0.06%	6.2E-08	0.05%	0.00%
	SR-90	N/A			3.1E-08	0.44%	0.03%	1.7E-08	0.01%	0.00%
	TC-99	N/A			1.0E-09	0.01%	0.00%	5.5E-10	0.00%	0.00%
	U-234	N/A			2.3E-07	3.36%	0.20%	4.3E-07	0.35%	0.00%
	U-235/236	N/A			6.0E-06	87.09%	5.28%	1.1E-04	91.08%	0.33%
	U-238	N/A			5.6E-07	8.10%	0.49%	1.0E-05	8.50%	0.03%
	Total Radiological Risk				6.9E-06	99.97%	6.06%	1.2E-04	100.00%	0.00%
	Arsenic	N/A			1.9E-09	0.03%	0.00%			
	Beryllium	N/A			3.9E-10	0.01%	0.00%			
	Total Chemical Risk				2.2E-09	0.03%	5.57%			
	Total				6.9E-06	100.00%	6.06%	1.2E-04	100.00%	0.36%
Beef/Milk (Dust Affected)	CS-137	N/A			2.5E-09	0.02%	0.00%	5.5E-06	0.03%	0.02%
	NP-237	N/A			9.3E-12	0.00%	0.00%	3.6E-08	0.00%	0.00%
	PU-238	N/A			4.4E-14	0.00%	0.00%	2.2E-11	0.00%	0.00%
	PU-239/240	N/A			3.0E-14	0.00%	0.00%	1.5E-11	0.00%	0.00%
	RA-226	N/A			2.3E-06	17.00%	2.03%	1.1E-04	0.59%	0.34%
	RA-228	N/A			2.4E-08	0.18%	0.02%	1.8E-06	0.01%	0.01%
	SR-90	N/A			1.4E-09	0.01%	0.00%	8.3E-05	0.43%	0.25%
	TC-99	N/A			1.7E-08	0.13%	0.02%	7.8E-03	40.71%	23.44%
	TH-228	N/A			8.3E-12	0.00%	0.00%	6.2E-09	0.00%	0.00%
	TH-230	N/A			2.9E-11	0.00%	0.00%	4.6E-09	0.00%	0.00%
	TH-232	N/A			1.1E-10	0.00%	0.00%	1.8E-08	0.00%	0.00%
	U-234	N/A			5.1E-10	0.00%	0.00%	6.1E-07	0.00%	0.00%
	U-235/236	N/A			5.1E-11	0.00%	0.00%	6.3E-08	0.00%	0.00%
	U-238	N/A			9.7E-10	0.01%	0.00%	1.2E-06	0.01%	0.00%
	Total Radiological Risk				2.4E-06	17.34%	2.07%	8.0E-03	41.78%	24.06%
	Aroclor-1254	N/A			2.4E-07	1.75%	0.21%	4.9E-05	0.25%	0.15%
	Aroclor-1260	N/A			1.2E-06	8.74%	1.04%	2.1E-04	1.10%	0.63%
	Arsenic	N/A			1.0E-07	0.76%	0.09%	7.3E-05	0.38%	0.22%
	Benzo(a)anthracene	N/A			8.8E-08	0.65%	0.08%	1.6E-04	0.85%	0.49%
	Benzo(a)pyrene	N/A			4.0E-06	29.28%	3.50%	5.4E-03	28.07%	16.16%
	Benzo(b)fluoranthene	N/A			2.7E-07	1.98%	0.24%	3.7E-04	1.91%	1.10%
	Benzo(k)fluoranthene	N/A			1.9E-07	1.39%	0.17%	1.5E-04	0.80%	0.46%
	Beryllium	N/A			8.0E-09	0.06%	0.01%	4.2E-06	0.02%	0.01%
	Dibenzo(a,h)anthracene	N/A			4.4E-06	32.53%	3.89%	4.0E-03	20.79%	11.97%
	Dieldrin	N/A			4.2E-12	0.00%	0.00%	1.5E-07	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	N/A			7.5E-07	5.52%	0.66%	7.8E-04	4.05%	2.33%
	Total Chemical Risk				1.1E-05	82.66%	9.88%	1.1E-02	58.22%	33.53%
	Total				1.4E-05	100.00%	11.95%	1.9E-02	100.00%	57.58%

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TABLE B.3.6-12
(Continued)

Medium	Parameter	Expanded Trespasser	% Total Medium Risk	% Total Receptor Risk	Off-Property Res. Farmer (Priv. Own.)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Medium Risk	% Total Receptor Risk
Beef/Milk (Groundwater Affected)	NP-237	N/A			2.0E-10	0.03%	0.00%	1.9E-10	*0.00%*	0.00%
	SR-90	N/A			1.5E-08	2.24%	0.01%	8.2E-09	*0.07%*	0.00%
	TC-99	N/A			2.4E-09	0.36%	0.00%	1.3E-09	*0.01%*	0.00%
	U-234	N/A			2.3E-08	3.32%	0.02%	4.2E-08	*0.35%*	0.00%
	U-235/236	N/A			5.8E-07	86.00%	0.51%	1.1E-05	*91.07%*	0.03%
	U-238	N/A			5.4E-08	8.00%	0.05%	1.0E-06	*8.50%*	0.00%
	Total Radiological Risk				6.8E-07	99.95%	0.60%	1.2E-05	100.00%	0.04%
	Arsenic	N/A			3.4E-10	0.05%	0.00%	N/A		
	Beryllium	N/A			2.1E-11	0.00%	0.00%	N/A		
	Total Chemical Risk				3.6E-10	0.05%	0.00%			
	Total				6.8E-07	100.00%	0.60%	*1.2E-05*	100.00%	0.04%
Ambient Radon		1.9E-06		2.24%	4.4E-06		3.86%	6.0E-05		0.18%
ALL MEDIA		*8.7E-05*			*1.1E-04*			*3.3E-02*		

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TABLE B.3.6-13
FUTURE LAND USE
OU2 WIDE
SUMMARY OF NONCARCINOGENIC HAZARD

Medium	Parameter	Expanded Trespasser	% of Total Medium Hazard	% of Total Receptor Hazard	Off-Property Resident Farmer	% of Total Medium Hazard	% of Total Receptor Hazard	On-Property Resident Farmer (RME)	% of Total Medium Hazard	% of Total Receptor Hazard
Surface Soil/ Air	Arsenic	3.9E-03	42.72%	3.27%	N/D			6.2E-02	78.67%	0.27%
	Beryllium	4.9E-03	53.69%	4.11%	N/D			1.5E-02	19.50%	0.07%
	Dieldrin	1.8E-06	0.02%	0.00%	N/D			1.4E-03	1.83%	0.01%
	U-Total	2.9E-04	3.26%	0.25%	N/D			N/A		
	bis(2-ethylhexyl)phthalate	2.7E-05	0.30%	0.02%	N/D			N/A		
	Total	9.0E-03	100.00%	7.66%				7.8E-02	100.00%	0.34%
Sediment	Arsenic	2.7E-03	5.07%	2.29%	N/A			N/A		
	Beryllium	5.1E-03	9.58%	4.33%	N/A			N/A		
	Dieldrin	1.0E-04	0.19%	0.08%	N/A			N/A		
	U-TOTAL	4.5E-02	85.16%	38.45%	N/A			N/A		
	Total	5.3E-02	100.00%	45.15%						
Groundwater	Arsenic	N/A			9.2E-06	0.00%	0.00%			
	Beryllium	N/A			7.1E-08	0.00%	0.00%			
	U-total	N/A			9.1E-01	100.00%	24.91%	1.7E+01	100.00%	75.19%
	Total				9.1E-01	100.00%	24.91%	1.7E+01	100.00%	75.19%
Surface Water	***Arsenic***	***1.0E-03***	1.80%	0.85%	N/A			N/A		
	Beryllium	***6.2E-05***	0.11%	0.05%	N/A			N/A		
	Dieldrin	***1.2E-04***	0.22%	0.10%	N/A			N/A		
	U-total	***5.5E-02***	97.88%	46.21%	N/A			N/A		
	Total	***5.6E-02***	100.00%	47.21%	N/A			N/A		
Homegrown Produce (Dust Affected)	Arsenic	N/A			5.6E-04	97.76%	0.02%	1.0E-01	24.95%	0.45%
	Beryllium	N/A			3.2E-06	0.56%	0.00%	2.0E-04	0.05%	0.00%
	Dieldrin	N/A			9.6E-06	1.67%	0.00%	3.2E-01	75.01%	1.36%
	Total				5.7E-04	100.00%	0.02%	4.2E-01	100.00%	1.82%
Homegrown Produce (H20 Affected)	Arsenic	N/A			3.5E-06	0.00%	0.00%			
	Beryllium	N/A			1.8E-08	0.00%	0.00%			
	U-total	N/A			2.7E+00	100.00%	75.06%	5.0E+00	100.00%	21.43%
	Total				2.7E+00	100.00%	75.06%	5.0E+00	100.00%	21.43%
Beef/Milk (Dust Affected)	Arsenic	N/A			2.0E-04	99.81%	0.01%	1.4E-01	99.73%	0.60%
	Beryllium	N/A			3.7E-07	0.19%	0.00%	1.9E-04	0.14%	0.00%
	Dieldrin	N/A			5.3E-09	0.00%	0.00%	1.9E-04	0.13%	0.00%
	Total				2.0E-04	100.00%	0.01%	1.4E-01	100.00%	0.60%
Beef/Milk (H20 Affected)	Arsenic	N/A			6.5E-07	0.44%	0.00%			
	Beryllium	N/A			9.6E-10	0.00%	0.00%			
	U-total	N/A			1.5E-04	99.56%	0.00%	2.6E-03	100.00%	0.01%
	Total				1.5E-04	100.00%	0.00%	2.6E-03	100.00%	0.01%
ALL MEDIA		1.2E-01			3.7E+00			2.3E+01		

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B.4.0 SUMMARY OF HEALTH RISK CHARACTERIZATION

This section will focus on those subunits, receptors, exposure media, pathways, and COCs. COCs are CPCs that were found to pose a greater than $1x10^{-6}$ ILCR or 0.2 HI as a result of the health risk characterization. The CPCs determined through screening as defined in Section B.2.0 were assessed using the risk assessment methodology defined in Section B.2.0 to develop a health risk characterization for Operable Unit 2. Section B.3 describes the results of the health risk characterization in detail.

Receptors and exposure pathways were identified in this baseline risk assessment on the basis of FEMP risk assessment policy and Operable Unit 2 specific considerations of current land use and reasonable projections of future land use. Confidence is high that the exposure pathways and potential receptors likely to experience the greatest potential exposures, and thus risk have been identified and evaluated. Although additional receptors and activities could be identified, exposures would be similar to, or less than, those estimated for the specific receptors and pathways considered in this analysis. Standard (conservative) intake parameters were used for the assessment of all pathways to ensure that potential risks would not be likely to be underestimated.

The COCs determined through the health risk characterization are provided in Table B.4-0. A total of 22 COCs were determined across all subunits and pathways, 14 radionuclides, four metals, five PAHs, two PCBs, one semivolatile organic, and one pesticide. The Lime Sludge Ponds contain the least with 4 COCs while the South Field contains the most with 24 COCs. All of the exposure media have at least one COC, meaning that exposure to any media considered in the health risk characterization produces a ILCR greater than $1x10^{-6}$ for at least one receptor in at least one subunit. Direct exposure to surface soils result in the greatest number of COCs (22 COCs in the South Field), exposure to Great Miami River fish results in only 2 COCs for the South Field only. COCs were determined for 15 of the 18 receptors in at least one subunit; only the current off-property farmer and child, and the Great Miami River residential user did not have COCs.

The health risk characterization assessed eight current scenarios (trespassing youth, off-property resident farmer, off-property resident child, groundskeeper, user of milk/meat, and the Great Miami River recreational, residential, and agricultural users) and 13 future receptors (off-property resident farmer private and federal ownership, off-property resident child private and federal ownership,

TABLE B.4-0

OPERABLE UNIT 2 CONTAMINANTS OF CONCERN

Solid Waste Landfill	Lime Sludge Ponds	Inactive Flyash Pile	South Field	Active Flyash Pile
SURFACE SOIL				
neptunium-237 radium-226 radium-228 thorium-228 thorium-230 thorium-232 plutonium-238 uranium-234 uranium-235/236 uranium-238 antimony arsenic beryllium benzo(a)anthracene benzo(a)pyrene benzo(b)fluoranthene dibenzo(a,h)anthracene indeno(1,2,3-cd)pyrene	cesium-137 radium-226 radium-228 thorium-228 thorium-230 thorium-232 uranium-238 uranium-total	radium-226 radium-228 thorium-228 thorium-232 arsenic dibenzo(a,h)anthracene	cesium-137 neptunium-237 radium-226 radium-228 thorium-228 thorium-230 thorium-232 uranium-234 uranium-235/236 uranium-238 uranium-total arsenic beryllium Aroclor-1254 Aroclor-1260 benzo(a)anthracene benzo(a)pyrene benzo(b)fluoranthene benzo(k)fluoranthene dibenzo(a,h)anthracene dieldrin indeno(1,2,3-cd)pyrene	cesium-137 neptunium-237 radium-226 radium-228 thorium-228 thorium-232 arsenic beryllium
CROSS-MEDIA IMPACT ON SURFACE WATER				
uranium-total arsenic	no COCs	no COCs	uranium-total arsenic dieldrin	no COCs
CROSS-MEDIA IMPACT ON SEDIMENT				
uranium-total	no COCs	no COCs	radium-226	radium-226 arsenic
CROSS-MEDIA IMPACT ON GROUNDWATER				
no COCs	no COCs	uranium-234 uranium-235/236 uranium-238 *uranium-total*	uranium-234 uranium-235/236 uranium-238 *uranium-total*	uranium-234 uranium-238 uranium-total

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TABLE B.4-0
(continued)

Solid Waste Landfill	Lime Sludge Ponds	Inactive Flyash Pile	South Field	Active Flyash Pile
CROSS-MEDIA IMPACT ON PERCHED GROUNDWATER				
technetium-99 carbazole	neptunium-237 strontium-90 technetium-99	no COCs	no COCs	no COCs
CROSS-MEDIA IMPACT ON AIR				
radon-222	no COCs	radon-222	radon-222	radon-222
CROSS-MEDIA IMPACT FROM DUST ON BEEF/MILK AND HOMEGROWN PRODUCE				
neptunium-237 radium-226 strontium-90 uranium-234 uranium-238 arsenic beryllium benzo(a)anthracene benzo(a)pyrene benzo(b)fluoranthene dibenzo(a,h)anthracene indeno(1,2,3-cd)pyrene	no COCs	dibenzo(a,h)anthracene	cesium-137 radium-226 radium-228 strontium-90 technetium-99 uranium-238 arsenic beryllium Aroclor-1254 Aroclor-1260 benzo(a)anthracene benzo(a)pyrene benzo(b)fluoranthene benzo(k)fluoranthene dibenzo(a,h)anthracene dieldrin indeno(1,2,3-cd)pyrene	arsenic
CROSS-MEDIA IMPACT FROM GROUNDWATER ON BEEF/MILK AND HOMEGROWN PRODUCE				
no COCs	no COCs	uranium-234 uranium-235/236 uranium-238 uranium-total	uranium-234 uranium-235/236 uranium-238 uranium-total	radium-226 strontium-90 uranium-235/236 uranium-total
GREAT MIAMI RIVER SURFACE WATER CROSS-MEDIA IMPACT				
no COCs	no COCs	no COCs	radium-226 technetium-99	no COCs

expanded trespasser, on-property resident farmer RME, on-property resident farmer CT, on-property resident child, homebuilder, on-property perched groundwater user, and Great Miami River recreational, residential, and agricultural user). A detailed discussion of the receptors and the pathways that effect them is provided in Section B.2.2.2. The South Field contains COCs that impact 5 current and 11 future receptors. The South Field impacts all exposure media except perched water, which does not apply. The Solid Waste Landfill contains COCs that impact 2 current and 7 future receptors. The Solid Waste Landfill impacts all exposure media except Great Miami River surface water and fish. The Inactive Flyash Pile contains COCs that impact 2 current and 8 future receptors. The Inactive Flyash Pile impacts five of the 10 exposure media (surface soil, air, groundwater, produce, and livestock). The Active Flyash Pile contains COCs that impact 2 current and 5 future receptors. The Active Flyash Pile impacts six of the 10 exposure media (surface soil, sediment, air, groundwater, produce, and livestock). The Lime Sludge Ponds contain COCs that impact 2 current and 4 future receptors. The Lime Sludge Ponds impact four of the 10 exposure media (surface soil, air, perched groundwater, and livestock).

B.4.1 SUMMARY OF SUBUNIT-SPECIFIC RISKS

The following section summarizes the receptors, exposure media, pathways, and COCs for each subunit and for the Operable Unit 2 Wide assessment. The discussion has been focused on the receptors and pathways that have COCs (i.e. contribute greater than a $1x10^{-6}$ ILCR or 1.0 HI). The risk or hazard posed by other receptors and pathways have been discussed in Section B.3.0. Specific COCs that are discussed in this summary are those that contribute the predominant risk or hazard from a pathway to a receptor. Not all COCs are discussed in the text, but COC's contributing greater than 1 percent of a medium risk are listed in the tables of this section.

B.4.1.1 Active Flyash Pile

The Active Flyash Pile has two current receptors that have at least one COC, the trespassing youth and the groundskeeper. The current receptors and COCs for the Active Flyash Pile are listed in Table B.4-1. The groundskeeper has the highest current risk for the Active Flyash Pile ($8.0x10^{-5}$). Eighty-seven percent of the groundskeeper's risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, and thorium-232 in surface soil, the remainder is due to dermal contact with surface soil. The trespassing youth has the next highest current risk ($2.6x10^{-5}$). Seventy-two percent of the total trespassing youth risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, and thorium-232 in surface soil. Another 15 percent of the

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TABLE B.4-1

ACTIVE FLYASH PILE
CURRENT LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Receptor Risk	Off-Property Resident Farmer	% Total Receptor Risk
Soil:				
Cesium-137	-[b]	-	-	-
Neptunium-237	-	-	-	-
Radium-226	6.0E-06	23.27%	-	-
Radium-228	2.0E-06	7.69%	-	-
Thorium-228	4.6E-06	17.85%	-	-
Thorium-232	4.9E-06	19.02%	-	-
Arsenic	2.1E-06	8.27%	-	-
Beryllium	-	-	-	-
Sediment:				
Radium-226	2.0E-06	7.73%	N/A	
Arsenic	1.0E-06	3.97%	N/A	

See footnotes at end of table

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TABLE B.4-1
(Continued)

Medium/ Parameter	Off-Property Resident Child	% Total Receptor Risk	Groundskeeper	% Total Receptor Risk
Soil:				
Cesium-137	-	-	1.5E-06	1.85%
Neptunium-237	-	-	2.0E-06	2.54%
Radium-226	-	-	2.2E-05	28.19%
Radium-228	-	-	7.4E-06	9.27%
Thorium-228	-	-	1.7E-05	21.53%
Thorium-232	-	-	1.8E-05	22.95%
Arsenic	-	-	8.3E-06	10.42%
Beryllium	-	-	2.0E-06	2.48%
Sediment:				
Radium-226	N/A		N/A	
Arsenic	N/A		N/A	

[a]Surface water, home grown produce (dust affected), and beef/milk (dust affected) pathways do not have any COCs associated with it, therefore, was not included in this table.

[b]No risk greater than the threshold level of 1×10^{-6}.

[c]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

trespassing youth's risk is from external radiation and dermal contact with sediment. No current receptor has an HI greater than 1.0.

The Active Flyash Pile has five future receptors that have associated COCs. The future receptors and COCs for the Active Flyash Pile are listed in Tables B.4-2a and B.4-2b. The RME on-property farmer has the highest ILCR of all Active Flyash Pile receptors ($8.4x10^{-5}$ total risk) due predominantly to ingestion of groundwater (576 percent of total) containing uranium-234, and uranium-238, ingestion of groundwater effected produce (29 percent of total) containing strontium-90, radium-226, and uranium-235/236, and ingestion of groundwater effected beef/milk (7 percent of total) containing strontium-90. The RME farmer has a total HI of less than 1.0. The on-property child has a total ILCR of $5.7x10^{-6}$ due to ingestion of groundwater (35 percent of total risk) containing uranium-238, and ingestion of groundwater affected produce, beef and milk (60 percent of total) containing uranium-238. The on-property child has an HI of 2.8 due to ingestion of groundwater containing Uranium-Total and ingestion of vegetables and fruit and beef/milk containing Uranium-Total. The expanded trespasser has a total ILCR of $4.9x10^{-5}$ due to external radiation from radium-226, radium-228, thorium-228, thorium-232, and dermal contact with arsenic in surface soil (90 percent of total). The expanded trespasser has 8 percent of their total risk from external radiation of radium-226 and dermal contact with arsenic in sediment. The expanded trespasser did not have an HI of greater than 1.0. The CT on-property farmer has a total ILCR of $4.8x10^{-6}$ due to ingestion of groundwater (59 percent total risk) containing uranium-238, and ingestion of groundwater effected produce (27 percent of total risk). The CT on-property farmer has an HI of less than 1.0.

The off-property farmer (private and federal ownership) has an ILCR of $1.1x10^{-5}$ due predominantly to ingestion of groundwater (59 percent of total) containing uranium-234 and uranium-238, and ingestion of groundwater effected produce (28 percent of total risk) containing strontium-90. The off-property farmers have a total HI of less than 1.0.

B.4.1.2 South Field

The South Field has five current receptors that have at least one COC, the trespassing youth, groundskeeper, user of milk and meat, and the Great Miami River recreational and agricultural users. The current receptors and COC's for the South Field are listed in Tables B.4-3a and B.4-3b. The groundskeeper has the highest current risk for the South Field ($2.2x10^{-4}$). Ninety five percent of the groundskeeper's risk is due predominantly to external radiation from radium-226, thorium-228, and

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TABLE B.4-2a

ACTIVE FLYASH PILE
FUTURE LAND USE
SUMMARY OF COC TOTAL CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	Off-Property Resident Farmer[c]	% Total Receptor Risk
Soil:				
Neptunium-237	1.1E-06	2.22%	-[d]	-
Radium-226	1.2E-05	25.25%	-	-
Radium-228	4.1E-06	8.33%	-	-
Thorium-228	9.6E-06	19.33%	-	-
Thorium-232	1.0E-05	20.60%	-	-
Arsenic	5.3E-06	10.75%	-	-
Sediment:				
Radium-226	2.0E-06	4.00%	N/A	
Arsenic	1.0E-06	2.11%	N/A	
Groundwater:				
Uranium-234	N/A[e]		2.0E-06	18.74%
Uranium-238	N/A		3.9E-06	36.24%
Home Grown Produce (Dust Affected):				
Arsenic	N/A		-	-
Home Grown Produce (Groundwater Affected):				
Strontium-90	N/A		1.6E-06	14.61%
Ambient Radon	-		-	

See footnotes at end of table

TABLE B.4-2a
(Continued)

Medium/ Parameter	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk
Soil:						
Neptunium-237	-	-	-	-		
Radium-226	-	-	-	-		
Radium-228	-	-	-	-		
Thorium-228	-	-	-	-		
Arsenic	-	-	-	-		
Beryllium	-	-	-	-		
Sediment:						
Neptunium-237	N/A	-	-	-	-	-
Radium-228	N/A	-	-	-	-	-
Thorium-228	N/A	-	-	-	-	-
Groundwater:						
Uranium-234	1.6E-05	18.58%	-	-	-	-
Uranium-238	3.0E-05	35.81%	1.8E-06	37.25%	1.3E-06	22.41%
Home Grown Produce (Dust Affected):						
Arsenic	1.2E-06	1.43%	-	-	-	-
Home Grown Produce (Groundwater Affected):						
Radium-226	6.5E-06	7.81%	-	-	-	-
Strontium-90	1.2E-05	14.49%	-	-	-	-
Uranium 235/236	5.2E-06	6.17%	-	-	-	-
Beef/Milk (Groundwater Affected):						
Strontium-90	6.0E-06	7.22%	-	-	1.1E-06	19.69%
Ambient Radon	1.5E-06		-	-	-	-

See footnotes at end of table

TABLE B.4-2a
(Continued)

[a]Surface water, home grown produce (groundwater affected), and beef/milk (dust affected) pathways do not have any COCs associated with it, therefore, was not included in this table.

[b]Great Miami River user (Adult) and Great Miami River user (Youth) receptors did not have any COCs associated with them, therefore, were not included in this table.

[c]Off-property resident private and federal ownership pose the same risk.

[d]No risk greater than the threshold level of 1×10^{-6}.

[e]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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TABLE B.4-2b

ACTIVE FLYASH PILE
FUTURE LAND USE
SUMMARY OF COC TOTAL NONCARCINOGENIC HAZARD CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Off-Property Child	% Total Medium Risk	% Total Receptor Risk	On-Property Farmer (RME)	% Total Medium Risk	% Total Receptor Risk	On-Property Farmer (CT)	% Total Medium Risk	% Total Receptor Risk	On-Property Resident Child	% Total Medium Risk	% Total Receptor Risk
Groundwater:												
Uranium-Total	2.3E-01	99.99%	28.47%	7.5E-01	100.00%	75.70%	3.5E-01	100.00%	77.42%	1.7E+00	100.00%	62.14%
Home Grown Produce (Groundwater Affected):												
Uranium-Total	5.4E-01	100.00%	67.84%	2.1E-01	100.00%	21.57%	-	-	-	8.2E-01	100.00%	29.63%
Beef/Milk (Groundwater Affected):												
Uranium-Total	-[d]	-	-	-	-	-	-	-	-	2.1E-01	100.00%	7.46%

[a]Expanded Trespasser and Off-Property Farmer receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]Soil, surface water, sediment, home grown produce (dust affected), and beef/milk (dust affected) pathways do not have any COCs associated with them, therefore, were not included in this table.

[c]Off-property resident private and federal ownership pose the same risk

[d]No hazard greater than the threshold level of 0.2.

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TABLE B.4-3a

SOUTH FIELD
CURRENT LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/	Trespassing	% Total	User of Milk	% Total	Groundskeeper	% Total	Great Miami River	% Total
Soil:								
Radium-226	4.0E-05	39.24%			1.5E-04	68.03%	N/A	
Radium-228	2.4E-06	2.38%	N/A[b]		9.0E-06	4.10%	N/A	
Thorium-228	5.3E-06	5.22%	N/A		2.2E-05	9.84%	N/A	
Thorium-232	7.3E-06	7.17%			2.7E-05	12.45%	N/A	
Benzo(a)pyrene	2.2E-06	2.19%	N/A		6.7E-06	3.05%	N/A	
Sediment:								
Radium-226	1.3E-05	13.07	N/A		N/A		-	-
Surface Water:								
Arsenic	3.7E-06	3.64%	N/A		N/A		-	-
Dieldrin	2.3E-05	23.04%	N/A		N/A		-	-
Radium-226	-	-	N/A		N/A		1.3E-06	30.40%
Technetium-99	-	-	N/A		N/A		2.0E-06	46.33%
Beef/Milk (Dust								
Benzo(a)pyrene	N/A		1.5E-6	34.68%	N/A			
Dibenzo(a,h)anthracene	N/A		1.7E-06	38.77%	N/A		-	-

[a]Off-Property Resident Farmer and Child receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]No risk greater than the threshold of a x 10^{-6}.

[c]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

TABLE B.4-3b

SOUTH FIELD
CURRENT LAND USE
SUMMARY OF COC NONCARCINOGENIC RISK CONTRIBUTIONS[a]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Receptor Risk
Surface Water:		
U-Total	5.3E+01	99.54%

[a]Off-Property Resident Farmer and Child receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]No hazard greater than the threshold level of 0.2.

[c]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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thorium-232 in surface soil. The trespassing youth has the next highest current risk ($1x10^{-4}$) and the only hazard greater than one (HI of 53 due to dermal contact with Uranium-Total in surface water). Fifty-four percent of the total trespassing youth's risk is due predominantly to external radiation from radium-226, thorium-228, and thorium-232 in surface soil, another 13 percent is due to external radiation from radium-226 in sediment, and 26 percent due to dermal contact with arsenic and dieldrin in surface water. The user of milk and meat receives a total $4.5x10^{-6}$ ILCR from ingestion of predominantly Aroclor-1260, benzo(a)anthracene and dibenzo(a,h)anthracene in beef and milk that is effected by dust deposition. The Great Miami River recreational user receives a $4.2x10^{-6}$ ILCR (76 percent of total receptor risk) from ingestion of radium-226 (30 percent) and technetium-99 (46 percent) in fish. The Great Miami River agricultural user receives a $4.4x10^{-6}$ ILCR due to ingestion of Great Miami River water effected beef/milk containing technetium-99.

The South Field has 10 future receptors that have associated COCs. The future receptors and COC's for the South Field are listed in Tables B.4-4a and B.4-4b. The RME on-property farmer has the highest ILCR of all South Field receptors ($3.4x10^{-2}$ total) due predominantly to inhalation, and external radiation with surface soil (33 percent of total containing radium-226, thorium-228, and thorium-232), and ingestion of soil effected beef/milk (59 percent of total receptor risk) containing technetium-99, benzo(a)pyrene, and dibenzo(a,h)anthracene. The RME farmer has a total HI of 23 due to ingestion of groundwater (76 percent from Uranium-Total) and ingestion of groundwater effected vegetables and fruit (22 percent from Uranium-Total).

The on-property child has a total ILCR of $9.2x10^{-3}$ due to inhalation and external radiation with radium-226 and thorium-232, and benzo(a)pyrene in surface soil (11 percent of total), and ingestion of soil effected beef/milk (84 percent of total) containing technetium-99, benzo(a)pyrene, and dibenzo(a,h)anthracene. The on-property child has the highest HI of the South Field receptors (63) due to ingestion of groundwater (65 percent from Uranium-Total), and ingestion of groundwater effected vegetables and fruit (31 percent from Uranium-Total).

The CT on-property farmer has a total ILCR of $2x10^{-3}$ due to inhalation and external radiation with radium-226, thorium-228,and thorium-232 in surface soil (44 percent of total), and ingestion of soil effected beef/milk (46 percent of total) containing technetium-99, benzo(a)pyrene, and dibenzo(a,h)anthracene. The CT on-property farmer has an HI of 11 due primarily to ingestion of

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TABLE B.4-4a

SOUTH FIELD
FUTURE LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	Off-Property Resident Farmer	% Total Receptor Risk	Off-Property Resident Child	% Total Receptor Risk	Great Miami River Recreational User	% Total Receptor Risk	Great Miami River Agricultural User	% Total Receptor Risk
Soil:										
Radium-226	8.3E-05	59.89%	-	-	-	-	N/A		N/A	
Radium-228	5.0E-06	3.62%	-	-	-	-	N/A		N/A	
Thorium-228	1.1E-05	7.94%	1.0E-06	0.97%	-	-	N/A		N/A	
Thorium-230	-	-	1.2E-06	1.13%	-	-	N/A		N/A	
Thorium-232	1.5E-05	10.91	1.3E-06	1.24%	-	-	N/A		N/A	
Arsenic	-	-	-	-	-	-	N/A		N/A	
Benzo(a)pyrene	3.3E-06	2.36%	-	-	-	-	N/A		N/A	
Sediment:										
Radium-226	1.3E-05	9.51%	N/A		N/A		N/A		N/A	
Groundwater:										
Uranium-234	-	-	1.9E-05	17.55%	-	-	N/A		N/A	
Uranium-235/236	-	-	1.0E-06	0.94%	-	-	N/A		N/A	
Uranium-238	-	-	3.6E-05	33.91%	1.6E-06	10.39%	N/A		N/A	
Surface Water:										
Radium-226	N/A		N/A		N/A		1.3E-06	30.40%	N/A	
Technetium-99	N/A		N/A		N/A		2.0E-06	46.33%	N/A	
Home Grown Produce (Dust Affected):										
Benzo(a)pyrene	N/A		1.5E-06	1.42%	-	-	N/A		N/A	

See footnotes at end of table

TABLE B.4-4a
(Continued)

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	Off-Property Resident Farmer	% Total Receptor Risk	Off-Property Resident Child	% Total Receptor Risk	Great Miami River Recreational User	% Total Receptor Risk	Great Miami River Agricultural User	% Total Receptor Risk
Home Grown Produce (Groundwater Affected):										
Uranium-234	N/A		5.7E-06	5.29%	-	-	N/A		N/A	
Uranium-238	N/A		1.1E-05	10.22%	-	-	N/A		N/A	
Beef/Milk (Dust Affected):										
Aroclor-1260	N/A		1.8E-06	1.71%	1.1E-06	7.03%	N/A		N/A	
Benzo(a)pyrene	N/A		6.1E-06	5.73%	3.5E-06	23.57%	N/A		N/A	
Dibenzo(a,h)anthracene	N/A		6.8E-06	6.32%	3.9E-06	26.00%	N/A		N/A	
Indeno(1,2,3-cd)pyrene	N/A		1.2E-06	1.08%	-	-	N/A		N/A	
Beef/Milk (Groundwater Affected):										
Technetium-99	N/A		N/A	-	N/A	-	N/A		4.3E-06	97.31%
Uranium-238	N/A		1.1E-06	1.00%	-	-	N/A		-	-
Ambient Radon	1.9E-06	1.39%	4.4E-06	5.06%	-	-	N/A		N/A	

See footnotes at end of table

TABLE B.4-4a
(Continued)

Medium/ Parameter	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk	Home-Builder	% Total Receptor Risk
Soil:								
Cesium-137	4.2E-5	0.12%	3.5E-6	0.17%	3.1E-6	0.03%	-	-
Neptinium-237	4.3E-6	0.01%	-	-	-	-	-	-
Radium-226	7.8E-03	23.18%	6.5E-04	31.68%	5.9E-04	6.34%	2.6E-06	22.44%
Radium-228	4.7E-04	1.40%	3.9E-05	1.92%	3.5E-05	0.38%	-	
Thorium-228	1.0E-03	3.10%	8.7E-05	4.25%	7.7E-05	0.84%	1.6E-06	13.85%
Thorium-232	1.4E-03	4.25%	1.2E-04	5.84%	1.1E-04	1.15%	2.1E-06	18.66%
Uranium-234	9.9E-6	0.03%						
Uranium-235/236	9.8E-6	0.03%						
Uranium-238	3.5E-6	0.10%	2.7E-6	0.13%	1.5E-6	0.02%		
Arsenic	3.3E-05	0.11%	1.7E-06	0.08%	1.4E-05	0.15%	1.1E-06	9.46%
Beryllium	2.0E-05	0.06%	-	-	8.9E-06	0.10%	-	-
Chromium	1.3E-05	0.35%	-	-	1.1E-06	0.25%	-	-
Benzo(a)pyrene	3.4E-04	1.03%	1.6E-05	0.80%	1.5E-04	1.63%	-	-
Dibenzo(a,h)-anthracene	6.9E-05	0.21%	3.2E-06	0.16%	3.0E-05	0.33%	-	-
Sediment:								
Radium-226	N/A		N/A		N/A		N/A	
Groundwater:								
Uranium-234	3.7E-04	1.09%	2.2E-05	1.08%	1.6E-05	0.17%	N/A	
Uranium-235/236	2.0E-05	0.06%	1.2E-06	0.06%	-	-	N/A	
Uranium-238	7.1E-04	2.11%	4.3E-05	2.09%	3.0E-05	0.33%	N/A	
Home Grown Produce (Dust Affected):								
Radium-226	4.7E-05	0.14%	2.6E-06	0.13%	3.3E-06	0.04%	N/A	
Strontium-90	1.9E-05	0.06%	1.0E-06	0.05%	1.3E-06	0.01%	N/A	

See footnotes at end of table

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TABLE B.4-4a
(Continued)

Medium/ Parameter	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk	Home-Builder	% Total Receptor Risk
Uranium-238	-	-	-	-	-	-	-	
Technetium-99	3.6E-04	1.06%	2.0E-05	0.96%	2.5E-05	0.27%	N/A	
Arsenic	5.5E-05	0.16%	3.0E-06	0.15%	1.8E-05	0.20%	N/A	
Benzo(a)anthracene	6.0E-05	0.18%	3.0E-06	0.16%	2.0E-05	0.21%	N/A	
Benzo(a)pyrene	5.7E-04	1.70%	3.1E-05	1.53%	1.9E-04	2.02%	N/A	
Benzo(b)fluoranthene	3.7E-05	0.11%	2.0E-06	0.10%	1.2E-05	0.13%	N/A	
Dibenzo(a,)anthracene	4.3E-05	0.13%	2.4E-06	0.12%	1.4E-05	0.15%	N/A	
Dieldrin	2.5E-04	0.75%	1.4E-05	0.68%	8.3E-05	0.90%	N/A	
Indeno(1,2,3-cd)pyrene	1.9E-06	0.06%	1.1E-05	0.05%	6.3E-06	0.07%	N/A	
Home Grown Produce (Groundwater Affected):								
Uranium-234	1.1E-04	0.33%	6.1E-06	0.30%	7.8E-06	0.08%	N/A	
Uranium-235/236	5.9E-06	0.02%	-	-	-	-	N/A	
Uranium-238	2.1E-04	0.64%	1.2E-06	0.57%	1.5E-05	0.16%	N/A	
Beef/Milk (Dust Affected):							N/A	
Cesium-137	5.5E-06	0.02%	-	-	-	-	N/A	
Radium-226	1.1E-04	0.34%	5.3E-06	0.26%	2.0E-05	0.21%	N/A	
Radium-228	1.8E-06	0.01%	-	-	-	-	N/A	
Technetium-99	7.8E-03	23.28%	3.7E-04	18.09%	1.3E-03	14.04%	N/A	
Aroclor-1254	4.9E-05	0.14%	2.5E-06	0.12%	2.8E-05	0.30%	N/A	
Aroclor-1260	2.1E-04	0.63%	1.1E-05	0.52%	1.2E-04	1.31%	N/A	
Arsenic	7.3E-05	0.22%	4.1E-05	0.20%	1.7E-05	0.19%	N/A	
Benzo(a)anthracene	1.6E-04	0.49%	8.2E-06	0.41%	9.4E-05	1.02%	N/A	
Benzo(a)pyrene	5.4E-03	16.06%	2.7E-04	13.33%	3.1E-03	33.57%	N/A	
Benzo(b)-fluoranthene	3.7E-06	1.09%	1.9E-05	0.91%	2.1E-04	2.28%	N/A	
Benzo(k)-fluoranthene	1.5E-04	0.46%	7.8E-06	0.38%	8.9E-05	0.96%	N/A	
Dibenzo(a,h)-anthracene	4.0E-03	11.90%	2.04E-04	9.88%	2.3E-03	24.87%	N/A	

See footnotes at end of table

TABLE B.4-4a
(Continued)

Medium/ Parameter	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk	Home-Builder	% Total Receptor Risk
Indeno(1,2,3-cd)pyrene	7.8E-04	2.32%	3.9E-05	1.92%	4.5E-04	4.84%	N/A	
Beef/Milk (Groundwater Affected):								
Uranium-234	1.1E-05	0.03%	-	-	2.0E-06	0.02%	N/A	
Uranium-238	2.1E-05	0.06%	-	-	3.8E-06	0.04%	N/A	
Ambient Radon	6.0E-05	0.18%	4.4E-06	0.22%	1.1E-06	0.01%	N/A	

[a]Homebuilder, Great Miami River User (Adult), and Great Miami River User (Youth) receptors did not have any COCs associated with them, therefore, were not included within this table.
[b]Surface water pathway did not have any COCs associated with carcinogenic risk, therefore, were not included in this table.
[c]No risk greater then the threshold level of 1×10^{-6}.
[d]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

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TABLE B.4-4b

SOUTH FIELD
FUTURE LAND USE
SUMMARY OF COC NONCARCINOGENIC HAZARD CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Off-Property Resident Farmer	% Total Receptor Risk	Off-Property Resident Child	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk	Home-builder	% Total Receptor Risk
Soil:												
Arsenic	-[c]	-	-	-	-	-	-	-	3.1E-01	0.55%	3.9E-01	72.34%
Groundwater:												
Uranium-Total	8.6E-01	76.80%	2.1E+00	67.65%	1.8E+01	75.66%	8.2E+00	77.19%	4.1E+01	65.14%	3.9E-01	72.34%
Home Grown Produce (Dust Affected):												
Dieldrin	-	-	-	-	3.2E-01	1.34%	-	-	1.2E+00	1.93%	N/A	
Home Grown Produce (Groundwater Affected):												
Uranium-Total	2.6E-01	23.11%	1.0E+00	32.21%	5.1E+00	21.53%	2.2E+00	20.24%	1.9E+01	31.02%	N/A	
Beef/Milk (Dust Affected):												
Aroclor-1254	-	-	-	-	-	-	-	-	3.8E-01	0.61%	N/A	

[a]Expanded Trespasser receptor does not have any COCs associated with them, therefore, was not included in this table.

[b]Sediment, and surface water, pathways do not have any COCs associated with the hazard and therefore, were not included in this table.

[c]No hazard greater than the threshold level of 0.2.

groundwater (77 percent from Uranium-Total), ingestion of groundwater effected vegetables and fruit (20 percent from Uranium-Total).

The expanded trespasser has a total ILCR of $1.4x10^{-4}$ due to external radiation from radium-226, radium-228, thorium-228, thorium-232 in surface soil (83 percent of total), and external radiation of mostly radium-226 in sediment (11 percent of total risk). The expanded trespasser did not have an HI of greater than 1.0. The off-property farmer (private ownership) has a total ILCR of $1.1x10^{-4}$ due predominantly to ingestion of uranium-34, uranium-235, and uranium-238 in groundwater (52 percent of total risk), and ingestion of dust effected beef/milk (16 percent of total) containing Aroclor 1260, benzo(a)pyrene, and dibenzo(a,h)anthracene. Four percent of the off-property farmer (private ownership) total ILCR comes from inhalation of ambient radon. The off-property farmer (private ownership) HI is 1.1 due to Uranium-Total in groundwater. The off-property farmer (federal ownership) has a total ILCR of $7x10^{-5}$ and an HI of 1.1 due to the ingestion of uranium-234, uranium-235/236, uranium-238, and Uranium-Total in groundwater.

The off-property child (private ownership) has a ILCR of $1.5x10^{-5}$ due to ingestion of dust effected beef/milk (66 percent of total risk) containing Aroclor 1260, benzo(a)pyrene, and dibenzo(a,h)anthracene, and ingestion of groundwater (16 percent of total risk) containing uranium-238. The off-property child (private ownership) has an HI of 3.1 caused by the ingestion of groundwater (an HI of 2.1), and the vegetables and fruit irrigated with groundwater (an HI of 1). The future off-property child (federal ownership) has a ILCR of $4.2x10^{-6}$ due to the ingestion of groundwater containing (57 percent of total) uranium-234 and uranium-238, and has an HI of 3.1 due primarily to ingestion of groundwater containing Uranium-Total. The on-property homebuilder receives an ILCR of $1.1x10^{-5}$ due to external radiation and dermal contact with subsurface soils containing predominantly radium-226, thorium-228, thorium-232, and arsenic. The homebuilder does not receive an HI greater than 1.0. The Great Miami River recreational user receives an ILCR of $4.2x10^{-6}$ due predominantly to the consumption of fish containing radium-226 and technetium-99. The Great Miami River agricultural user receives an ILCR of $4.4x10^{-6}$ due predominantly to the consumption of beef/milk containing technetium-99.

B.4.1.3 Inactive Flyash Pile

The Inactive Flyash Pile has two current receptors that have at least one COC, the trespassing youth and the groundskeeper. The current receptors for the Inactive Flyash Pile are listed in Table B.4-5.

TABLE B.4-5

INACTIVE FLYASH PILE
CURRENT LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Receptor Risk	Groundskeeper	% Total Receptor Risk
Soil:				
Radium-226	2.6E-06	16.59%	9.6E-06	19.45%
Radium-228	1.4E-06	9.02%	5.2E-06	10.52%
Thorium-228	3.2E-06	21.06%	1.2E-05	24.55%
Thorium-232	4.2E-06	27.50%	1.6E-05	32.07%
Arsenic	-	-	3.0E-06	6.13%
Dibenzo(a,h)anthracene	-	-	1.6E-06	3.17%
Sediment:	-[b]	-		
Surface Water:	-	-		
Home Grown Produce (Dust Affected):	N/A[c]		N/A	
Beef/Milk (Dust Affected):	N/A		N/A	

[a]Off-Property Resident Farmer Child, User of Milk and Meat, and Great Miami River Users Receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]No risk is greater than the threshold level of 1×10^{-6}.

[c]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

The groundskeeper has the highest current risk for the Inactive Flyash Pile ($5.0x10^{-5}$). Ninety percent of the groundskeeper's risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, and thorium-232 in surface soil, the remainder is due to dermal contact with surface soil. The trespassing youth has the next highest current risk ($1.5x10^{-5}$). Eighty-four percent of the total expanded trespassing youth risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, and thorium-232 in surface soil. No current receptor has an HI greater than 1.0.

The Inactive Flyash Pile has eight future receptors that have associated COCs. The future receptors for the Inactive Flyash Pile are listed in Tables B.4-6a and B.4-6b. The RME on-property farmer has the highest ILCR of all Inactive Flyash Pile receptors ($1.5x10^{-3}$ total risk) due predominantly to ingestion of groundwater (76 percent of total) and groundwater effected produce (23 percent) containing uranium-234, uranium-235/236, and uranium-238. The RME farmer has a total HI of 22 due to ingestion of groundwater and groundwater affected produce containing Uranium-Total. The on-property child has a total ILCR of $7.7x10^{-5}$ due to ingestion of groundwater (60 percent of total risk) containing uranium-234 and uranium-238, and ingestion of groundwater affected produce (30 percent of total) containing uranium-234 and uranium-238. The on-property child has an HI of 65 due to ingestion of groundwater containing Uranium-Total and ingestion of vegetables, fruit and beef/milk containing Uranium-Total. The CT on-property farmer has a total ILCR of $8.6x10^{-5}$ due to ingestion of groundwater (77 percent total risk) containing uranium-234, uranium-235/236, uranium-238. The CT on-property farmer has an HI of 9.8 due to ingestion of groundwater (84 percent of total risk) containing Uranium-Total, and ingestion of vegetables and fruit containing Uranium-Total.

The off-property farmer (private and federal ownership) has an ILCR of $7.5x10^{-5}$ due predominantly to ingestion of groundwater (75 percent of total) containing uranium-235/236, and uranium-238, and ingestion of groundwater affected produce (22 percent of total) containing uranium-234 and uranium-238. The off-property farmers have a total HI of less than 1.0. The off-property child (private and federal ownership) has a total ILCR of $4.0x10^{-6}$ due to ingestion of groundwater (60 percent of total risk) containing uranium-238. The on-property child has an HI of 2.5 due to ingestion of groundwater containing Uranium-Total. The expanded trespasser has a total ILCR of $3.0x10^{-5}$ due to external radiation from radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in surface soil (91 percent of total). The expanded trespasser did not have an HI of greater than 1.0.

0004444

TABLE B.4-6a

INACTIVE FLYASH PILE
FUTURE LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	Off-Property Resident Farmer[c]	% Total Receptor Risk	Great Miami River User	% Total Receptor Risk
Soil:						
Radium-226	5.4E-06	17.88%	-	-	N/A	
Radium-228	2.9E-06	9.71%	-	-	N/A	
Thorium-228	6.8E-06	22.65%	-	-	N/A	
Thorium-232	8.9E-06	29.58%	-	-	N/A	
Arsenic	2.0E-06	6.52%	-	-	N/A	
Groundwater:						
Uranium-234	N/A[d]		1.9E-05	24.98%	N/A	
Uranium-235/236	N/A		1.0E-06	1.33%	N/A	
Uranium-238	N/A		3.6E-05	48.26%	N/A	
Homegrown Produce (Groundwater Affected)					N/A	
Uranium-234	N/A		5.7E-06	7.53%	N/A	
Uranium-238	N/A		1.1E-05	14.54%	N/A	
Beef/Milk (Dust Affected)						
Dibenzo(a,h)anthracene	N/A				N/A	
Beef/Milk (Groundwater Affected):						
Uranium-234	N/A		-	-	N/A	
Uranium-238	N/A		1.1E-06	1.42%	N/A	
Ambient Radon:	-	-	-	-	N/A	

See footnotes at end of table

TABLE B.4-6a
(Continued)

Medium/ Parameter	Off-Property Resident Child[f]	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk
Soil:								
Radium-226	-	-	-	-	-	-	-	-
Radium-228	-	-	-	-	-	-	-	-
Thorium-228	-	-	-	-	-	-	-	-
Thorium-232	-	-	-	-	-	-	-	-
Arsenic	-	-	-	-	-	-	-	-
Groundwater:								
Uranium-234	-	-	3.7E-04	25.06%	2.2E-05	25.67%	1.6E-05	20.34%
Uranium-235/236	-	-	2.0E-05	1.34%	1.2E-06	1.37%	-	-
Uranium-238	1.6E-06	39.01%	7.1E-04	48.33%	4.3E-05	49.53%	3.0E-05	39.23%
Homegrown Produce (Groundwater Affected)								
Uranium-234	N/A		1.1E-04	7.55%	6.1E-06	7.07%	7.8E-06	10.09%
Uranium-235/236								
Uranium-238	N/A		2.1E-04	14.57%	1.2E-05	13.63%	1.5E-05	19.46%
Beef/Milk (Dust Affected):								
Dibenzo(a,h)anthracene	-	-	1.7E-6	0.12%	-	-	1.06E-06	1.29%
Beef/Milk (Groundwater Affected):								
Uranium-234	-	-	1.1E-05	0.74%	-	-	2.0E-06	2.54%
Uranium-238	-	-	2.1E-05	1.42%	-	-	3.8E-06	4.90%
Ambient Radon	-	-	4.2E-06	5.48%	-	-	-	-

[a]Sediment, surface water, home grown produce (dust and groundwater affected), and beef/milk (dust affected) pathways do not have any COCs associated with them, therefore, were not included in this table.
[b]Great Miami River User (Adult) and Great Miami River (Youth) receptors did not have any COCs associated with them, therefore, were not included in this table.
[c]No risk greater than the threshold level of 1×10^{-6}.
[d]N/A signifies that exposure of the receptor to the indicated medium is not applicable.
[e]The Off-Propery farmer under both federal and private ownership has the same risk.
[f]The Off-Property child under both federal and private ownership has the same risk.

000485

0004466

TABLE B.4-6b

INACTIVE FLYASH PILE
FUTURE LAND USE
SUMMARY OF COC NONCARCINOGENIC HAZARD CONTRIBUTIONS[a]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	Off-Property Resident Farmer	% Total Receptor Risk	Off-Property Resident Child	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk
Groundwater:								
Uranium-Total	N/A[b]		9.1E-01	76.82%	2.1E+00	84.37%	1.8E+01	82.33%
Home Grown Produce (Groundwater Affected):								
Uranium-Total	N/A		2.6E-01	21.89%	2.4E-01	9.54%	3.3E+00	15.34%
Beef/Milk (Groundwater Affected):								
Uranium-Total	N/A		-[c]	-	-	-	4.9E-01	2.28%

See footnotes at end of table

TABLE B.4-6b
(Continued)

Medium/ Parameter	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk
Groundwater:				
Uranium-Total	8.2E+00	84.05%	4.1E+01	62.59%
Home Grown Produce (Groundwater Affected):				
Uranium-Total	1.4E+00	14.10%	1.9E+01	29.85%
Beef/Milk (Groundwater Affected):				
Uranium-Total	-	-	-	-

[a]Soil, sediment, surface water, home grown produce (dust affected), and beef/milk (dust affected) pathways do not have any COCs associated with them, therefore, were not included in this table.

[b]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

[c]No hazard greater than the threshold level of 0.2.

0004827

6502

B.4.1.4 Solid Waste Landfill

The Solid Waste Landfill has two current receptors that have at least one COC, the trespassing youth and the groundskeeper. The current receptors and COCs for the Solid Waste Landfill are listed in Tables B.4-7a and B.4-7b. The groundskeeper has the highest current risk for the Solid Waste Landfill ($3.4x10^{-5}$). Ninety five percent of the groundskeeper's risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in surface soil, the remainder is due to dermal contact with surface soil. The trespassing youth has the next highest current risk ($1.5x10^{-5}$) and the only hazard greater than one (HI of 8.6 due to dermal contact with Uranium-Total in surface water). Fifty-eight percent of the total trespassing youth risk is due predominantly to external radiation from radium-226, thorium-228, and thorium-232 in surface soil, another 30 percent is due to dermal contact with arsenic in surface water.

The Solid Waste Landfill has seven future receptors that have associated COCs. The future receptors and COCs for the Solid Waste Landfill are listed in Tables B.4-8a and B.4-8b. The RME on-property farmer has the highest ILCR of all Solid Waste Landfill receptors ($2.8x10^{-3}$ total risk) due predominantly to inhalation, external radiation and dermal contact with surface soil (64 percent of total) containing radium-226, radium-228, thorium-228, thorium-232, and uranium-238, and ingestion of soil effected beef/milk (32 percent of total risk) containing benzo(a)pyrene and dibenzo(a,h)anthracene. The RME farmer does not have a total HI of greater than one. The perched groundwater user is exposed to the same pathways as the RME farmer, with the addition of perched groundwater. The total ILCR for the perched groundwater user is the same as the RME farmer because the perched groundwater contribution is $7.0x10^{-6}$, 0.3 percent of the total receptor risk.

The on-property child has a total ILCR of $6.4x10^{-4}$ due to inhalation, external radiation of radium-226, thorium-228, thorium-232, and dermal contact with surface soil (25 percent of total), ingestion of soil effected beef/milk (71 percent of total) containing benzo(a)pyrene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. The on-property child has the only HI greater than or equal to 1.0 in the Solid Waste Landfill (1.0) due to dermal contact with arsenic in the surface soil (28 percent), ingestion of surface soil effected vegetables and fruit (36 percent from arsenic), and ingestion of surface soil effected beef/milk (34 percent from arsenic). The CT on-property farmer has a total ILCR of $2.0x10^{-4}$ due to external radiation from radium-226, radium-228, thorium-228, thorium-232 in surface soil (74 percent of total), and ingestion of soil effected beef/milk (22 percent of total)

000448

TABLE B.4-7a

SOLID WASTE LANDFILL
CURRENT LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Receptor Risk	Groundskeeper	% Total Receptor Risk
Soil:				
Radium-228	1.8E-06	12.31%	6.9E-06	20.21%
Radium-228	1.0E-06	7.10%	3.9E-06	11.60%
Thorium-228	2.0E-06	13.30%	7.3E-06	21.69%
Thorium-228	2.7E-06	18.71%	1.0E-05	30.54%
Uranium-238	-[c]	-	2.5E-06	7.78%
Surface Water:				
Arsenic	4.4E-06	29.77%	N/A[d]	

[a]Off-Property Resident Farmer and Child, and User of Milk and Meat receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]Sediment, home grown produce (dust and surface water affected), and beef/milk 9dust and surface water affected) pathways do not have any COCs associated with them, therefore, were not included in this table.

[c]No risk greater than the threshold level of 1 x 10-6.

[d]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

000449

0004850

TABLE B.4-7b

SOLID WASTE LANDFILL
CURRENT LAND USE
SUMMARY OF COC NONCARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Receptor Risk
Soil: Uranium-Total	8.2E+00	96.33%
Sediment: Uranium-Total	2.6E-01	3.00%

[a]Off-Property Resident Farmer and Child, and User of Milk and Meat receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]Soil, surface water, home grown produce (dust and surface water affected), and beef/milk (dust and surface water affected) pathways do not have any COCs associated with them, therefore, were not included in this table.

TABLE B.4-8a
SOLID WASTE LANDFILL FUTURE LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	Great Miami River User	% Total Receptor Risk
Soil:								
Neptunium-237	-	-	2.3E-05	0.082%	1.9E-06	0.95%	N/A	
Plutonium-238	-	-	1.1E-06	0.04%	-	-	N/A	
Radium-226	3.8E-06	18.96%	3.5E-04	12.91%	2.9E-05	15.03%	N/A	
Radium-228	2.2E-06	10.92%	2.0E-04	7.41%	1.7E-05	8.66%	N/A	
Thorium-228	4.1E-06	20.43%	3.8E-04	13.89%	3.2E-05	16.40%	N/A	
Thorium-230	-	-	2.4E-6	0.09%	-	-	N/A	
Thorium-232	5.8E-06	28.74%	5.4E-04	19.33%	4.5E-05	22.86%	N/A	
Uranium-234	-	-	1.5E-05	0.53%	1.0E-6	0.57%	N/A	
Uranium-235/236	-	-	2.9E-05	1.05%	2.4E-06	1.24%	N/A	
Uranium-238	1.4E-06	6.76%	1.7E-04	6.03%	1.3E-05	6.76%	N/A	
Arsenic	-	-	3.0E-05	1.09%	1.9E-6	0.73%	N/A	
Benzo(a)anthracene	-	-	1.3E-6	0.05%	-	-	N/A	
Beryllium	-	-	1.5E-5	0.53%	-	-	N/A	
Benzo(b)-fluoranthene	-	-	2.6E-6	0.09%	-	-	N/A	
Dibenzo(a,h)-anthracene	-	-	7.2E-6	0.26%	-	-	N/A	
Indeno(1,2,3-cd)pyrene	-	-	1.7E-6	0.06%	-	-	N/A	
Perched Groundwater:								
Technetium-99	N/A		N/A		N/A		N/A	
Carbazole	N/A		N/A		N/A		N/A	

See footnotes at end of table

000852

TABLE B.4-8a
(Continued)

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	Great. Miami River User	% Total Receptor Risk
Home Grown Produce (Dust Affected):								
Neptunium-237	N/A		3.4E-06	0.12%	-	-	N/A	
Radium-226	N/A		2.1E-06	0.08%	-	-	N/A	
Strontium-90	N/A		1.1E-05	0.40%	-	-	N/A	
Uranium-234	N/A		3.5E-06	0.13%	-	-	N/A	
Uranium-238	N/A		1.1E-05	0.40%	-	-	N/A	
Arsenic	N/A		5.1E-06	1.82%	2.8E-06	1.42%	N/A	
Benzo(a)anthracene	N/A		4.0E-06	0.14%	-	-	N/A	
Benzo(a)pyrene	N/A		2.1E-05	0.74%	1.1E-06	0.58%	N/A	
Benzo(b)fluoranthene	N/A		4.2E-06	0.15%	-	-	N/A	
Beryllium	N/A		3.3E-06	0.12%	-	-	N/A	
Dibenzo(a,h)anthracene	N/A		4.5E-06	0.17%	-	-	N/A	
Indeno(1,2,3-cd)pyrene	N/A		1.5E-06	0.06%	-	-	N/A	
Beef/Milk (Dust Affected):								
Radium-226	N/A		-	-	-	-	N/A	
Strontium-90	N/A		5.0E-05	1.80%	2.3E-06	1.16%	N/A	
Uranium-234	N/A		-	-	-	-	N/A	
Uranium-238	N/A		9.6E-06	0.34%	-	-	N/A	
Arsenic	N/A		6.7E-05	2.42%	3.8E-06	1.94%	N/A	
Benzo(a)anthracene	N/A		1.1E-05	0.39%	-	-	N/A	
Benzo(a)pyrene	N/A		2.0E-04	7.04%	9.9E-06	5.03%	N/A	
Benzo(b)fluoranthene	N/A		4.2E-05	1.51%	2.1E-06	1.08%	N/A	
Beryllium	N/A		-	-	-	-	N/A	
Dibenzo(a,h)anthracene	N/A		4.2E-04	15.17%	2.1E-05	10.85%	N/A	
Indeno(1,2,3-cd)pyrene	N/A		6.2E-05	2.24%	3.1E-06	1.61%	N/A	
Ambient Radon	-	-	1.4E-06	0.05%	-	-	N/A	

See footnotes at end of table

TABLE B.4-8a
(Continued)

Medium/ Parameter	On-Property Resident Child	% Total Receptor Risk	Home-builder	% Total Receptor Risk	Perched Groundwater user	% Total Receptor Risk	Perched Groundwater Child	% Total Receptor Risk
Soil:								
Neptunium-237	1.7E-06	0.27%	-	-	2.3E-05	0.083%	N/A	
Plutonium-238	-	-	-	-	1.1E-6	0.04%	N/A	
Radium-226	2.7E-05	4.18%	-	-	3.5E-04	12.73%	N/A	
Radium-228	1.5E-05	2.39%	-	-	2.0E-04	7.30%	N/A	
Thorium-228	2.9E-05	4.48%	1.1E-06	12.25%	3.8E-04	13.70%	N/A	
Thorium-230	-	-	-	-	-	-	N/A	
Thorium-232	4.0E-05	6.30%	1.8E-06	19.83%	5.4E-04	19.28%	N/A	
Uranium-234	-	-	-	-	1.5E-5	0.52%	N/A	
Uranium-235/236	2.2E-06	0.34%	-	-	2.9E-05	1.05%	N/A	
Uranium-238	1.0E-05	1.62%	-	-	1.7E-04	6.02%	N/A	
Arsenic	1.3E-05	2.04%	-	-	3.0E-05	1.09	N/A	
Benzo(a)anthracene	-	-	-	-	1.3E-6	0.05%	N/A	
Benzo(b)-fluoranthene	1.1E-6	0.18%	-	-	2.6E-6	0.09%	N/A	
Beryllium	6.6E-06	1.03%	-	-	1.5E-5	0.53%	N/A	
Benzo(a)pyrene	5.4E-06	0.86%	2.7E-06	30.05%	1.2E-5	0.44%	N/A	
Dibenzo(a,h)-anthracene	3.2E-06	0.50%	-	-	9.2E-6	0.26%	N/A	
Indeno(1,2,3-cd)pyrene	-	-	-	-	1.7E-6	0.06%	N/A	
Perched Groundwater:								
Technetium-99	N/A		N/A		1.8E-06	0.07%	N/A	
Carbazole	N/A		N/A		5.3E-03	0.19%	N/A	
Home Grown Produce (Dust Affected):								
Neptunium-237	-	-	N/A		3.4E-06	0.12%	N/A	
Radium-226	-	-	N/A		2.1E-06	0.08%	N/A	
Strontium-90	-	-	N/A		1.1E-05	0.40%	N/A	
Uranium-234	-	-	N/A		3.5E-06	0.13%	N/A	
Uranium-238	-	-	N/A		1.1E-05	0.40%	N/A	
Arsenic	1.7E-05	2.61%	N/A		5.1E-5	1.82%	N/A	
Benzo(a)anthracene	1.3E-06	0.21%	N/A		4.0E-6	0.14%	N/A	
Benzo(a)pyrene	6.8E-06	1.06%	N/A		2.1E-5	0.74%	N/A	
Benzo(b)fluoranthene	1.4E-06	0.22%	N/A		4.2E-6	0.15%	N/A	

See footnotes at end of table

TABLE B.4-8a
(Continued)

Medium/ Parameter	On-Property Resident Child	% Total Receptor Risk	Home-builder	% Total Receptor Risk	Perched Groundwater user	% Total Receptor Risk	Perched Groundwater Child	% Total Receptor Risk
Beryllium	1.1E-06	0.17%	N/A		3.3E-6	0.12%	N/A	
Dibenzo(a,h)anthracene	1.5E-06	0.23%	N/A		4.5E-6	0.16%	N/A	
Indeno(1,2,3-cd)pyrene	-	-	N/A		1.5E-6	0.06%	N/A	
Beef/Milk (Dust Affected):								
Radium-226	-	-	N/A		5.1E-6	0.18%	N/A	
Strontium-90	9.3E-06	1.46%	N/A		5.0E-05	1.79%	N/A	
Uranium-234	-	-	N/A		-	-	N/A	
Uranium-238	-	-	N/A		9.6E-06	0.34%	N/A	
Arsenic	1.6E-05	2.48%	N/A		6.7E-05	2.42%	N/A	
Benzo(a)anthracene	6.3E-06	0.98%	N/A		1.1E-05	0.39%	N/A	
Benzo(a)pyrene	1.1E-04	17.63%	N/A		2.0E-04	7.02%	N/A	
Benzo(b)fluoranthene	2.4E-05	3.80%	N/A		4.2E-05	1.51%	N/A	
Beryllium	-	-	N/A		3.1E-6	0.11%	N/A	
Dibenzo(a,h)anthracene	2.4E-04	37.99%	N/A		4.2E-04	15.13%	N/A	
ndeno(1,2,3-cd)pyrene	3.6E-05	5.62%	N/A		6.2E-05	2.24%	N/A	
Ambient Radon	-	-	N/A		1.4E-06	0.05%	N/A	

[a]Off-Property Resident Farmer and Child receptors did not have any COCs associated with them, therefore, were not included in this table.

[b]Sediment, groundwater, surface water, home grown produce (groundwater affected), perched groundwater, beef/milk (groundwater and surface water affected) pathways did not have any COCs associated with them, therefore, were not included in this table.

[c]No risk greater than the threshold level of 1×10^{-6}.

[d]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

TABLE B.4-8b

SOLID WASTE LANDFILL
FUTURE LAND USE
SUMMARY OF COC TOTAL NONCARCINOGENIC HAZARD CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk	Home-Builder	% Total Receptor Risk
Sediment: Uranium-Total	2.6E-01	93.48%	N/A		N/A		N/A		N/A	
Beef/Milk (Dust Affected): Arsenic	N/A		-	-	-	-	3.5E-01	34.14%	N/A	

[a]Off-Property Resident Farmer and Child receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]Soil, groundwater, surface water, home grown produce (dust and groundwater affected), beef/milk (dust and groundwater affected), pathways do not have any COCs associated with them, therefore, were not included in this table.

[c]No hazard greater than the threshold level of 0.2.

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containing benzo(a)pyrene, and dibenzo(a,h)anthracene. The CT on-property farmer has an HI of less than 1.0.

The expanded trespasser has a total ILCR of $2.0x10^{-5}$ due to external radiation from radium-226, radium-228, thorium-228, thorium-232, and uranium-238 in surface soil (93 percent of total). The expanded trespasser did not have an HI of greater than 1.0. The off-property farmer (private ownership) has a total ILCR of $1.2x10^{-6}$ due predominantly to the inhalation of U-234 and U-238 radionuclides in air (87 percent of total risk). The off-property farmer (private ownership) HI is less than 1.0. The on-property homebuilder receives an ILCR of $9.0x10^{-6}$ due to external radiation and dermal contact with subsurface soils containing predominantly radium-226, thorium-228, thorium-232, uranium-238, arsenic, and benzo(a)pyrene. The homebuilder does not receive an HI greater than 1.0.

B.4.1.5 Lime Sludge Ponds

The Lime Sludge Ponds have two current receptors that have at least one COC, the trespassing youth and the groundskeeper. The current receptors and COCs for the Lime Sludge Ponds are listed in Table B.4-9a and B.4-9b. The groundskeeper has the highest current risk for the Lime Sludge Ponds ($4.5x10^{-5}$). One hundred percent of the groundskeeper's risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, and thorium-232, and uranium-238 in surface soil. The trespassing youth has the next highest current risk ($1.1x10^{-5}$). One hundred percent of the total trespassing youth risk is due predominantly to external radiation from radium-226, radium-228, thorium-228, and thorium-232 in surface soil. No current receptor has an HI greater than 1.0.

The Lime Sludge Ponds have three future receptors that have associated COCs. The future receptors and COCs for the Lime Sludge Ponds are listed in Tables B.4-10a and B.4-10b. The RME on-property farmer has the highest ILCR of all Lime Sludge Ponds receptors ($1.2x10^{-5}$ total risk) due predominantly to inhalation of surface soil (79 percent of total) containing thorium-230 and uranium-238, and ingestion of dust effected beef/milk (10 percent of total risk). The RME farmer has a total HI of less than 1.0. The perched groundwater user has the same exposure as the RME farmer, with the addition of perched groundwater. The total ILCR for the perched groundwater user is $7.7x10^{-5}$ due to ingestion of perched groundwater (83 percent of total risk) containing neptunium-237, strontium-90, and technetium-99, the remainder is inhalation of surface soil (16 percent of total risk). The perched groundwater user has an HI of less than one. The expanded trespasser has a total ILCR

TABLE B.4-9a

LIME SLUDGE PONDS
CURRENT LAND USE
SUMMARY OF COC CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Medium Risk	% Total Receptor Risk	Groundskeeper	% Total Medium Risk	% Total Receptor Risk
Soil:						
Cesium-137	-[c]		-	1.1E-06		2.52%
Radium-226	2.5E-06		21.73%	9.3E-06		20.94%
Radium-228	1.0E-06		8.92%	3.8E-06		8.55%
Thorium-228	3.5E-06		30.63%	1.3E-05		29.45%
Thorium-230	-		-	-		-
Thorium-232	2.41E-6		20.94%	9.0E-06		20.13%
Uranium-238	-		-	3.9E-06		8.79%
Beef/Milk (Dust Affected):						
Aroclor-1254	N/A[d]					
Benzo(a)pyrene	N/A					

[a]Off-Property Resident Farmer and Off-Property Resident Child receptors did not have any COCs associated with them, therefore, are not included in this table.

[b]Groundwater, surface water, homegrown produce (dust and groundwater affected), beef/milk (groundwater affected) pathways did not have any COCs associated with them, therefore, were not included in this table.

[c]No risk greater than the threshold level of 1×10^{-6}.

[d]N/A signifies that exposure of the receptor to the indicated medium is not applicable.

See footnotes at end of table

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TABLE B.4-9b

LIME SLUDGE PONDS
CURRENT LAND USE
SUMMARY OF COC NONCARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Trespassing Youth	% Total Receptor Risk
Soil: Uranium-Total	2.0E-1	97.06%
Home Grown Produce (Dust Affected):	N/A[c]	
Beef/Milk (Dust Affected):	N/A	

[a]Off-Property Resident Farmer and Child, and User of Milk and Meat receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]Sediment and surface water pathways do not have any COCs associated with them, therefore, were not included in this table.

[c]N/A signifies that exposure of the receptor for the indicated medium is not applicable.

TABLE B.4-10a

LIME SLUDGE PONDS
FUTURE LAND USE
SUMMARY OF COC TOTAL CARCINOGENIC RISK CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	Off-Property Resident Farmer	% Total Receptor Risk
Soil:			-	-
Cesium-137	-[c]	-	-	-
Radium-226	5.2E-06	21.66	-	-
Radium-228	2.1E-06	8.88%	-	-
Thorium-228	7.3E-06	30.44%	-	-
Thorium-230	-	-	-	-
Thorium-232	5.0E-06	20.81%	-	-
Uranium-238	1.5E-06	6.37%	-	-
			-	-

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See footnote at end of table

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TABLE B.4-10a
(Continued)

Medium/ Parameter	Off-Property Resident Child	% Total Receptor Risk	On-Property Resident Farmer (RME)	% Total Receptor Risk	On-Property Resident Farmer (CT)	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk	Perched Groundwater User Adult	% Total Receptor Risk
Soil:	-	-								
Cesium-137	-	-	-	-	-	-	-	-	-	-
Radium-226	-	-	-	-	-	-	-	-	-	-
Radium-228	-	-	-	-	-	-	-	-	-	-
Thorium-228	-	-	-	-	-	-	-	-	-	-
Thorium-230	-	-	2.3E-06	16.94%	-	-	-	-	2.3E-06	2.93%
Thorium-232	-	-	-	-	-	-	-	-	-	-
Uranium-238	-	-	6.4E-06	48.39%	-	-	-	-	6.4E-06	8.38%
Perched Groundwater:										
Neptunium-237	-	-	-	-	-	-	-	-	5.5E-05	70.84%
Strontium-90	-	-	-	-	-	-	-	-	3.4E-06	4.38%
Technetium-99	-	-	-	-	-	-	-	-	5.2E-06	6.81%

[a]Perched Groundwater User, Off-property Resident Child, and Perched Groundwater Child receptors do not have any COCs and are not included in this table.

[b]Sediment, groundwater, surface water, perched groundwater, home grown produce (dust and groundwater affected), and beef/milk (dust and groundwater affected) pathways do not have any COCs associated with them, therefore, not included in this table.

[c]No risk greater than the threshold level of 1×10^{-6}.

See footnote at end of table

TABLE B.4-10b

LIME SLUDGE PONDS
FUTURE LAND USE
SUMMARY OF COC TOTAL NONCARCINOGENIC HAZARD CONTRIBUTIONS[a,b]
OPERABLE UNIT 2 REMEDIAL INVESTIGATION
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Medium/ Parameter	Expanded Trespasser	% Total Receptor Risk	On-Property Resident Child	% Total Receptor Risk
Soil:				
Uranium-Total	2.1E-01	97.34%	N/D[c]	

[a]Off-Property and On-Property Resident Farmer and Off-Property Resident Child receptors do not have any COCs associated with them, therefore, were not included in this table.

[b]Sediment, groundwater, surface water, home grown produce (dust affected), and beef/milk (dust and groundwater affected) pathways and groundwater do not have any COCs associated with them, therefore, were not included in this table.

[c]N/D - not determined because toxicity data not available.

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of $2.4x10^{-5}$ due to external radiation from radium-226, radium-228, thorium-228, thorium-232, and uranium-238. The expanded trespasser did not have an HI of greater than 1.0.

B.4.1.6 Operable Unit 2 Wide

The Operable Unit 2 Wide assessment considers three future receptors, the expanded trespasser, off-property resident farmer (private ownership), and on-property RME farmer. The Operable Unit 2 Wide expanded trespasser differs from the individual subunit expanded trespasser in that he is considered to wander between all of the subunits. An area weighted average approach was used to establish his exposures. The on-property RME farmer is considered to live on the South Field. The only additional exposure that the Operable Unit 2 Wide RME farmer gets above the South Field RME farmer are cumulative air and groundwater concentrations from all five subunits. The off-property farmer also receives an exposure to the cumulative air and groundwater concentrations.

The RME on-property farmer has the highest ILCR for the Operable Unit 2 Wide assessment ($3.3x10^{-2}$ total risk) due predominantly to external radiation from radium-226, thorium-228, and thorium-232 in surface soil (33 percent of total), and ingestion of dust effected beef/milk (58 percent of total risk) containing technetium-99, benzo(a)pyrene, and dibenzo(a,h)anthracene. The RME farmer has a total HI of 23 from ingestion of groundwater and groundwater effected produce containing Uranium-Total. The expanded trespasser has a total ILCR of $8.7x10^{-5}$ due predominantly to external radiation from radium-226, radium-228, thorium-228, thorium-232, and external radiation from radium-226 in sediment. The expanded trespasser did not have an HI of greater than 1.0.

The off-property farmer (private ownership) has an ILCR of $1.1x10^{-5}$ due predominantly to ingestion of groundwater (53 percent of total risk) containing uranium-234 and uranium-238, and inhalation of dust (11 percent of total risk) containing radium-226 and uranium-238, dust effected produce (13 percent of total risk) containing radium-226, and dust effected beef/milk (12 percent of total risk) containing radium-226, benzo(a)pyrene, and dibenzo(a,h)anthracene. The off-property farmer has a total HI of 3.7 due predominantly to ingestion of groundwater and groundwater effected produce containing Uranium-Total.

B.4.2 RISKS FROM NATURAL BACKGROUND

All subunit-specific risks in the risk assessment are calculated without subtracting the contribution from natural background. In some areas in Operable Unit 2, the concentrations of CPCs are only

slightly above naturally occurring background levels. Therefore, it is informative to calculate the risks from substituting background concentrations in place of Operable Unit 2 contaminant levels to provide a point of comparison for the subunit-specific risks.

Risks and HIs are calculated by replacing background concentrations for Operable Unit 2 CPCs existing at each subunit. The same exposure pathways quantitatively evaluated for the RME on-property resident farmer are evaluated. Exposure point concentrations dependent on the results of air and groundwater modeling were derived assuming background soil concentrations for the source terms in both groundwater and air modeling. Other exposure parameter values used for calculating background intakes are also the same as those used for evaluating subunit-specific risks to the RME on-property resident farmer.

Tables B.4-11(a), B.4-11(b), B.4-11(c), and B.4-11(d) (Attachment III) present the background risks and HIs for the Active Flyash Pile future on-property RME farmer due to background levels of CPCs in surface flyash material, groundwater, homegrown produce, and beef and milk, respectively. Tables B.4-12(a) and B.4-12(b) compare the total Active Flyash Pile specific carcinogenic risk and noncarcinogenic HIs for the future on-property RME farmer to the risks and hazards that can be attributed to naturally occurring levels of CPCs.

Table B.4-12(a) illustrates that the total risk to this receptor assuming background concentrations of CPCs would be 1.1×10^{-5}. This can be viewed as a "floor" against which to compare the Active Flyash Pile specific calculated risk of 8.2×10^{-5}. Review of Table B.4-12(a) also indicates that each Active Flyash Pile pathway's risk is about one order of magnitude higher than background risks, meaning that the Active Flyash Pile source impacts all media equally. Groundwater is the significant pathway for both the Active Flyash Pile and background, contributing 96 percent of the total risk for both. A comparison of the total risks indicates that the presence of the Active Flyash Pile causes a seven fold increase in the equivalent background risk determined by the same risk assessment methodology.

Tables B.4-12(b) illustrates that the total HI hazard to this receptor assuming background concentrations of CPCs would be 0.14. This can be viewed as a "floor" against which to compare the Active Flyash Pile specific calculated HI of 1.0. Review of Table B.4-12(b) also indicates that the same influences impacting risks are impacting the HI. The total HI for the Active Flyash Pile is

TABLE B.4-12(a)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
ACTIVE FLYASH PILE: CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	CS-137	1.5E-11	0.00%	0.00%	6.8E-12	0.00%	0.00%
	NP-237	1.4E-07	8.01%	0.17%	0.0E+00	0.00%	0.00%
	PU-238	2.4E-08	1.37%	0.03%	0.0E+00	0.00%	0.00%
	PU-239/240	1.1E-08	0.63%	0.01%	0.0E+00	0.00%	0.00%
	RA-226	2.8E-08	1.62%	0.03%	7.5E-09	2.18%	0.07%
	RA-228	1.9E-09	0.11%	0.00%	6.8E-10	0.20%	0.01%
	SR-90	2.4E-10	0.01%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	2.6E-07	14.87%	0.31%	7.6E-08	22.08%	0.66%
	TH-230	9.0E-08	5.18%	0.11%	3.8E-08	10.96%	0.33%
	TH-232	2.6E-07	14.94%	0.32%	1.0E-07	30.03%	0.90%
	U-234	8.1E-08	4.70%	0.10%	2.3E-08	6.82%	0.20%
	U-235/236	3.5E-09	0.20%	0.00%	1.9E-09	0.56%	0.02%
	U-238	1.6E-07	9.39%	0.20%	4.9E-08	14.18%	0.42%
	Total Radiological Risk	1.1E-06	61.04%	1.29%	3.0E-07	87.00%	2.60%
	Arsenic	6.6E-07	37.82%	0.80%	4.2E-08	12.28%	0.37%
	Beryllium	1.9E-08	1.11%	0.02%	2.4E-09	0.71%	0.02%
	Benzo(a)anthracene	3.3E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	3.6E-10	0.02%	0.00%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	5.3E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	6.7E-07	38.96%	0.82%	4.5E-08	13.00%	0.39%
	Total	1.7E-06	100.00%	2.11%	3.4E-07	100.00%	2.99%
Groundwater	NP-237	3.4E-09	0.01%	0.00%	0.0E+00	0.00%	0.00%
	SR-90	9.6E-07	2.04%	1.18%	2.6E-07	3.24%	2.30%
	U-234	1.6E-05	32.87%	18.91%	2.8E-06	34.01%	24.16%
	U-235/236	8.2E-07	1.74%	1.00%	2.5E-07	3.06%	2.18%
	U-238	3.0E-05	63.34%	36.44%	4.9E-06	59.68%	42.39%
	Total Radiological Risk	4.7E-05	100.00%	57.54%	8.2E-06	100.00%	71.03%
	Arsenic	8.8E-15	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	4.3E-16	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	9.3E-15	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	4.7E-05	100.00%	57.54%	8.2E-06	100.00%	71.03%
Homegrown Produce (Dust Affected)	CS-137	4.0E-10	0.03%	0.00%	1.8E-10	0.16%	0.00%
	NP-237	1.4E-08	0.96%	0.02%	0.0E+00	0.00%	0.00%
	PU-238	1.7E-09	0.12%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	8.4E-10	0.06%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	4.1E-08	2.89%	0.05%	1.1E-08	9.91%	0.09%
	RA-228	3.5E-09	0.25%	0.00%	1.3E-09	1.15%	0.01%
	SR-90	2.0E-09	0.14%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	2.3E-09	0.16%	0.00%	6.7E-10	0.61%	0.01%
	TH-230	5.2E-10	0.04%	0.00%	2.2E-10	0.20%	0.00%
	TH-232	5.2E-09	0.37%	0.01%	2.1E-09	1.88%	0.02%
	U-234	6.4E-10	0.05%	0.00%	1.8E-10	0.17%	0.00%
	U-235/236	2.8E-11	0.00%	0.00%	1.6E-11	0.01%	0.00%
	U-238	1.1E-09	0.08%	0.00%	3.3E-10	0.30%	0.00%
	Total Radiological Risk	7.3E-08	5.15%	0.09%	1.6E-08	14.40%	0.14%
	Arsenic	1.2E-06	84.85%	1.46%	7.7E-08	70.07%	0.67%
	Beryllium	1.3E-07	9.51%	0.16%	1.7E-08	15.54%	0.15%
	Benzo(a)anthracene	5.3E-10	0.04%	0.00%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	5.6E-09	0.40%	0.01%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	8.4E-10	0.06%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.3E-06	94.85%	1.63%	9.4E-08	85.60%	0.82%
	Total	1.4E-06	100.00%	1.72%	1.1E-07	100.00%	0.96%

TABLE B.4-12(a)
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Homegrown	NP-237	1.0E-09	0.00%	0.00%	0.0E+00	*0.00%*	*0.00%*
Produce	RA-226	6.5E-06	27.16%	7.95%	0.0E+00	*0.00%*	*0.00%*
(Groundwater	SR-90	1.2E-05	50.36%	14.74%	9.2E-08	*3.57%*	*0.80%*
Affected)	U-234	2.5E-07	1.03%	0.30%	8.4E-07	*32.60%*	*7.28%*
	U-235/236	5.2E-06	21.44%	6.28%	7.5E-08	*2.94%*	*0.66%*
	U-238	0.0E+00	0.00%	0.00%	1.5E-06	*57.22%*	*12.78%*
	Total Radiological Risk	2.4E-05	100.00%	29.27%	2.5E-06	*96.34%*	*21.51%*
	Arsenic	3.4E-15	0.00%	0.00%	*7.7E-08*	*3.00%*	*0.67%*
	Beryllium	7.0E-17	0.00%	0.00%	*1.7E-08*	*0.66%*	*0.15%*
	Total Chemical Risk	3.5E-15	0.00%	0.00%	*9.4E-08*	*3.66%*	*0.00%*
	Total	2.4E-05	100.00%	29.27%	*2.6E-06*	*100.00%*	*21.51%*
Beef/Milk	CS-137	1.9E-09	0.41%	0.00%	8.7E-10	2.72%	0.01%
(Dust	NP-237	6.1E-11	0.01%	0.00%	0.0E+00	0.00%	0.00%
Affected)	PU-238	9.7E-14	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	5.1E-14	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	7.2E-09	1.54%	0.01%	1.9E-09	6.08%	0.02%
	RA-228	4.1E-10	0.09%	0.00%	1.5E-10	0.46%	0.00%
	SR-90	1.6E-09	0.34%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	3.1E-12	0.00%	0.00%	9.1E-13	0.00%	0.00%
	TH-230	3.3E-12	0.00%	0.00%	1.4E-12	0.00%	0.00%
	TH-232	3.3E-11	0.01%	0.00%	1.3E-11	0.04%	0.00%
	U-234	8.9E-11	0.02%	0.00%	2.6E-11	0.08%	0.00%
	U-235/236	4.0E-12	0.00%	0.00%	2.2E-12	0.01%	0.00%
	U-238	1.6E-10	0.03%	0.00%	4.7E-11	0.15%	0.00%
	Total Radiological Risk	1.2E-08	2.45%	0.01%	3.0E-09	9.55%	0.02%
	Arsenic	4.2E-07	88.55%	0.51%	2.7E-08	84.30%	0.23%
	Beryllium	1.5E-08	3.26%	0.02%	2.0E-09	6.15%	0.02%
	Benzo(a)anthracene	7.9E-10	0.17%	0.00%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	2.3E-08	4.83%	0.03%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	3.5E-09	0.74%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	4.6E-07	97.55%	0.56%	2.9E-08	90.45%	0.25%
	Total	4.7E-07	100.00%	0.57%	3.2E-08	100.00%	0.27%
Beef/Milk	NP-237	3.1E-12	0.00%	0.00%	0.0E+00	0.00%	0.00%
(Groundwater	RA-226	6.5E-07	9.06%	0.80%	0.0E+00	0.00%	0.00%
Affected)	SR-90	6.0E-06	83.65%	7.35%	4.6E-08	0.56%	0.40%
	U-234	2.4E-08	0.33%	0.03%	8.1E-08	1.00%	0.71%
	U-235/236	5.0E-07	6.95%	0.61%	7.3E-09	0.09%	0.06%
	U-238	0.0E+00	0.00%	0.00%	1.4E-07	1.75%	1.24%
	Total Radiological Risk	7.2E-06	100.00%	8.79%	2.8E-07	3.40%	2.41%
	Arsenic	6.3E-16	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	3.7E-18	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	6.3E-16	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	7.2E-06	100.00%	8.79%	2.8E-07	3.40%	0.00%
ALL MEDIA		8.2E-05			1.1E-05		

TABLE B.4-12(b)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
ACTIVE FLYASH PILE: NON-CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	N/A						
Groundwater	Arsenic	1.7E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	1.3E-14	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-Total	7.5E-01	100.00%	75.14%	1.0E-01	100.00%	74.96%
	Total Chemical Risk	7.5E-01	100.00%	75.14%	1.0E-01	100.00%	74.96%
	Total	7.5E-01	100.00%	75.14%	1.0E-01	100.00%	74.96%
Homegrown Produce (Dust Affected)	Arsenic	2.3E-03	89.62%	0.23%	1.5E-04	72.38%	0.11%
	Beryllium	6.2E-06	0.25%	0.00%	8.0E-07	0.39%	0.00%
	Thallium	2.6E-04	10.13%	0.03%	5.5E-05	27.23%	0.04%
	Total Chemical Risk	2.5E-03	99.75%	0.25%	2.0E-04	99.61%	0.15%
	Total	2.5E-03	99.75%	0.25%	2.0E-04	99.61%	0.15%
Homegrown Produce (Groundwater Affected)	Arsenic	6.5E-12	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	3.3E-15	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-Total	2.1E-01	100.00%	21.41%	2.9E-02	100.00%	21.36%
	Total Chemical Risk	2.1E-01	100.00%	21.41%	2.9E-02	100.00%	21.36%
	Total	2.1E-01	100.00%	21.41%	2.9E-02	100.00%	21.36%
Beef/Milk (Dust Affected)	Arsenic	7.9E-04	21.63%	0.08%	5.1E-05	7.66%	0.04%
	Beryllium	7.1E-07	0.02%	0.00%	9.1E-08	0.01%	0.00%
	Thallium	2.9E-03	78.35%	0.29%	6.2E-04	92.33%	0.45%
	Total Chemical Risk	3.7E-03	100.00%	0.37%	6.7E-04	100.00%	0.48%
	Total	3.7E-03	100.00%	0.37%	6.7E-04	100.00%	0.48%
Beef/Milk (Groundwater Affected)	Arsenic	1.2E-12	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	1.7E-16	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-Total	2.1E-02	100.00%	2.09%	2.9E-03	100.00%	2.08%
	Total Chemical Risk	2.1E-02	100.00%	2.09%	2.9E-03	100.00%	2.08%
	Total	2.1E-02	100.00%	2.09%	2.9E-03	100.00%	2.08%
ALL MEDIA		1.0E+00			1.4E-01		

seven times greater than the equivalent risk due to background, and the primary receptor is groundwater.

Tables B.4-13(a) B.4-13(b), B.4-13(c), and B.4-13(d) (Attachment III) present the background risks and HIs for the South Field future on-property RME farmer due to background levels of CPCs in surface soil, groundwater, homegrown produce, and beef and milk, respectively. Tables B.4-14(a) and B.4-14(b) compare the total South Field specific carcinogenic hazards and noncarcinogenic risks to the risks and hazards that can be attributed to naturally occurring levels of COCs.

Table B.4-14(a) illustrates that the total risk to this receptor assuming background concentrations of CPCs on the South Field would be 1.3×10^{-3}. This can be viewed as a "floor" against which to compare the South Field specific risk of 3.4×10^{-2}. Review of Table B.4-14(a) also indicates that the South Field risks due to all pathways are significantly greater than background risks. The major contributors to the South Field risks are radium-226, technetium-99, benzo(a)pyrene, and dibenzo(a,h)anthracene, of which only radium-226 is naturally occurring. A comparison of the total risks indicates that the presence of the South Field causes a 26 fold increase in the equivalent background risk determined by the same risk assessment methodology.

Table B.4-14(b) illustrates that the total hazard to this receptor assuming background concentrations of CPCs on the South Field would be 0.26. The South Field specific HI of 23 is due to the presence of total uranium in groundwater impacted by the South Field. Total uranium was not detected in background samples. The total HI for the South Field is 125 times greater than the equivalent risk due to background.

Tables B.4.15(a), B.4-15(b), B.4-15(c), and B.4-15(d) (Attachment III) present the background risks and HIs for the Inactive Flyash Pile future on-property RME farmer due to background levels of CPCs in surface soil, groundwater, homegrown produce, and beef and milk, respectively. Tables B.4-16(a) and B.4-16(b) compare the total Inactive Flyash Pile specific risk and HIs to the risks and hazards that can be attributed to naturally occurring levels of CPCs.

Table B.4-16(a) illustrates that the total risk to this receptor assuming background concentrations of CPCs would be 3.9×10^{-7}. This can be viewed as a "floor" against which to compare the Inactive Flyash Pile specific calculated risk of 1.3×10^{-3}. Review of Table B.4-16(a) also indicates that the

TABLE B.4-14(a)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
SOUTH FIELD: CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	CS-137	4.2E-05	0.36%	0.12%	3.7E-05	3.09%	2.80%
	NP-237	4.3E-06	0.04%	0.01%	0.0E+00	0.00%	0.00%
	PU-238	3.0E-07	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	2.0E-07	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	7.8E-03	68.39%	23.22%	3.1E-04	26.23%	23.80%
	RA-228	4.7E-04	4.12%	1.40%	1.4E-04	11.62%	10.55%
	SR-90	2.6E-07	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TC-99	8.7E-07	0.01%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	1.0E-03	9.14%	3.10%	2.6E-04	22.29%	20.23%
	TH-230	1.7E-05	0.15%	0.05%	1.9E-06	0.16%	0.14%
	TH-232	1.4E-03	12.55%	4.26%	3.9E-04	32.63%	29.61%
	U-234	9.9E-06	0.09%	0.03%	1.2E-06	0.10%	0.09%
	U-235/236	9.8E-06	0.09%	0.03%	9.8E-07	0.08%	0.07%
	U-238	3.5E-05	0.31%	0.10%	4.1E-06	0.34%	0.31%
	Total Radiological Risk	1.1E-02	95.25%	32.34%	1.1E-03	96.55%	87.23%
	Aroclor-1254	6.0E-06	0.05%	0.02%	0.0E+00	0.00%	0.00%
	Aroclor-1260	3.5E-06	0.03%	0.01%	0.0E+00	0.00%	0.00%
	Arsenic	3.5E-05	0.31%	0.10%	2.8E-05	2.37%	2.15%
	Benzo(a)anthracene	2.0E-05	0.17%	0.06%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	3.4E-04	2.98%	1.01%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	2.2E-05	0.20%	0.07%	0.0E+00	0.00%	0.00%
	Benzo(k)fluoranthene	2.6E-06	0.02%	0.01%	0.0E+00	0.00%	0.00%
	Beryllium	2.0E-05	0.18%	0.06%	1.3E-05	1.08%	0.98%
	Dibenzo(a,h)anthracene	6.9E-05	0.60%	0.20%	0.0E+00	0.00%	0.00%
	Dieldrin	1.2E-06	0.01%	0.00%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	2.2E-05	0.19%	0.06%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	5.4E-04	4.75%	1.61%	4.1E-05	3.45%	3.13%
	Total	1.1E-02	100.00%	33.95%	1.2E-03	100.00%	90.36%
Groundwater	NP-237	2.0E-07	0.02%	0.00%	0.0E+00	0.00%	0.00%
	SR-90	4.8E-08	0.00%	0.00%	6.5E-09	1.61%	0.00%
	TC-99	1.2E-07	0.01%	0.00%	0.0E+00	0.00%	0.00%
	U-234	3.7E-04	33.52%	1.10%	1.4E-07	34.64%	0.01%
	U-235/236	2.0E-05	1.79%	0.06%	1.3E-08	3.13%	0.00%
	U-238	7.1E-04	64.66%	2.11%	2.4E-07	60.62%	0.02%
	Total Radiological Risk	1.1E-03	100.00%	3.27%	4.0E-07	100.00%	0.03%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	1.1E-03	100.00%	3.27%	4.0E-07	100.00%	0.03%
Homegrown Produce (Dust Affected)	CS-137	5.4E-07	0.04%	0.00%	4.8E-07	0.96%	0.04%
	NP-237	6.1E-07	0.04%	0.00%	0.0E+00	0.00%	0.00%
	PU-238	1.6E-09	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	1.1E-09	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	4.7E-05	3.16%	0.14%	1.9E-06	3.76%	0.14%
	RA-228	7.5E-07	0.05%	0.00%	2.2E-07	0.44%	0.02%
	SR-90	1.9E-05	1.26%	0.06%	0.0E+00	0.00%	0.00%
	TC-99	3.6E-04	24.21%	1.06%	0.0E+00	0.00%	0.00%
	TH-228	2.7E-08	0.00%	0.00%	6.7E-09	0.01%	0.00%
	TH-230	2.1E-08	0.00%	0.00%	2.1E-09	0.00%	0.00%
	TH-232	7.8E-08	0.01%	0.00%	2.0E-08	0.04%	0.00%
	U-234	7.2E-07	0.05%	0.00%	8.6E-08	0.17%	0.01%
	U-235/236	7.3E-08	0.00%	0.00%	7.3E-09	0.01%	0.00%
	U-238	1.3E-06	0.09%	0.00%	1.6E-07	0.32%	0.01%
	Total Radiological Risk	4.3E-04	28.91%	1.27%	2.8E-06	5.73%	0.22%
	Aroclor-1254	6.3E-06	0.43%	0.02%	0.0E+00	0.00%	0.00%
	Aroclor-1260	8.3E-07	0.06%	0.00%	4.4E-05	88.62%	3.35%
	Arsenic	5.5E-05	3.73%	0.16%	0.0E+00	0.00%	0.00%
	Benzo(a)anthracene	6.0E-05	4.06%	0.18%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	5.7E-04	38.62%	1.70%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	3.7E-05	2.48%	0.11%	0.0E+00	0.00%	0.00%
	Benzo(k)fluoranthene	1.7E-06	0.11%	0.00%	0.0E+00	0.00%	0.00%

TABLE B.4-14(a)
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Homegrown Produce (Dust Affected) (Continued)	Beryllium	4.4E-06	0.30%	0.01%	2.8E-06	5.65%	0.21%
	Dibenzo(a,h)anthracene	4.3E-05	2.92%	0.13%	0.0E+00	0.00%	0.00%
	Dieldrin	2.5E-04	17.09%	0.75%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	1.9E-05	1.30%	0.06%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.0E-03	71.09%	3.13%	4.7E-05	94.27%	3.56%
	Total	1.5E-03	100.00%	4.40%	4.9E-05	100.00%	3.78%
Homegrown Produce (Groundwater Affected)	NP-237	6.2E-08	0.02%	0.00%	0.0E+00	0.00%	0.00%
	SR-90	1.7E-08	0.01%	0.00%	2.2E-09	1.84%	0.00%
	TC-99	3.7E-08	0.01%	0.00%	0.0E+00	0.00%	0.00%
	U-234	1.1E-04	33.52%	0.33%	4.2E-08	34.56%	0.00%
	U-235/236	5.9E-06	1.79%	0.02%	3.8E-09	3.13%	0.00%
	U-238	2.1E-04	64.66%	0.64%	7.4E-08	60.47%	0.01%
	Total Radiological Risk	3.3E-04	100.00%	0.99%	1.2E-07	0.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	100.00%	0.00%
	Total	3.3E-04	100.00%	0.99%	1.2E-07	100.00%	0.00%
Beef/Milk (Dust Affected)	CS-137	5.5E-06	0.03%	0.02%	4.9E-06	6.87%	0.37%
	NP-237	3.6E-08	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-238	2.2E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	1.5E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	1.1E-04	0.59%	0.34%	4.5E-06	6.36%	0.35%
	RA-228	1.8E-06	0.01%	0.01%	5.3E-07	0.75%	0.04%
	SR-90	8.3E-05	0.43%	0.25%	0.0E+00	0.00%	0.00%
	TC-99	7.8E-03	40.69%	23.32%	0.0E+00	0.00%	0.00%
	TH-228	6.2E-09	0.00%	0.00%	1.6E-09	0.00%	0.00%
	TH-230	4.7E-09	0.00%	0.00%	5.1E-10	0.00%	0.00%
	TH-232	1.8E-08	0.00%	0.00%	4.8E-09	0.01%	0.00%
	U-234	6.1E-07	0.00%	0.00%	7.4E-08	0.10%	0.01%
	U-235/236	6.3E-08	0.00%	0.00%	6.2E-09	0.01%	0.00%
	U-238	1.2E-06	0.01%	0.00%	1.3E-07	0.19%	0.01%
	Total Radiological Risk	8.0E-03	41.76%	23.91%	1.0E-05	14.29%	0.40%
	Aroclor-1254	4.9E-05	0.25%	0.15%	0.0E+00	0.00%	0.00%
	Aroclor-1260	2.1E-04	1.10%	0.63%	0.0E+00	0.00%	0.00%
	Arsenic	7.3E-05	0.38%	0.22%	5.8E-05	81.97%	4.45%
	Benzo(a)anthracene	1.6E-04	0.85%	0.49%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	5.4E-03	28.07%	16.09%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	3.7E-04	1.91%	1.09%	0.0E+00	0.00%	0.00%
	Benzo(k)fluoranthene	1.5E-04	0.80%	0.46%	0.0E+00	0.00%	0.00%
	Beryllium	4.2E-06	0.02%	0.01%	2.7E-06	3.75%	0.20%
	Dibenzo(a,h)anthracene	4.0E-03	20.80%	11.92%	0.0E+00	0.00%	0.00%
	Dieldrin	1.5E-07	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	7.8E-04	4.05%	2.32%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.1E-02	58.24%	33.37%	6.1E-05	85.71%	4.66%
	Total	1.9E-02	100.00%	57.28%	7.1E-05	100.00%	5.06%
Beef/Milk (Groundwater Affected)	NP-237	1.9E-10	0.00%	0.00%	0.0E+00	0.00%	0.00%
	SR-90	8.3E-09	0.03%	0.00%	1.1E-09	8.77%	0.00%
	TC-99	8.8E-08	0.27%	0.00%	0.0E+00	0.00%	0.00%
	U-234	1.1E-05	33.43%	0.03%	4.1E-09	32.12%	0.00%
	U-235/236	5.8E-07	1.78%	0.00%	3.7E-10	2.91%	0.00%
	U-238	2.1E-05	64.49%	0.06%	7.2E-09	56.21%	0.00%
	Total Radiological Risk	3.2E-05	100.00%	0.10%	1.3E-08	100.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	3.2E-05	100.00%	0.10%	1.3E-08	100.00%	0.00%
ALL MEDIA		3.4E-02			1.3E-03		

TABLE B.4-14(b)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
SOUTH FIELD: NON-CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	Arsenic	6.2E-02	78.67%	0.26%	4.9E-02	83.44%	18.99%
	Beryllium	1.5E-02	19.50%	0.07%	9.7E-03	16.56%	3.77%
	Dieldrin	1.4E-03	1.83%	0.01%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	7.8E-02	100.00%	0.33%	5.9E-02	100.00%	22.75%
	Total	7.8E-02	100.00%	0.33%	5.9E-02	100.00%	22.75%
Groundwater	Tributyl phosphate	8.6E-03	0.05%	0.04%	0.0E+00	0.00%	0.00%
	U-Total	1.8E+01	99.95%	75.66%	5.2E-03	0.00%	2.00%
	Total Chemical Risk	1.8E+01	100.00%	75.70%	5.2E-03	0.00%	2.00%
	Total	1.8E+01	100.00%	75.70%	5.2E-03	0.00%	2.00%
Homegrown Produce	Arsenic	1.0E-01	24.96%	0.45%	8.3E-02	99.84%	32.23%
	Beryllium	2.0E-04	0.05%	0.00%	1.3E-04	0.16%	0.05%
	Dieldrin	3.2E-01	74.99%	1.34%	0.0E+00	0.00%	0.00%
(Dust Affected)	*Total Chemical Risk*	4.2E-01	100.00%	1.79%	8.3E-02	100.00%	32.28%
	Total	4.2E-01	100.00%	1.79%	8.3E-02	100.00%	32.28%
Homegrown Produce	Tributyl phosphate	2.5E-03	0.05%	0.01%	0.0E+00	0.00%	0.00%
	U-Total	5.1E+00	99.95%	21.53%	0.0E+00	0.00%	0.00%
(Groundwater Affected)	*Total Chemical Risk*	5.1E+00	100.00%	21.54%	0.0E+00	0.00%	0.00%
	Total	5.1E+00	100.00%	21.54%	0.0E+00	0.00%	0.00%
Beef/Milk	Arsenic	1.4E-01	99.73%	0.59%	1.1E-01	99.89%	42.86%
(Dust Affected)	Beryllium	1.9E-04	0.14%	0.00%	1.2E-04	0.11%	0.05%
	Dieldrin	1.9E-04	0.13%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.4E-01	100.00%	0.60%	1.1E-01	100.00%	42.91%
	Total	1.4E-01	99.87%	0.60%	1.1E-01	100.00%	42.91%
Beef/Milk	Tributyl phosphate	7.6E-03	74.08%	0.03%	0.0E+00	0.00%	0.00%
(Groundwater Affected)	U-Total	2.7E-03	25.92%	0.01%	1.4E-04	0.00%	0.06%
	Total Chemical Risk	1.0E-02	100.00%	0.04%	1.4E-04	0.00%	0.06%
	Total	1.0E-02	100.00%	0.04%	1.4E-04	0.00%	0.06%
ALL MEDIA		2.3E+01			2.6E-01		

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TABLE B.4-16(a)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
INACTIVE FLYASH PILE: CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	NP-237	2.5E-09	0.24%	0.00%	0.0E+00	0.00%	0.00%
	PU-238	2.1E-09	0.20%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	5.2E-10	0.05%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	9.0E-09	0.88%	0.00%	5.6E-09	2.11%	1.42%
	RA-228	1.0E-09	0.10%	0.00%	5.1E-10	0.19%	0.13%
	SR-90	3.5E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	1.4E-07	13.47%	0.01%	5.7E-08	21.38%	14.40%
	TH-230	5.2E-08	5.11%	0.00%	2.8E-08	10.65%	7.17%
	TH-232	1.7E-07	16.37%	0.01%	7.7E-08	29.07%	19.58%
	U-234	1.5E-07	14.32%	0.01%	1.8E-08	6.62%	4.46%
	U-235/236	9.8E-09	0.96%	0.00%	1.5E-09	0.55%	0.37%
	U-238	3.0E-07	29.42%	0.02%	3.6E-08	13.74%	9.26%
	Total Radiological Risk	8.3E-07	81.12%	0.06%	2.2E-07	84.31%	56.78%
	Arsenic	1.8E-07	17.72%	0.01%	3.9E-08	14.83%	9.99%
	Beryllium	6.9E-09	0.68%	0.00%	2.3E-09	0.86%	0.58%
	Dibenzo(a,h)anthracene	4.9E-09	0.48%	0.00%	0.0E+00	0.00%	0.00%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	2-Methylnaphthalene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.9E-07	18.88%	0.01%	4.2E-08	15.69%	10.57%
	Total	1.0E-06	100.00%	0.07%	2.7E-07	100.00%	67.35%
Groundwater	NP-237	2.0E-07	0.02%	0.01%	0.0E+00	0.00%	0.00%
	SR-90	4.8E-08	0.00%	0.00%	6.5E-12	1.61%	0.00%
	TC-99	1.2E-07	0.01%	0.01%	0.0E+00	0.00%	0.00%
	U-234	3.7E-04	33.52%	25.13%	1.4E-10	34.64%	0.04%
	U-235/236	2.0E-05	1.79%	1.34%	1.3E-11	3.13%	0.00%
	U-238	7.1E-04	64.66%	48.47%	2.4E-10	60.62%	0.06%
	Total Radiological Risk	1.1E-03	100.00%	74.97%	4.0E-10	100.00%	0.10%
	2-Methylnaphthalene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Tributyl phosphate	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	1.1E-03	100.00%	74.97%	4.0E-10	100.00%	0.10%
Homegrown Produce (Dust Affected)	NP-237	2.4E-10	0.05%	0.00%	0.0E+00	0.00%	0.00%
	PU-238	1.5E-10	0.03%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	4.0E-11	0.01%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	1.3E-08	2.75%	0.00%	8.2E-09	8.19%	2.07%
	RA-228	1.9E-09	0.39%	0.00%	9.4E-10	0.95%	0.24%
	SR-90	7.9E-10	0.16%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	1.2E-09	0.25%	0.00%	5.0E-10	0.51%	0.13%
	TH-230	3.0E-10	0.06%	0.00%	1.6E-10	0.17%	0.04%
	TH-232	3.4E-09	0.70%	0.00%	1.6E-09	1.56%	0.39%
	U-234	1.1E-09	0.24%	0.00%	1.4E-10	0.14%	0.03%
	U-235/236	8.0E-11	0.02%	0.00%	1.2E-11	0.01%	0.00%
	U-238	2.1E-09	0.43%	0.00%	2.5E-10	0.25%	0.06%
	Total Radiological Risk	2.4E-08	5.09%	0.00%	1.2E-08	11.76%	2.98%
	Arsenic	3.3E-07	69.06%	0.02%	7.2E-08	72.22%	18.26%
	Beryllium	4.8E-08	10.09%	0.00%	1.6E-08	16.02%	4.05%
	Dibenzo(a,h)anthracene	7.5E-08	15.76%	0.01%	0.0E+00	0.00%	0.00%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	2-Methylnaphthalene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Tributyl phosphate	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	4.5E-07	94.91%	0.03%	8.8E-08	88.24%	22.31%
	Total	4.8E-07	100.00%	0.03%	1.0E-07	100.00%	25.29%

TABLE B.4-16(a)
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Homegrown Produce (Groundwater Affected)	NP-237	6.2E-08	0.02%	0.00%	0.0E+00	0.00%	0.00%
	SR-90	5.1E-08	0.02%	0.00%	6.9E-12	5.49%	0.00%
	U-234	1.1E-04	33.51%	7.57%	4.2E-11	33.27%	0.01%
	U-235/236	5.9E-06	1.79%	0.40%	3.8E-12	3.01%	0.00%
	U-238	2.1E-04	64.65%	14.61%	7.4E-11	58.23%	0.02%
	TC-99	3.7E-08	0.01%	0.00%	0.0E+00	0.00%	0.00%
	Total Radiological Risk	3.3E-04	100.00%	22.60%	1.3E-10	0.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	100.00%	0.00%
	Total	3.3E-04	100.00%	22.60%	1.3E-10	100.00%	0.00%
Beef/Milk (Dust Affected)	NP-237	1.1E-12	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-238	8.4E-15	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	2.4E-15	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	2.3E-09	0.13%	0.00%	1.4E-09	5.08%	0.37%
	RA-228	2.2E-10	0.01%	0.00%	1.1E-10	0.39%	0.03%
	SR-90	2.5E-09	0.14%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	1.7E-12	0.00%	0.00%	6.8E-13	0.00%	0.00%
	TH-230	1.9E-12	0.00%	0.00%	1.1E-12	0.00%	0.00%
	TH-232	2.1E-11	0.00%	0.00%	9.9E-12	0.03%	0.00%
	U-234	1.6E-10	0.01%	0.00%	1.9E-11	0.07%	0.00%
	U-235/236	1.1E-11	0.00%	0.00%	1.7E-12	0.01%	0.00%
	U-238	2.9E-10	0.02%	0.00%	3.5E-11	0.12%	0.01%
	Total Radiological Risk	5.5E-09	0.30%	0.00%	1.6E-09	5.70%	0.04%
	Arsenic	1.1E-07	6.33%	0.01%	2.5E-08	87.88%	6.35%
	Beryllium	5.5E-09	0.30%	0.00%	1.8E-09	6.42%	0.46%
	Dibenzo(a,h)anthracene	1.7E-06	93.06%	0.12%	0.0E+00	0.00%	0.00%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	2-Methylnaphthalene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.8E-06	99.70%	0.01%	2.7E-08	94.30%	6.81%
	Total	1.8E-06	100.00%	0.01%	2.8E-08	100.00%	6.85%
Beef/Milk (Groundwater Affected)	NP-237	1.9E-10	0.00%	0.00%	0.0E+00	0.00%	0.00%
	SR-90	8.6E-08	0.27%	0.01%	1.2E-11	49.90%	0.00%
	U-234	1.1E-05	33.35%	0.74%	4.1E-12	17.64%	0.00%
	U-235/236	5.8E-07	1.78%	0.04%	3.7E-13	1.60%	0.00%
	U-238	2.1E-05	64.33%	1.42%	7.2E-12	30.86%	0.00%
	TC-99	8.8E-08	0.27%	0.01%	0.0E+00	0.00%	0.00%
	Total Radiological Risk	3.2E-05	100.00%	2.21%	2.3E-11	100.00%	0.01%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	3.2E-05	100.00%	2.21%	2.3E-11	100.00%	0.01%
ALL MEDIA		1.5E-03			3.9E-07		

TABLE B.4-16(b)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
INACTIVE FLYASH PILE: NON-CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	N/A						
Groundwater	Tributyl phosphate	8.6E-03	0.05%	0.04%	0.0E+00	0.00%	0.00%
	U-TOTAL	1.8E+01	99.95%	82.33%	5.2E-03	0.00%	80.01%
	Total Chemical Risk	1.8E+01	100.00%	82.37%	5.2E-03	0.00%	80.01%
	Total	1.8E+01	100.00%	82.37%	5.2E-03	0.00%	80.01%
Homegrown Produce (Dust Affected)	Arsenic	6.3E-04	99.64%	0.00%	1.4E-04	99.46%	2.12%
	Beryllium	2.2E-06	0.36%	0.00%	7.4E-07	0.54%	0.01%
	Total Chemical Risk	6.3E-04	100.00%	0.00%	1.4E-04	100.00%	2.13%
	Total	6.3E-04	100.00%	0.00%	1.4E-04	100.00%	2.13%
Homegrown Produce (Groundwater Affected)	Tributyl phosphate	1.7E-03	0.05%	0.01%	0.0E+00	0.00%	0.00%
	U-TOTAL	3.3E+00	99.95%	15.34%	9.6E-04	0.00%	14.90%
	Total Chemical Risk	3.3E+00	100.00%	15.34%	9.6E-04	0.00%	14.90%
	Total	3.3E+00	100.00%	15.34%	9.6E-04	0.00%	14.90%
Beef/Milk (Dust Affected)	Arsenic	2.2E-04	99.88%	0.00%	4.8E-05	99.82%	0.74%
	Beryllium	2.6E-07	0.12%	0.00%	8.5E-08	0.18%	0.00%
	Total Chemical Risk	2.2E-04	100.00%	0.00%	4.8E-05	100.00%	0.74%
	Total	2.2E-04	100.00%	0.00%	4.8E-05	100.00%	0.74%
Beef/Milk (Groundwater Affected)	Tributyl phosphate	1.0E-06	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-TOTAL	4.9E-01	100.00%	2.28%	1.4E-04	0.00%	2.22%
	Total Chemical Risk	4.9E-01	100.00%	2.28%	1.4E-04	0.00%	2.22%
	Total	4.9E-01	100.00%	2.28%	1.4E-04	0.00%	2.22%
ALL MEDIA		2.2E+01			6.5E-03		

Inactive Flyash Pile groundwater affected and dust affected beef/milk pathway's risk are the only ones greater than one order of magnitude higher than background risks. Groundwater is the significant pathway for the Inactive Flyash Pile, contributing 98 percent of the total risk. Surface soils are the primary contributor to risks from background. A comparison of the total risks indicates that the presence of the Inactive Flyash Pile causes a 3800 times the equivalent background risk determined by the same risk assessment methodology.

Table B.4-16(b) illustrates that the total background HI "floor" associated with RME farmer receptor at the Inactive Flyash Pile is 0.0065. The Inactive Flyash Pile specific HI of 22 is attributable almost entirely to the presence of total uranium in groundwater (and subsequently homegrown produce and beef and milk).

Tables B.4-17(a) through B.4-17(c) (Attachment III) present the background risks and HI for the Solid Waste Landfill future on-property RME farmer due to background levels of CPCs. Tables B.4-18(a) and B.4-18(b) compare the total Solid Waste Landfill specific risk and HI to the risks and hazards that can be attributed to the naturally occurring levels of CPCs. Table B.4-18(a) illustrates that the total risk to this receptor assuming background concentrations of CPCs would be 1.2×10^{-3}. This can be viewed as a "floor" against which to compare the Solid Waste Landfill specific calculated risk of 2.8×10^{-3}. Review of Table B.4-18(a) also indicates that the Solid Waste Landfill risks due to produce and beef/milk pathways are about one order of magnitude higher than background risks, but that the soil pathway, which drives the risk, is very similar (1.8×10^{-3} versus 1.1×10^{-3}). Groundwater risks are not present for background but the groundwater risk for the Solid Waste Landfill is low. A comparison of the total risks indicates that the presence of the Solid Waste Landfill causes a two fold increase in the equivalent background risk determined by the same risk assessment methodology.

Table B.4-18(b) illustrates that the total hazard to this receptor assuming background concentrations of CPCs on the Solid Waste Landfill would be 0.25. The Solid Waste Landfill specific HI of 0.29 is due to the presence of arsenic and beryllium in surface soil. The contribution to the HI from the Solid Waste Landfill is almost undetectable in comparison to background.

Table B.4-19(a) through B.4-19(d) (Attachment III) present the background risks and HIs for the Lime Sludge Ponds future on-property RME farmer due to background levels of CPCs. Table B.4-20(a) and B.4-20(b) compare the total Lime Sludge Ponds specific risk and HIs to the risks and

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TABLE B.4-18(a)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
SOLID WASTE LANDFILL: CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	NP-237	2.3E-05	1.28%	0.82%	0.0E+00	0.00%	0.00%
	PU-238	1.1E-06	0.06%	0.04%	0.0E+00	0.00%	0.00%
	PU-239/240	1.2E-07	0.01%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	3.5E-04	19.86%	12.76%	3.1E-04	27.71%	25.13%
	RA-228	2.0E-04	11.40%	7.33%	1.4E-04	12.28%	11.14%
	SR-90	1.5E-07	0.01%	0.01%	0.0E+00	0.00%	0.00%
	TH-228	3.8E-04	21.38%	13.74%	2.6E-04	23.24%	21.08%
	TH-230	2.4E-06	0.13%	0.09%	4.3E-07	0.04%	0.03%
	TH-232	5.4E-04	30.08%	19.34%	3.7E-04	32.95%	29.89%
	U-234	1.5E-05	0.82%	0.53%	3.7E-07	0.03%	0.03%
	U-235/236	2.9E-05	1.64%	1.06%	1.2E-06	0.10%	0.09%
	U-238	1.7E-04	9.39%	6.03%	1.8E-06	0.16%	0.15%
	Total Radiological Risk	1.7E-03	96.06%	61.74%	1.1E-03	96.52%	87.54%
	Arsenic	3.0E-05	1.70%	1.09%	2.6E-05	2.34%	2.13%
	Benzo(a)anthracene	1.3E-06	0.07%	0.05%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	1.2E-05	0.69%	0.44%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	2.6E-06	0.14%	0.09%	0.0E+00	0.00%	0.00%
	Benzo(g,h,i)perylene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	1.5E-05	0.83%	0.54%	1.3E-05	1.14%	1.03%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Dibenzo(a,h)anthracene	7.2E-06	0.40%	0.26%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	1.7E-06	0.10%	0.06%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	7.0E-05	3.94%	2.53%	3.9E-05	3.48%	3.16%
	Total	1.8E-03	100.00%	64.27%	1.1E-03	100.00%	90.70%
Groundwater	TC-99	3.9E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Radiological Risk	3.9E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	3.9E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
Homegrown Produce (Dust Affected)	NP-237	3.4E-06	2.80%	0.12%	0.0E+00	0.00%	0.00%
	PU-238	1.0E-08	0.01%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	1.1E-09	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	2.1E-06	1.76%	0.08%	1.9E-06	3.80%	0.15%
	RA-228	3.2E-07	0.27%	0.01%	2.2E-07	0.45%	0.02%
	SR-90	1.1E-05	9.20%	0.40%	0.0E+00	0.00%	0.00%
	TH-228	9.9E-09	0.01%	0.00%	6.8E-09	0.01%	0.00%
	TH-230	9.4E-09	0.01%	0.00%	2.2E-09	0.00%	0.00%
	TH-232	2.9E-08	0.02%	0.00%	2.0E-08	0.04%	0.00%
	U-234	3.5E-06	2.89%	0.13%	8.3E-08	0.17%	0.01%
	U-235/236	2.3E-07	0.19%	0.01%	7.3E-09	0.01%	0.00%
	U-238	1.1E-05	9.26%	0.40%	1.6E-07	0.32%	0.01%
	Total Radiological Risk	3.2E-05	26.42%	1.15%	2.4E-06	4.81%	0.19%
	Arsenic	5.1E-05	41.95%	1.82%	4.4E-05	89.48%	3.54%
	Benzo(a)anthracene	4.0E-06	3.31%	0.14%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	2.1E-05	17.11%	0.74%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	4.2E-06	3.48%	0.15%	0.0E+00	0.00%	0.00%
	Benzo(g,h,i)perylene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	3.3E-06	2.70%	0.12%	2.8E-06	5.71%	0.23%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Dibenzo(a,h)anthracene	4.5E-06	3.76%	0.16%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	1.5E-06	1.28%	0.06%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Phenanthrene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	8.9E-05	73.58%	3.20%	4.7E-05	95.19%	3.77%
	Total	1.2E-04	100.00%	4.34%	4.9E-05	100.00%	3.96%

TABLE B.4-18(a)
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Homegrown	TC-99	1.3E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
Produce	*Total Radiological Risk*	1.3E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
(Groundwater	*Total Chemical Risk*	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
Affected)	*Total*	1.3E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
Beef/Milk	NP-237	2.0E-07	0.02%	0.01%	0.0E+00	0.00%	0.00%
(Dust	PU-238	1.5E-10	0.00%	0.00%	0.0E+00	0.00%	0.00%
Affected)	PU-239/240	1.6E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	5.1E-06	0.59%	0.19%	4.5E-06	6.83%	0.37%
	RA-228	7.8E-07	0.09%	0.03%	5.3E-07	0.80%	0.04%
	SR-90	5.0E-05	5.72%	1.80%	0.0E+00	0.00%	0.00%
	TH-228	2.3E-09	0.00%	0.00%	1.6E-09	0.00%	0.00%
	TH-230	2.2E-09	0.00%	0.00%	5.1E-10	0.00%	0.00%
	TH-232	6.7E-09	0.00%	0.00%	4.6E-09	0.01%	0.00%
	U-234	3.0E-06	0.34%	0.11%	7.1E-08	0.11%	0.01%
	U-235/236	2.0E-07	0.02%	0.01%	6.2E-09	0.01%	0.00%
	U-238	9.6E-06	1.10%	0.34%	1.3E-07	0.20%	0.01%
	Total Radiological Risk	6.9E-05	7.89%	2.28%	5.3E-06	7.96%	0.06%
	Arsenic	6.7E-05	7.72%	2.42%	5.8E-05	88.01%	4.71%
	Benzo(a)anthracene	1.1E-05	1.25%	0.39%	0.0E+00	0.00%	0.00%
	Benzo(a)pyrene	2.0E-04	22.43%	7.04%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	4.2E-05	4.83%	1.52%	0.0E+00	0.00%	0.00%
	Benzo(g,h,i)perylene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	3.1E-06	0.36%	0.11%	2.7E-06	4.02%	0.22%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Dibenzo(a,h)anthracene	4.2E-04	48.36%	15.18%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	6.2E-05	7.16%	2.25%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Phenanthrene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	8.0E-04	92.11%	28.91%	6.1E-05	92.04%	4.92%
	Total	8.7E-04	100.00%	31.19%	6.6E-05	100.00%	4.98%
Beef/Milk	TC-99	3.5E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
(Groundwater	*Total Radiological Risk*	3.5E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
Affected)	*Total Chemical Risk*	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	3.5E-08	100.00%	0.00%	0.0E+00	0.00%	0.00%
ALL MEDIA		2.8E-03			1.2E-03		

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TABLE B.4-18(b)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
SOLID WASTE LANDFILL: NON-CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	Arsenic	5.7E-02	83.32%	19.37%	4.9E-02	83.44%	19.38%
	Beryllium	1.1E-02	16.68%	3.88%	9.7E-03	16.56%	3.85%
	Total Chemical Risk	6.8E-02	100.00%	23.25%	5.9E-02	100.00%	23.23%
	Total	6.8E-02	100.00%	23.25%	5.9E-02	100.00%	23.23%
Groundwater	N/A						
Homegrown Produce (Dust Affected)	Arsenic	9.6E-02	99.84%	32.90%	8.3E-02	99.84%	32.91%
	Beryllium	1.5E-04	0.16%	0.05%	1.3E-04	0.16%	0.05%
	Total Chemical Risk	9.6E-02	100.00%	32.95%	8.4E-02	100.00%	32.96%
	Total	9.6E-02	100.00%	32.95%	8.4E-02	100.00%	32.96%
Homegrown Produce (Groundwater Affected)	N/A						
Beef/Milk (Dust Affected)	Arsenic	1.3E-01	99.89%	43.75%	1.1E-01	99.89%	43.76%
	Beryllium	1.4E-04	0.11%	0.05%	1.2E-04	0.11%	0.05%
	Total Chemical Risk	1.3E-01	100.00%	43.80%	1.1E-01	100.00%	43.81%
	Total	1.3E-01	100.00%	43.80%	1.1E-01	100.00%	43.81%
Beef/Milk (Groundwater Affected)	N/A						
ALL MEDIA		2.9E-01			2.5E-01		

TABLE B.4-20(a)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
LIME SLUDGE PONDS: CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	CS-137	2.3E-11	0.00%	0.00%	1.5E-11	0.00%	0.00%
	NP-237	3.6E-08	0.34%	0.28%	0.0E+00	0.00%	0.00%
	PU-238	3.9E-08	0.37%	0.30%	0.0E+00	0.00%	0.00%
	PU-239/240	8.9E-09	0.08%	0.07%	0.0E+00	0.00%	0.00%
	RA-226	2.3E-08	0.22%	0.18%	1.5E-08	2.17%	1.50%
	RA-228	2.0E-09	0.02%	0.02%	1.4E-09	0.20%	0.14%
	SR-90	8.5E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-228	4.0E-07	3.72%	3.04%	1.5E-07	22.09%	15.27%
	TH-230	2.3E-06	21.28%	17.41%	7.5E-08	10.95%	7.57%
	TH-232	2.5E-07	2.35%	1.93%	2.1E-07	30.04%	20.77%
	U-234	9.5E-07	8.94%	7.31%	4.7E-08	6.79%	4.70%
	U-235/236	7.6E-08	0.71%	0.58%	3.8E-09	0.56%	0.38%
	U-238	6.4E-06	60.76%	49.69%	9.8E-08	14.20%	9.82%
	Total Radiological Risk	1.0E-05	98.80%	80.81%	6.0E-07	86.99%	60.15%
	Arsenic	1.0E-07	0.99%	0.81%	8.5E-08	12.30%	8.50%
	Benzo(a)pyrene	6.5E-09	0.06%	0.05%	0.0E+00	0.00%	0.00%
	Benzo(a)anthracene	5.4E-10	0.01%	0.00%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	5.9E-10	0.01%	0.00%	0.0E+00	0.00%	0.00%
	bis(2-Ethylhexyl)phthala	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	1.2E-08	0.12%	0.10%	4.9E-09	0.71%	0.49%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Dibenzo(a,h)anthracene	1.9E-09	0.02%	0.01%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	4.3E-10	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Phenanthrene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Phenanthrene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-Total	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.3E-07	1.20%	0.98%	8.9E-08	13.01%	9.00%
	Total	1.1E-05	100.00%	81.79%	6.9E-07	100.00%	69.15%
Groundwater	TC-99	1.9E-07	100.00%	1.45%	0.0E+00	0.00%	0.00%
	Total Radiological Risk	1.9E-07	100.00%	1.45%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	1.9E-07	100.00%	1.45%	0.0E+00	0.00%	0.00%
Homegrown Produce (Dust Affected)	CS-137	6.1E-10	0.10%	0.00%	3.9E-10	0.17%	0.04%
	NP-237	3.9E-09	0.66%	0.03%	0.0E+00	0.00%	0.00%
	PU-238	2.8E-09	0.48%	0.02%	0.0E+00	0.00%	0.00%
	PU-239/240	6.9E-10	0.12%	0.01%	0.0E+00	0.00%	0.00%
	RA-226	3.8E-08	6.55%	0.30%	2.5E-08	10.70%	2.47%
	RA-228	3.6E-09	0.62%	0.03%	2.5E-09	1.10%	0.25%
	SR-90	8.9E-10	0.15%	0.01%	0.0E+00	0.00%	0.00%
	TH-228	3.5E-09	0.60%	0.03%	1.3E-09	0.59%	0.14%
	TH-230	1.3E-08	2.24%	0.10%	4.4E-10	0.19%	0.04%
	TH-232	5.0E-09	0.85%	0.04%	4.1E-09	1.80%	0.42%
	U-234	7.9E-09	1.34%	0.06%	3.9E-10	0.17%	0.04%
	U-235/236	6.5E-10	0.11%	0.01%	3.3E-11	0.01%	0.00%
	U-238	4.7E-08	7.95%	0.36%	7.1E-10	0.31%	0.07%
	Total Radiological Risk	1.3E-07	21.76%	0.99%	3.5E-08	15.03%	3.48%
	Aroclor-1254	5.6E-09	0.96%	0.04%	0.0E+00	0.00%	0.00%
	Arsenic	1.9E-07	32.64%	1.48%	1.5E-07	67.26%	15.55%
	Benzo(a)pyrene	1.0E-07	17.57%	0.80%	0.0E+00	0.00%	0.00%
	Benzo(a)anthracene	8.9E-09	1.51%	0.07%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	9.3E-09	1.58%	0.07%	0.0E+00	0.00%	0.00%
	Benzo(g,h,i)perylene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	bis(2-Ethylhexyl)phthala	1.7E-09	0.29%	0.01%	0.0E+00	0.00%	0.00%
	Beryllium	1.0E-07	17.54%	0.79%	4.1E-08	17.71%	4.09%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Dibenzo(a,h)anthracene	2.9E-08	5.01%	0.23%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	6.6E-09	1.13%	0.05%	0.0E+00	0.00%	0.00%

TABLE B.4-20(a)
(continued)

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Homegrown Produce (Dust Affected)	Phenanthrene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	4.5E-07	78.24%	3.54%	2.0E-07	84.97%	19.64%
	Total	5.8E-07	100.00%	4.53%	2.3E-07	100.00%	23.12%
Homegrown Produce (Groundwater Affected)	TC-99	6.1E-08	100.00%	0.47%	6.1E-11	0.00%	0.01%
	Total Radiological Risk	6.1E-08	100.00%	0.47%	6.1E-11	0.00%	0.01%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	6.1E-08	100.00%	0.47%	6.1E-11	0.00%	0.01%
Beef/Milk (Dust Affected)	CS-137	2.9E-09	0.21%	0.02%	1.9E-09	2.41%	0.19%
	NP-237	3.6E-11	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-238	2.0E-13	0.00%	0.00%	0.0E+00	0.00%	0.00%
	PU-239/240	1.3E-13	0.00%	0.00%	0.0E+00	0.00%	0.00%
	RA-226	1.7E-08	1.20%	0.13%	1.1E-08	13.87%	1.07%
	RA-228	4.3E-10	0.03%	0.00%	3.0E-10	0.39%	0.03%
	SR-90	1.4E-09	0.10%	0.01%	0.0E+00	0.00%	0.00%
	TH-228	4.8E-12	0.00%	0.00%	1.8E-12	0.00%	0.00%
	TH-230	9.2E-11	0.01%	0.00%	3.1E-12	0.00%	0.00%
	TH-232	3.2E-11	0.00%	0.00%	2.7E-11	0.03%	0.00%
	U-234	1.4E-09	0.10%	0.01%	6.9E-11	0.09%	0.01%
	U-235/236	1.2E-10	0.01%	0.00%	5.9E-12	0.01%	0.00%
	U-238	8.3E-09	0.60%	0.06%	1.3E-10	0.16%	0.01%
	Total Radiological Risk	3.1E-08	2.27%	0.22%	1.3E-08	16.97%	1.13%
	Aroclor-1254	1.8E-08	1.32%	0.14%	0.0E+00	0.00%	0.00%
	Arsenic	6.7E-08	4.81%	0.51%	5.4E-08	69.89%	5.40%
	Benzo(a)pyrene	4.2E-07	30.01%	3.21%	0.0E+00	0.00%	0.00%
	Benzo(a)anthracene	1.3E-08	0.94%	0.10%	0.0E+00	0.00%	0.00%
	Benzo(b)fluoranthene	3.9E-08	2.80%	0.30%	0.0E+00	0.00%	0.00%
	Benzo(g,h,i)perylene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Beryllium	2.6E-08	1.84%	0.20%	1.0E-08	13.14%	1.02%
	Lead	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Indeno(1,2,3-cd)pyrene	8.0E-08	5.79%	0.62%	0.0E+00	0.00%	0.00%
	Phenanthrene	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	TH-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	U-TOTAL	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	1.4E-06	97.73%	10.45%	6.4E-08	83.03%	6.42%
	Total	1.4E-06	100.00%	10.67%	7.7E-08	100.00%	7.54%
Beef/Milk (Groundwater Affected)	TC-99	1.4E-07	100.00%	1.11%	0.0E+00	0.00%	0.00%
	Total Radiological Risk	1.4E-07	100.00%	1.11%	0.0E+00	0.00%	0.00%
	Total Chemical Risk	0.0E+00	0.00%	0.00%	0.0E+00	0.00%	0.00%
	Total	1.4E-07	100.00%	1.11%	0.0E+00	0.00%	0.00%
ALL MEDIA		1.3E-05			9.9E-07		

TABLE B.4-20(b)
COMPARISON SUMMARY OF BACKGROUND RISKS TO ON-SITE RISKS
LIME SLUDGE PONDS: NON-CARCINOGENS

Medium	Parameter	On-Property Resident Farmer (RME)	% of Total Medium Risk	% of Total Receptor Risk	Background	% of Total Medium Risk	% of Total Receptor Risk
Soil	N/A						
Groundwater	N/A						
Homegrown Produce (Dust Affected)	Arsenic	3.7E-04	27.91%	21.07%	2.9E-04	94.80%	70.79%
	bis(2-Ethylhexyl)phthala	6.2E-06	0.47%	0.36%	0.0E+00	0.00%	0.00%
	Beryllium	4.8E-06	0.37%	0.28%	1.9E-06	0.61%	0.46%
	U-TOTAL	9.3E-04	71.25%	53.78%	1.4E-05	4.59%	3.42%
	Total Chemical Risk	1.3E-03	100.00%	21.70%	3.1E-04	100.00%	71.25%
	Total	1.3E-03	100.00%	21.70%	3.1E-04	100.00%	71.25%
Homegrown Produce (Groundwater Affected)	N/A						
Beef/Milk (Dust Affected)	Arsenic	1.3E-04	29.85%	7.32%	1.0E-04	97.14%	24.60%
	bis(2-Ethylhexyl)phthala	1.3E-04	30.77%	7.55%	0.0E+00	0.00%	0.00%
	Beryllium	1.2E-06	0.28%	0.07%	4.7E-07	0.45%	0.11%
	U-TOTAL	1.7E-04	39.10%	9.59%	2.5E-06	2.41%	0.61%
	Total Chemical Risk	4.3E-04	100.00%	24.52%	1.1E-04	100.00%	25.33%
	Total	4.3E-04	100.00%	24.52%	1.1E-04	100.00%	25.33%
Beef/Milk (Groundwater Affected)	N/A						
ALL MEDIA		1.7E-03			4.2E-04		

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hazards that can be attributed to the naturally occurring levels of CPCs. Table B.4-20(a) illustrates that the total risk to this receptor assuming background concentrations of CPCs would be 9.9×10^{-7}. This can be viewed as a "floor" against which to compare the Lime Sludge Ponds specific calculated risk of 1.3×10^{-5}. Review of Table B.4-20(a) also indicates that the Lime Sludge Ponds risks for each pathway are greater than background risks, indicating that the Lime Sludge Ponds are impacting all pathways. Exposure to surface soil or produce and beef/milk effected by surface soils drive the risk for both the Lime Sludge Ponds and background risks. A comparison of the total risks indicates that the presence of the Lime Sludge Ponds causes a 13 fold increase in the equivalent background risk determined by the same risk assessment methodology.

Table B.4-20(b) illustrates that the total hazard to this receptor assuming background concentrations of CPCs on the Lime Sludge Ponds would be 4.2×10^{-4}. The Lime Sludge Ponds specific HI of 1.7×10^{-3} is due predominantly to the presence of arsenic and Uranium-Total in surface soil. The contribution to the HI from the Lime Sludge Ponds is 4 times the background hazard.

B.4.3 UNCERTAINTIES

The types and magnitudes of uncertainties associated with each stage of the process are of major importance for evaluating and interpreting risk assessments at the FEMP. Uncertainties associated with calculations that occur in the risk assessment may be magnified in the final results. While it is not possible to eliminate all uncertainties from the analysis, they must be identified and discussed to determine their significance when making risk management decisions. This section presents an analysis of the major uncertainties contributing to the final results of the Operable Unit 2 baseline risk assessment.

B.4.3.1 Terminology

This section introduces the evaluation of uncertainties inherent in the risk assessment process. Uncertainty is a measure of inaccuracy that must be considered in each step of the CPC selection process, exposure and toxicity assessments and risk characterization presented in the preceding sections. Each portion of the analysis contributes to the uncertainty of the final risk assessment. Uncertainty in CPC selection is primarily associated with the analytical data and procedures used to include or exclude constituents as CPCs. Uncertainty associated with the exposure assessment includes variations in sample analytical results, the values used for variables as input to a given intake route, the methods used and assumptions made to determine exposure point concentrations, the

accuracy with which a particular fate and transport model represents actual environmental processes, and the manner in which the exposure scenario is developed. Uncertainty associated with the toxicity assessment includes the quality of the existing data to support a dose-response assessment, the high-to-low dose and interspecies extrapolations for dose-response relationships, and the weight of evidence used for determining the carcinogenicity of CPCs. Uncertainty associated with risk characterization includes that associated with exposure to multiple chemicals (i.e., additivity of dose, synergisms and antagonisms among chemicals, and the particular mode of action for each chemical), and the cumulative uncertainty from combining conservative assumptions made in the data, exposure assessment, and toxicity assessment. Each of these categories of potential uncertainty is discussed in this section.

Generally, risk assessments carry two types of uncertainty, measurement and informational uncertainty; each merits consideration. Measurement uncertainty refers to the usual variance that accompanies scientific measurements (e.g., instrument uncertainty associated with contaminant concentrations). This type of uncertainty is generally associated with the analytical data, which impacts CPC selection and calculation of exposure point concentrations. The risk assessment results reflect the accumulated variances of the individual measured values used. A different kind of uncertainty stems from inadequate availability of information needed to complete the toxicity and exposure assessments. Often this informational gap is significant, such as the absence of information on the effects of human exposure to low doses of a chemical or on the biological mechanism of action of an agent (EPA 1992d).

Once the risk assessment is complete, the results must be reviewed and evaluated to identify the type and magnitude of uncertainty involved. Reliance on results from a risk assessment without consideration of uncertainties, limitations, and assumptions inherent in the risk assessment process can often be misleading. For example, to account for uncertainties in the development of exposure assumptions, conservative estimates must be made to ensure that the particular assumptions made are protective of all sensitive subpopulations, or maximum exposed individuals. If a number of conservative assumptions are combined in an exposure model, the resulting calculations can propagate the uncertainties associated with those assumptions, producing a much larger uncertainty for the final results. Thus, both the risk assessment's results and the uncertainties associated with those results should be considered when making risk management decisions.

This interpretation is especially relevant when resulting risk numbers exceed the point-of-departure for defining acceptable risk. For example, when a calculated risk incorporating a high degree of uncertainty falls below an acceptable risk level (e.g., below an incremental lifetime cancer risk [ILCR] of 10^{-6}), the interpretation is straight forward. However, when calculated risks, incorporating a high degree of uncertainty, fall above an acceptable risk level (e.g., exceed an ILCR of 10^{-4}),} decision making can be difficult unless all of the uncertainties inherent in the calculations are carefully considered.

The actual risk may be one, two, or even three orders of magnitude smaller than the one calculated, which could lead risk managers to make a decision which is unnecessarily protective. This situation may occur in a Superfund risk assessment when the estimated risks are based on limited information. Calculations, exposure parameters, conservative assumptions on lifestyles and land-use scenarios, and maximum or near-maximum values for many of the modeling and exposure variables must be carefully assessed to ensure that the risks are not underestimated. The combination of conservative assumptions over a number of areas often results in high risk values as a result of high uncertainty. Characterization of risk based on overly conservative model parameters, scenarios, and assumptions does not convey realistic information and is often misleading if reviewed out of context. A risk estimate for an RME individual in a Superfund risk assessment has been frequently and mistakenly viewed as an average risk to the receptor population being evaluated (EPA 1992d).

Such conservatism has been incorporated into the RME scenarios for Operable Unit 2 risk assessment. Although it is possible that the exposure, dose, and sensitivity combinations assumed might occur in the receptor population of interest, the probability of an individual actually receiving this degree of exposure is expected to be low.

Recent EPA guidance on risk assessment (EPA 1992d) requires risk assessors to use exposure and toxicity assumptions that are from the "high end" and "central tendency" of their distributions. These values correspond to the reasonable maximum exposure (RME) and central tendency (CT) scenarios, respectively, for the risk assessment. The RME scenario is to be a combination of average and upper-bound assumptions that estimate the reasonable maximum exposure for that pathway. The resulting risk for the RME scenario is assumed to fall between the average (i.e., the CT scenario) and the upper-bound scenario (a scenario that is based on all maximum values). The CT scenario is a combination of all average and median values for exposure parameters that provide an estimate of

average risk posed to the receptor population being considered. It should be noted here that the CT scenario used in Operable Unit 2 incorporates many maximal values by direction of EPA Region V staff. The purpose for consideration of risks from both the CT and RME scenarios is to provide bounds on the expected risks posed by the site.

The ultimate goal of the risk assessment process is to provide an objective, realistic, and balanced risk estimate for making risk management decisions at the FEMP. In the past, Superfund risk assessments based on the "Risk Assessment Guidance for Superfund" (EPA 1989a) yielded calculated risks only for RME scenarios. The Operable Unit 2 RI incorporates this concept into the risk assessments at the FEMP. Accordingly, the risk assessment for Operable Unit 2 includes an additional scenario considering some average assumptions for the on-property resident adult. Based on the future land-use scenario, the on-property resident adult constitutes the most important receptor since they have the highest risk. This attempt at characterizing the CT scenario side-by-side with the RME scenario presents a more realistic estimate of the range of possible risk for this receptor. Efforts will continue to incorporate the guidance as more exposure data at the FEMP become available and the additional guidance on estimating CT is completed by EPA.

B.4.3.2 Sources of Uncertainty in Operable Unit 2

As noted previously, uncertainties are associated with the information and data used for the selection of CPCs, exposure and toxicity assessments, and risk characterization for the Operable Unit 2 baseline risk assessment. Uncertainty in the selection of CPCs is associated with the analytical data. In the exposure assessment, these uncertainties are the result of a number of factors, including assumptions on land use and receptors, assumptions made for parameters and parameter variability (random errors or natural variations), and the necessity of using computer models to predict complex environmental interactions. Uncertainty associated with the toxicity assessment is associated with the dose-response data. As EPA has pointed out in their guidance for human health risk assessments, "it is more important to identify the key site-related variables and assumptions that contribute most to the uncertainty than to precisely quantify the degree of uncertainty in the risk assessment" (EPA 1989a). Uncertainties are evaluated in this section to provide a basis for interpreting the overall quality of the risk assessment results. Sources of uncertainty are discussed below.

B.4.3.2.1 Selection of Constituents of Potential Concern

Uncertainty associated with the selection process used to determine the CPCs in Operable Unit 2 can be attributed to the following major sources:

- Evaluation of the existing data raises the question as to whether all pockets of elevated contamination have been identified. In general, it is believed that they have been identified for most radionuclides at the FEMP because of the detailed CIS field screening program performed. This is particularly important because risks from radionuclides dominate the overall risks to all receptors evaluated in this risk assessment. No conclusion can be drawn for chemical constituents detected on the property. The impact of this uncertainty to total risk for a receptor may underestimate the risk by as much as one order of magnitude.

- Sample analytical techniques produce results that have an unknown degree of uncertainty associated with them. These uncertainties are documented by using data qualifiers to reflect the assumed degree of certainty of measurement. These analytical uncertainties affect the selection of CPCs or the calculation of exposure point concentrations (either measured or modeled) that may be based on a particular analytical result. Data qualifiers were interpreted in a way that produced more false positives than negatives, causing a conservative impact and possible increasing risks up to one order of magnitude.

- Concentrations of inorganics and radionuclides are compared to background concentrations to determine if their presence is do to naturally occurring concentrations from native soils or are due to site activities. However, sampling procedures for groundwater and air used to determine background concentrations have high detection limits. A chemical that was not detected during background sampling could result in the erroneous inclusion of a chemical from those selected for further evaluation. The impact of this uncertainty is conservative by including CPCs that could be at background, causing a possible increase in risk by one order of magnitude.

- The selection of CPCs includes minimally detected compounds or compounds with a small data set. The screening process for handling minimally detected compounds is to include the compound as a CPC if it was detected once or more in more than one media (e.g., strontium-90 is detected once out of 20 samples in soils, and once out of 10 samples in surface water). In this instance the one or two hits are assumed to be hot-spot indications and not outliers, and are conservatively included as CPCs if the highest hit passes the other screening criteria. This conservative assumption ignores the many non-detected values in a population and overestimates the impact of that compound on the risk. The impact of this uncertainty on risks to receptors could overestimate the risk by greater than one order of magnitude.

B.4.3.2.2 Uncertainty in Exposure Assessment

Sources of uncertainty for the exposure assessment arise from calculation of exposure point concentrations, selection of receptors, determination of land use scenarios and selection of exposure factors.

B.4.3.2.3 Exposure Point Concentrations

Uncertainty associated with calculation of exposure point concentrations in Operable Unit 2 can be attributed to the following sources:

- According to the "Risk Assessment Guidance for Superfund" (EPA 1989a), the UCLs are used for all exposure concentrations. This means that 95 percent of the time, the actual mean concentration can be less than the value used in the exposure assessment. Conversely, 5 percent of the time the actual mean concentration can be greater than the value used in the exposure assessment. Therefore the exposure assessment may underestimate the exposures in 5 percent of the cases, and overestimate exposures 95 percent of the time. This assumption will overestimate the risk by maximally exposing the receptor. The impact varies depending on concentration distribution, but could be up to one order of magnitude.

- Sample analytical techniques produce results that have a degree of uncertainty associated with them. These uncertainties are documented by using data qualifiers to reflect the degree of uncertainty of measurement. These analytical uncertainties affect the exposure point concentrations (either measured or modeled) that may be based on a particular analytical result. Data qualifiers were interpreted in a way that produced more fals positives than false negatives, causing an overestimation of risk by up to one order of magnitude.

- There is also large uncertainty when exposure concentrations were based on the maximum detected concentration. The conservative approach was taken in the statistical interpretation for the selection of minimally detected compounds and their concentration term. The screening methodology for handling minimally detected compounds was to include the compound in the risk assessment if it was detected more than once in more than one media (e.g. strontium-90 is detected once out of 20 samples in soils, and once out of 10 samples in surface water). In this instance it is difficult to determine statistical properties of a data set when most of the samples are non-detects, or when there are only a few data points. The screening methodology is to set the concentration term, which is used as the source term in the risk assessment, to the highest detection when a 95 UCL cannot be calculated. An example of this is technetium-99 in the South Field. Technetium-99 was only detected once out of 21 samples in the surface soil and 4 times out of 90 samples in the subsurface soil, but since it was detected more than once it was included as a CPC for the South Field. Since there were so few detections, the screening methodology took the highest detection as the concentration term to be used in the risk assessment. The maximum hit was 142 pCi/g, 20 times greater than the mean of 7 pCi/g. So the risk assessment assumed that a concentration of 142 pCi/g of technetium-99 was present across the surface of the South Field, and as a result technetium-99 drives 46 to 51 percent of the total Great Miami River recreational and

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residential user risks, 23 percent of the RME farmers total risk, 18 percent of the CT farmers total risk, and 14 percent of the on-property child's total risk. This is a large overestimation of risk due to technetium-99 as a result of taking the maximum hit when a 95 UCL could not be determined. This uncertainty could overestimate risks by more than one order of magnitude.

Predicted concentrations were used as exposure point concentrations when measured data were not available (e.g., the future). These predictions were made using mathematical representations (models) of the natural systems found or suspected to exist in the study area. Due to the complexity of natural environments, conservative assumptions were often used in these models to calculate exposure point concentrations. When a number of conservative assumptions are combined into one fate and transport model, uncertainties can be compounded and provide very conservative estimates of the exposure point concentration. These assumptions are typically made to avoid underestimating the concentrations of contaminants in transport or exposure media (e.g., air or groundwater). As a result, transport parameters are chosen from the upper bound of possible alternative values and the uncertainties associated with modeled concentrations will generally be much larger than those associated with measured data. Uncertainties associated with modeled exposure point concentrations in Operable Unit 2 can be attributed to the following sources:

- Use of Toxicity Characteristic Leaching Procedure (TCLP) data to characterize leachate concentrations in the natural environment adds conservatism to the groundwater fate and transport modeling process because TCLP leaching is performed with an acidic solution. This tends to overestimate the leachate concentration of inorganics over natural (more neutral) leaching conditions. This impact is less than one order of magnitude overestimation.

- The selection of parameters related to the attenuation and retardation of constituents is a major uncertainty in the analysis. The attenuation and retardation factors of every constituent except uranium were determined after an extensive literature search. It should be noted here that the actual retardation factors at the FEMP may not follow the assumed literature values, particularly over the long term. Site-specific attenuation and retardation factors are used when available. The use of site-specific values are assumed to result in lower uncertainty than using literature values. The impact on risk could overestimate or underestimate risks up to one order of magnitude.

- The organic decay rates at the FEMP were determined after an extensive literature search. The actual decay rates may or may not follow the assumed literature values because of site-specific conditions. The use of site data to determine organic decay rates is assumed to result in lower uncertainty than that resulting from the use of literature values. The variation could impact risk, potentially causing their overestimation or underestimation by up to one order of magnitude.

- Transport through the vadose zone is approximated by using a one-dimensional model and assuming that each of the two zones is homogeneous. The unsaturated seepage flow rate is a function of several parameters, such as porosity, residual saturation, and pore size distribution index. Due to the heterogeneous nature of the till, these parameters change from location to location and from depth to depth. This uncertainty could cause the overestimation or underestimation of risks by up to one order of magnitude.

- The total mass of each contaminant is calculated by multiplying the UCL by the volume of the entire waste area, except for uranium-238 which was kriged, thus assuming the UCL concentration is uniformly distributed through the entire source. This uncertainty could overestimate or underestimate risks by one to two orders of magnitude because the UCL is often much greater than the mean concentration.

- The fate and transport modeling uses a "70-year rule" for these constituents where no or inadequate leachate data exist. This "rule" assumes all the chemical leaches from a particular waste unit in 70 years. This method is considered very conservative for compounds that are insoluble but may underestimate the maximum exposure for soluble compounds. However, the application of this methodology to these constituents is considered conservative because these particular compounds have rather low solubilities and high partitioning coefficients. PAHs, in general, contribute an insignificant proportion to the total hazard index. Therefore, the application of this assumption is assumed to have a low impact on the risk assessment. Although it may underestimate maximum exposure concentration for soluble compounds, it also overestimates exposure time. this uncertainty could overestimate the risk due to certain constituents by more than one order of magnitude.

- Air modeling is based on a number of conservative assumptions. In combination these assumptions appear to overestimate the exposure point concentrations for air based on site air monitoring data and according to a literature search for typical ambient air PM_{10} measurements for EPA Region V. The long-term average PM_{10} concentrations calculated are comparable to measured dust concentrations on constructions. This uncertainty is expected to moderately overestimate risk (i.e., overestimate risks by 1 to 2 orders-of-magnitude).

- The future configuration of the Operable Unit 2 subunits is uncertain at this time; thus, a reasonable worst-case configuration is used to determine source concentrations for both air and surface water modeling. If the actual configuration differs from that used in this evaluation, the future source concentrations may change and the models will have incorrectly estimated the exposure point concentrations. This uncertainty could cause an overestimation or underestimation of risks by up to one order of magnitude.

- The transport models individually made assumptions regarding the fate of individual constituents within source media. However, these models were not combined or linked to consider assumptions made regarding depletion of chemicals from one model and the effect of that assumption on another model (i.e., the leaching models did not consider source depletion from volatilization or fugitive emissions and the air emissions models did not consider losses via leaching). Furthermore, the direct exposure pathways to a particular source

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(i.e., incidental ingestion of surface soil) did not consider source depletion by leaching, surface water transport, or air emissions. Consequently, this assumption is considered very conservative, causing an overestimation of one to two orders of magnitude for the pathways impacted.

These uncertainties for modeling collectively are assumed to moderately overestimate the concentrations expected in groundwater and for aerial deposition (i.e., overestimate concentration and risk by a factor of one to two orders of magnitude).

Models were also used to calculate chemical concentrations in plants and animals. Each time concentrations at one level in the food chain are extrapolated from a lower level, uncertainty is introduced into the result. For example, soil-to-plant transfer factors (B_{iv} values) generally represent the maximum amount of contaminant transfer that may occur. In reality, the contaminant transfer is quite dependent on the form of the constituent (e.g., metal species) and other site-related physical conditions (e.g., soil type). Thus actual site transfer factors are unknown. The values chosen are intended to be conservative and they are likely to overestimate risk.

B.4.3.2.4 Determination of Land Uses

A major uncertainty associated with predicting future exposures at the FEMP is the future disposition of the property itself. Because it is not possible to accurately predict what the future uses of the land may be the most conservative (rather than the most likely) land use is evaluated, as stipulated by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). As noted in Section E.3.0, one of the on-property residents evaluated under future land use for Operable Unit 2 is the resident farmer. The assumption of the resident farmer for future land use provides a worst-case scenario regarding future land use in the exposure assessment.

B.4.3.2.5 Selection of Receptors

The receptors selected for evaluation in this assessment have been generally selected to reflect and encompass those types of activities which may produce the reasonable maximum exposure individual. Uncertainty associated with the selection of receptors in the current land use scenario is assumed to be low (over- or underestimate risks by a one order of magnitude or less) because the current site environmental setting and configuration was the basis for selection of these receptors. Uncertainty associated with receptors identified in the future land use scenario is high (i.e., potential to

overestimate risk by two or more orders-of-magnitude) due to the low probability of the site being used as a residence or for agricultural purposes.

B.4.3.2.6 Determination of Exposure Factors

Each exposure factor selected for use in this risk assessment has some uncertainty associated with it. Generally these factors are based on surveys of physiological and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally have a broad distribution. To avoid the underestimation of exposure, this risk assessment followed EPA's recommendation and used the 95th percentile for most of the exposure parameters used in this risk assessment. In other words, the values selected represent the observed or expected habits of a small percentage of the population (usually the upper 5 or 10 percent). For example, the resident farmer scenarios were assumed to inhale air at the location of the highest annual average concentration for 350 days per year for 70 years. Seventy years represents the maximum exposure duration and is not based on a statistical assessment of local or regional residence time for farm families. This factor tends to overestimate risk.

Generally, the uncertainty can be assessed quantitatively for a number of assumptions made in determining factors for calculating exposure and intakes. Many of these parameters were determined from statistical analyses on human population characteristics. Often the database used to summarize a particular exposure parameter (i.e., inhalation rate) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty (i.e., over or underestimate risks by one order of magnitude or less). For many parameters for which limited information exists (i.e., dermal adsorption of organic chemicals from soils) there is greater uncertainty. However, there is often sufficient data to estimate these parameters with low uncertainty. Few intake parameters have high uncertainty associated with them. In the risk assessment for Operable Unit 2, the particular exposure parameters with the greatest uncertainty are judged to be those associated with time (combination of frequency and duration on the site). The particular exposure pathway with the combination of exposure parameters with the highest uncertainty is dermal contact, which is assumed to result in moderate uncertainty (over- or underestimate actual exposure by one to two orders of magnitude) for exposure.

Many of the quantities used to calculate exposures and risks in this report are selected from a distribution of possible values. For the RME scenarios, the value representing the 95th percentile is

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generally selected for each parameter to assure that the assessment bounds the actual risks from a postulated exposure. This risk number is used in risk management decisions, but does not indicate what a more average exposure might be, or what risk range might be expected for individuals in the exposed population. To address these issues, a risk estimate closer to the central tendency is presented for the maximally exposed individual using the CT scenario described in Section B.2.0. The range of risk for this receptor from the CT scenario to the RME scenario seeks to incorporate the range of uncertainty regarding intake assumptions for this receptor.

B.4.3.3 Toxicity Assessment

Uncertainty associated with the toxicity assessment is associated with hazard assessment and dose-response evaluations for CPCs. The hazard assessment deals with characterizing the nature and strength of the evidence of causation, or the likelihood that a chemical that induces adverse effects in animals will induce adverse effects in humans. Hazard assessment of carcinogenicity is evaluated as a weight-of-evidence determination, using either the IARC (1987) or EPA (1986b) methods. Positive animal cancer test data suggest that human tissue(s) may also manifest a carcinogenic response; however, animal data do not always accurately predict the same response on the same target tissue in humans. In the hazard assessment of noncancer effects, however, positive animal data suggest the nature of the possible adverse effects (i.e., the target tissues and type of effects) anticipated to occur in humans (EPA 1989f).

Uncertainty in hazard assessment arises from the nature and quality (sensitivity and selectivity) of the animal and human data. Uncertainty is decreased when similar effects are observed across species, strain, sex, and exposure route; when the magnitude of the response is clearly dose-related; when pharmacokinetic data indicate a similar fate in animals and humans; when postulated mechanisms of toxicity are similar for humans and animals; and when the CPC is structurally similar to other chemicals for which the toxicity is more completely characterized.

Uncertainty in the dose-response evaluation includes the determination of a slope factor for the carcinogenic assessment and derivation of an RfD or RfC for the noncarcinogenic assessment. Uncertainty is introduced from interspecies (animal-to-human) extrapolation, which, in the absence of quantitative pharmacokinetic, dosimetric, or mechanistic data, is usually based on consideration of interspecies differences in basic metabolism. Uncertainty also results from intraspecies, or individual, variation. Most toxicity experiments are performed with animals that are very similar in age and

genotype, so that intragroup biological variation is minimal. However the human population of concern may reflect a great deal of heterogeneity including unusual sensitivity or tolerance to the CPC. Even toxicity data from human occupational exposures reflect a bias because only those individuals sufficiently healthy to attend work regularly and those not unusually sensitive to the CPC, are likely to be occupationally exposed. Finally, uncertainty arises from the quality of the key study (from which the quantitative estimate is derived) and the database. For cancer effects, the uncertainty associated with dose-response factors is mitigated by assuming the 95 percent upper bound for the slope factor. Another source of uncertainty regarding quantitative risk estimation for the carcinogenic assessment is the method by which high dose data animal studies are extrapolated to the dose range expected for environmentally exposed humans. The linearized multistage model, which is used in nearly all quantitative estimations of human risk from animal data, is based on a nonthreshold assumption of carcinogenesis. An impressive body of evidence, however, suggests that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are noncarcinogenic (Williams and Weisburger 1991); therefore, the use of the linearized multistage model is conservative for chemicals that exhibit a threshold for carcinogenicity.

For noncancer effects, additional uncertainty factors may be applied in the derivation of the RfD or RfC to mitigate poor quality of the key study or gaps in the database. Additional uncertainty for noncancer effects arises from use of an effect level in the estimation of an RfD or RfC, because this estimation is predicated on the assumption of a threshold below which adverse effects are not expected. Therefore, an additional uncertainty factor is usually applied to estimate a no-effect level. Additional uncertainty arises from estimation of an RfD or RfC for chronic exposure from less than chronic data. Unless empirical data indicate that effects do not worsen with increasing duration of exposure, an additional uncertainty factor is applied to the no-effect level in the less than chronic study. Uncertainty in the derivation of reference doses is mitigated by the use of uncertainty and modifying factors that normally range between three and ten. Uncertainty factors (UF) and modifying factors (MF) are assigned as follows:

- A UF of ten is used to account for sensitive subpopulations.
- A UF of ten is used when extrapolating from animals to humans to account for interspecies variability.
- A UF of ten is applied to a NOAEL (no observed adverse effect level) derived from a subchronic study rather than a chronic study.

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- A UF of ten is applied to a LOAEL (lowest observed adverse effect level) to estimate a NOAEL.

- An MF from zero to ten is applied to data to reflect the quality of the data from the critical study used to derive the reference dose.

As a result, a combination of uncertainty and modifying factors may exceed 100, 1000, or more for a particular compound. These uncertainty factors are discussed in Section B.2.5 for the CPCs in Operable Unit 2.

Uncertainty arises in the dose-response assessment for Operable Unit 2 for values derived for principle CPCs from studies with limitations. As an example of this type of uncertainty, consider the toxicity information for uranium. Uranium as an alpha particle emitter is also considered a carcinogen; however, absolute evidence of uranium-induced excess human cancer risks are very difficult to obtain. This is largely because the human data available for radiocarcinogenic effects of uranium exposure are for underground miners, who are also simultaneously exposed to radon and radon progeny as a confounding factor. The studies of humans frequently lack information concerning uranium exposure, potential uranium exposure through previous employment, concurrent smoking patterns, or concurrent radon exposure levels. Accurate exposure data are needed to more definitively determine the risk attributable to uranium exposure. The human studies of cancer from exposure to uranium frequently reveal a slight excess risk above the natural risk. These facts weaken the power of the human studies to detect any excess risk. These uncertainties are not well known or easily determined and, as a consequence, introduce moderate to high uncertainty into the Operable Unit 2 risk assessment.

Other toxicity information used in the Operable Unit 2 risk assessment that introduces uncertainty include:

- The EPA inhalation slope factor of 7.7×10^{-12} pCi^{-1} for Rn-222 plus its daughters is used to calculate risks resulting from indoor inhalation of radon gases. The EPA bases this slope factor on a 50 percent equilibrium ratio between Rn-222 and its short-lived daughters. Studies cited in NCRP Report No. 78 (NCRP, 1984) report a lower value for this equilibrium ratio in indoor air (i.e.: 100/50/30/20/20 for Ra-222, Po-218, Pb-214, Bi-214, and Po-214, respectively). Since the concentration of daughters expected in indoor air is lower than the EPA assumption, the slope factor is probably conservative in this respect.

- PAHs that are classified as B2 probable human carcinogens for which no toxicity data were available are evaluated using benzo(a)pyrene toxicity data. This assumption likely leads to an overestimation of the carcinogenicity of those PAHs because conservative assumptions were used to relate their carcinogenicity to that of benzo(a)pyrene. However, when toxicity equivalency factors were used in this assessment to evaluate their carcinogenicity, this may either underestimate or overestimate the carcinogenic risks. Overall, this increased conservatism does not significantly impact the overall risks from Operable Unit 2 since the majority of risks are posed by other CPCs.

- The only PCB with positive carcinogenicity results is Aroclor-1260. The carcinogenicity of all PCB isomers were assumed to be equal to the carcinogenicity of Aroclor-1260 because the dose-response data for other isomers are inconclusive. Statistically significant cancer results were not seen for Aroclors with lower percentages of chlorine atoms. The conservatism introduced in the evaluation of PCBs is not anticipated to impact the selection of CPCs for final risks because they did not exceed the concentration-toxicity screen.

- As with PAHs, the carcinogenicity of dioxins and furans other than the 2,3,7,8-isomer were determined using EPA's revised Toxicity Equivalency Factors (TEFs) in the absence of toxicity values for the different isomers (Clement International, 1990). The TEFs are based on the assumption that all dioxin and furan congeners are carcinogenic. This may introduce a large positive bias to the results of the assessment.

A significant source of uncertainty for calculating risks from radionuclides in surface soil is the use of EPA slope factors for external radiation exposure. In deriving these slope factors, EPA has assumed that an individual continuously stands on an infinitely thick slab of soil with a uniform radionuclide concentration. To manage complicated calculations for photon attenuation and scattering in soil, EPA has assumed that the activity in the slab source is present on an infinite plane with uniform surface concentration. The slope factors for external radiation exposure are, therefore, based on calculated exposures (and associated risks of cancer incidence) from the hypothetical plane source.

In addition, EPA calculates slope factors for ingestion of many radionuclides using the maximum value for the GI absorption factor. The actual chemical form(s) that influence the magnitude of the GI absorption factor have not been considered.

To summarize, the uncertainty associated with the toxicity assessment is chemical-specific since it depends on the existing information used to derive the dose-response factor. In general, this uncertainty tends to be more high (overestimate risks by two or more orders of magnitude) for the chemical risk assessment, but tends to be low (overestimate risks by an order or magnitude or less) for radionuclides. This difference is the result of animal versus human data used for chemical and radiological compounds, respectively.

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B.4.3.4 Risk Characterization

Uncertainty in risk characterization results from assumptions made regarding additivity of effects from exposure to multiple compounds from various exposure routes. High uncertainty exists when summing cancer risks or hazard indices for several substances across different exposure pathways. This assumes that each substance has a similar effect and/or mode of action. Often compounds affect different organs, have different mechanisms of action, and differ in their fate in the body where additivity is not appropriate. However, the assumption of additivity is made to provide a conservative estimate of risk. This particular source of uncertainty is insignificant for Operable Unit 2 because the majority of cancer risks and hazard index is due to a few constituents of potential concern (CPCs).

Risk characterization does not consider antagonistic or synergistic effects. Little to no information is available to determine the potential for antagonism or synergism for CPCs. Therefore, this uncertainty cannot be discussed based on the impact on the risk assessment since it has the potential to either over-or under-estimate potential human health risks.

The additivity of risks from radionuclides and chemical carcinogens is the subject of considerable debate. EPA guidance (EPA 1989a) indicates that the two sets of estimates should be considered separately because 1) chemical CSFs are developed using laboratory experiments and radionuclide toxicity values are based on human epidemiological data, and 2) chemical CSFs represent an upper bound limit value while radionuclide slope factors are "best estimates." Therefore, cancer risks from exposure to radionuclides are presented separately from those from chemical CPCs.

B.4.3.5 Summary of Uncertainties in Operable Unit 2 Baseline Risk Assessment

Although uncertainties arise from many sources, those deriving from the toxicity assessment (i.e., determination of dose-response factors) provide the greatest uncertainty for the chemical risk assessment because few chemical dose-response factors are based on human epidemiological studies. Thus, extrapolations from animal studies must be made. For the radiological assessment, the greatest uncertainty arises from the exposure assessment where exposure point concentration are often based on the maximum reported analytical result, and where conservative assumptions were made regarding future land uses and exposure scenarios. Unlike chemical toxicity data, radiological dose-response factors are derived from human studies which is assumed to result in lower uncertainty.

Generally, uncertainty arises wherever data gaps exist. Data gaps in the risk assessment were mitigated by making conservative assumptions for individual parameters. Significant uncertainty results for those particular pathways that required fate and transport modeling to support the assessment of exposure. Such uncertainty was generated for the air and groundwater pathways of exposure. Thus, interpretation of risk from these media must consider the high uncertainty. Also, certain exposure pathways for a particular medium tend to have higher or lower uncertainty depending on their assumptions. For example, incidental ingestion of soils by residents tends to have significantly less uncertainty than ingestion of fruits and vegetables, and meat and milk raised on contaminated soils. These latter exposure pathways must make some assumptions regarding their uptake from soil to plant and plant to live stock while the soil ingestion pathway does not.

Receptors with the highest uncertainty in the current source term are the off-property resident farmer and off-property user of meat/milk from livestock grazed on site. The off-property resident farmer scenario is evaluated based on modeled concentrations for the air pathway and results in high uncertainty. The bioaccumulation of CPCs into meat/milk are modeled, and as a result, provide moderate to high uncertainty for this receptor. The greatest uncertainty in the risk assessment of Operable Unit 2 is associated with the assumptions made in the future source. These particular receptors include the on-property resident farmer, Great Miami River user, and off-property used of meat and milk. For the on-property resident farmer and home builder, the highest uncertainty is associated with the proposed land used and potential exposure pathway. This receptor scenario is included in response to guidance and is anticipated to have a low likelihood of occurrence due to the history of the site and the particular waste management activities within Operable Unit 2. Uncertainty associated with the off-property resident farmer and Great Miami River water user is primarily the result of surface water and air modeling used to support those scenarios. The modeling assumptions are conservative, which result in conservative estimates for the exposure point concentrations.

Taken together, the uncertainties identified with site data, exposure parameters, fate and transport, toxicity assessment and risk characterization are judged to be high (i.e., potential to over-estimate risk by two or more orders of magnitude).

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Attachment
B.I

ATTACHMENT B.I

DESCRIPTION AND RESULTS OF INDOOR RADON MODELING

ATTACHMENT B.I

DESCRIPTION AND RESULTS OF INDOOR RADON MODELING

The modeling results contained in this attachment are reproduced from two reports prepared by Fluor Daniel, Inc.: (1) The Screening Level Indoor Radon Modeling Report for the Operable Unit 2 Remedial Investigation, dated October 21, 1993; and (2) the Screening-Level Indoor Radon Modeling for the Solid Waste Landfill, dated October 22, 1993. These documents and transmittal letters have been reproduced here with the permission of Fluor Daniel, Inc.

The Screening-Level Indoor Radon Modeling Report for the Operable Unit 2 Remedial Investigation appears as Attachment IIa. The Screening-Level Indoor Radon Modeling for the Solid Waste Landfill appears as Attachment IIb.

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SCREENING-LEVEL INDOOR RADON MODELING

Introduction

This study was conducted to rapidly select or develop appropriate screening-level models for determining potential indoor Rn-222 concentrations from FEMP soil contaminated with Ra-226. The selection criteria include: 1) peer reviewed and published in literature, 2) demonstrated reproducible results, 3) produced reasonable results compared to measured data, 4) compatible with personal computers. In addition, models developed for regulatory agencies were weighted heavily in the selection process. Six models found in literature were initially reviewed: Nazaroff and Sextro (1989); Loureiro (1987); Garbes and Sextro (1989); Johnson and Ettinger (1991); Bruno (1983); and Nielson et al. (1993a and 1993b).

The final form of the model developed by Johnson and Ettinger (1991) addresses contaminants that do not undergo chemical transformation or decay; therefore, this model was dropped from further consideration. The model developed by Garbes and Sextro (1989) addresses the transport of radon through permeable but intact (no cracks or gaps) basement walls. Studies by Bruno (1983), Loureiro et al. (1990), Nazaroff and Sextro (1989), and Nazaroff et al. (1987) indicate that most soil gas enters buildings through cracks in the surface or subsurface flooring or through below-grade gaps around pipes or drains. Therefore, the Garbesi and Sextro (1989) model was dropped from further consideration. The model developed by Loureiro (1987) is not easily adaptable to spreadsheet calculations and had not been compiled for use on personal computers. In addition, the model is more rigorous than necessary for the screening-level analysis anticipated for this study. Therefore, this model was dropped from further consideration. The Loureiro (1987) model may be useful if a more detailed analysis is warranted based on results of the screening-level analysis.

The model developed by Nazaroff and Sextro (1989) is similar to that originally presented by Bruno (1983). The model development presented in Nazaroff and Sextro (1989) is more complete; therefore, it is used as a screening level model for this study. The model presented in Nazaroff and Sextro was developed specifically for houses with below-grade basements. The model accounts for various parameters associated with the soil (radium concentration, radon emanation coefficient, density, porosity, permeability), soil gas (dynamic viscosity), and house (size, basement depth, basement crack width, indoor to outdoor pressure differential, and ventilation rate) to determine the indoor radon concentration. Since site-specific soil parameters can be used in the model, it was considered appropriate for Operable Unit 2 indoor radon analyses for houses with below-grade basements.

Nielson et al. (1993a) have recently completed development of the computer program RAETRAD, Version 3.1, for calculating radon emanation and transport into dwellings. The model is designed for use with the Microsoft Windows 3.1 environment on a personal computer and is available from the EPA Office of Air Quality Planning and Standards, Air and Energy Engineering Research Laboratory. In its current form, this model is only applicable to slab-on-grade house construction. Since this model does consider site-specific data, it is also considered appropriate for Operable Unit 2 indoor radon analyses for slab-on-grade houses.

Nazaroff-Sextro Model

Nazaroff and Sextro (1989) originally developed this model to determine indoor Rn-222 concentrations from the measured Rn-222 source potential of the surrounding soil (based on measured Rn-222 concentrations in the soil gas). The source potential can also be calculated from the measured Ra-226 activity concentrations in the soil. Such activity concentrations (in pCi/g) from the South Field are used in this screening-level analysis to calculate the Rn-222 source potential and resulting indoor Rn-222 concentrations. The basic assumption for Nazaroff-Sextro model is that a negative pressure difference exists between the basement and the surrounding soil. This pressure difference is the driving force for soil gas entrainment into the basement.

The significant parameters that must be calculated for this analysis include the release rate of Rn-222 from the soil into the soil gas, G [pCi/(m^3•s)], the radon activity flux (or source potential) into the basement gap or crack, F [pCi/s], and the indoor Rn-222 concentration, C^{Rn}_{in} [pCi/m^3]. The method for calculating G and F is based on fundamental radon production and transport equations.

The following equation can be used to calculate G:

$$G = (10^6)\, E\, \rho_s\, C_S^{Ra}\, \lambda\, (1 - n)/n, \quad \frac{pCi}{m^3 \cdot s}$$

where
- E = radon emanation coefficient,
- ρ_s = density of the soil particles, g/cm^3,
- C_S^{Ra} = Ra-226 concentration in the soil, pCi/g,
- λ = Rn-222 decay constant, 1/s, and
- n = total soil porosity.

Two cases of interest arise when for determining the radon flux into the crack or gap: 1) low soil gas flow rates into the gap and 2) high soil gas flow rates into the gap. For the low-flow case, the radon activity flux is directly proportioned to the pressure difference:

$$F = (2\pi GL\Delta Pk) / [\mu\lambda \ln (2H/r)]$$

where	L	=	perimeter length of the basement, m,
	ΔP	=	dynamic pressure difference, Pa = kg/(m•^{2}),
	k	=	intrinsic permeability of the soil, m^2,
	μ	=	dynamic viscosity of the soil gas, kg/(m•s),
	H	=	depth of basement floor below the soil surface, m, and
	r	=	half-width of crack or radius of cylindrical gap in basement floor, m.

For the high-flow case, the radon concentration at the crack surface is depleted because of the short travel time of soil gas parcels through the soil, relative to the radon half-life. This depletion regime occurs under the condition:

$$\Delta P\, k > 0.5 n\mu\lambda H^2 \ln (2H/r)$$

When this condition exists, the radon activity flux is given by:

$$F = (4.0)\, GLH^{2/3}\, n^{1/3} \left[\frac{\Delta Pk}{\mu\lambda \ln (2H/r)}\right]^{2/3}$$

Once the source potential, F, has been determined, the indoor Rn-222 concentration can be calculated:

$$C_{in}^{Rn} = F/Qv$$

where	C_{in}^{Rn}	=	indoor Rn-222 concentration, pCi/m^3, and
	Qv	=	flow rate of outdoor air into the building, m^3/s.

The flow rate of outdoor air into the building can be estimated from the building volume and the ventilation rate (or air turnover rate). The ventilation rate is a measure of how quickly indoor air and outdoor air can exchange places through cracks and openings in the building or through air conditioning fans. The ventilation rate is usually reported as the number of building volumes (of air) that are exchanged per time. The flow rate of outdoor air into the building is estimated by:

$$Qv = q\ (l\ w\ h) / 3600$$

where
- q = ventilation rate, building volumes/hr,
- l = building length, m,
- w = building width, m, and
- h = building height, m.

The dimensions defined in this screening analysis are presented on Figure 1.

Several underlying assumptions were made to develop an analytical solution to the screening level model. These assumptions include (Nazaroff and Sextro 1989):

1. The soil has uniform and isotropic properties.
2. The soil containing Ra-226 lies directly beneath and adjacent to the basement.
3. Molecular diffusion can be neglected compared to bulk soil gas flow as a radon transport process.
4. The building has a basement floor with a crack or gap penetrating to the soil beneath the floor and extending around the building perimeter and has uniform width.
5. The moisture content of the soil is low enough that dissolved Rn-222 may be neglected.
6. The soil gas velocity through the soil is described by Darcy's law; the soil gas flow rate is low enough to be in the laminar-linear regime.
7. Pressure disturbances associated with Rn-222 migration in soil are negligible compared to atmospheric pressure; therefore, soil gas and air are treated as incompressible fluids.
8. The system being modeled is at steady-state conditions.
9. The interior of the building can be treated as a single, well-mixed volume.
10. The radon entry rate from soil is equal to the radon source potential.
11. The radon decay rate is much slower than the building ventilation rate.

The potential effect of these assumptions on the estimated indoor radon concentrations are briefly discussed below.

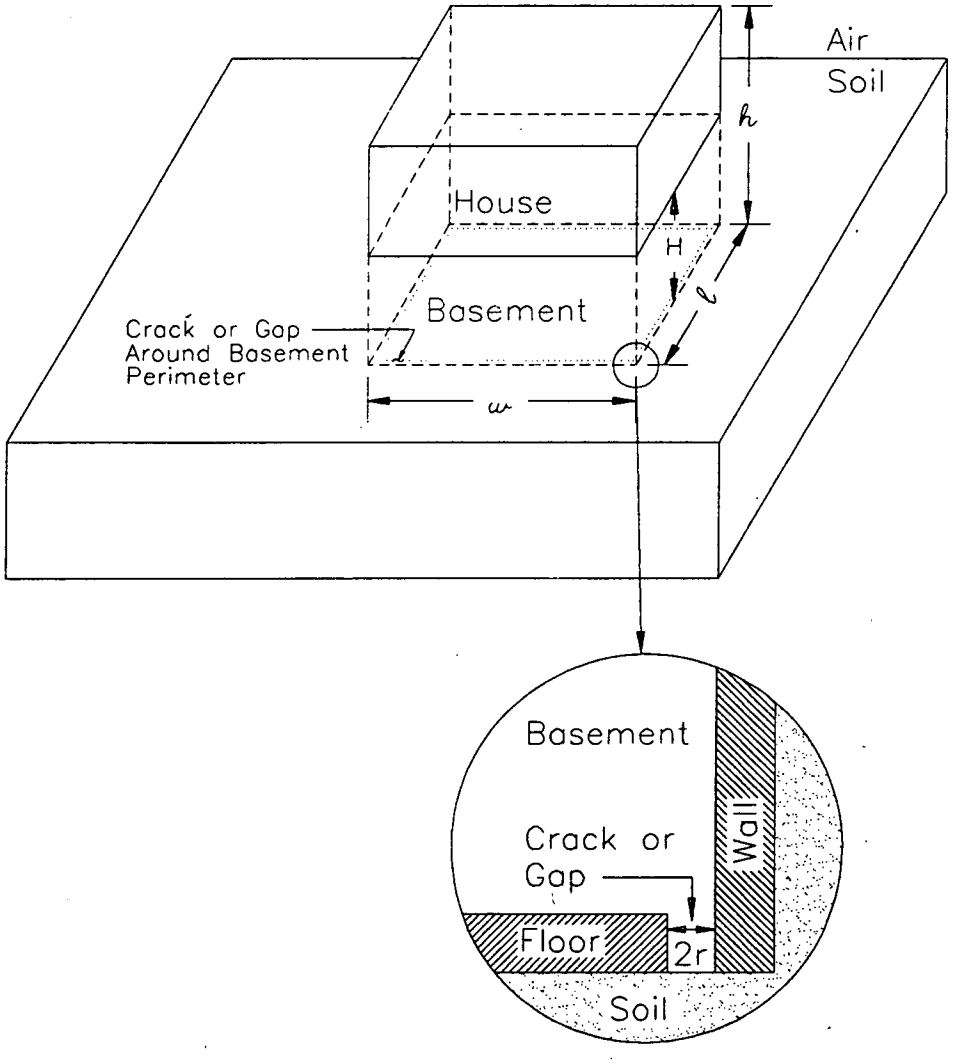

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FIGURE 1
INDOOR RADON STUDY: TYPICAL HOUSE WITH SUBGRADE BASEMENT

The weather-induced pressure difference developed in homes with basements is typically 1 to 10 Pa (Sextro 1993; Nazaroff et al. 1987; Johnson and Ettinger 1991). Based on this pressure difference, the majority of radon available for transport into the basement lies within approximately 1 meter of the basement floor for soils with moderate-to-low intrinsic permeabilities (Sextro, 1993). The soils in the South Field area can typically be classified as silty loam or silty clay loam (Mulder 1993), which have relatively low intrinsic permeabilities (Kunz 1988). As a result, the first, third, sixth, seventh, and eighth assumptions listed above are valid and provide reasonable results.

The second assumption will provides reasonable-to-conservative (high) results. The fourth assumption may provide high or low estimates, depending on the assumed gap width. The ninth assumption provides reasonable results for a risk assessment, provided that the occupants move about the house and do not spend more than 50 percent of their time in the basement, where elevated levels of radon can occur (Nazaroff et al. 1987). The fifth, tenth and eleventh assumptions tend to provide conservative results by overestimating the total quantity of radon gas available for migration into the basement.

Sextro (1993) has indicated that the assumptions made to develop the analytical model limit its applicability to subgrade floors that are typically 1.5 to 3 meters below the soil surface. This model would not be applicable to slab-on-grade buildings.

Site-specific soil parameters for the South Field were used develop indoor radon concentration estimates. These parameters are presented in Table 1.

Table 1
South Field Soil Parameters

Parameter	Surface Soil (0 to 6")	Subsurface Soil (Below 6")
C^{Ra}_s, pCi/g	30.8	2.919
ρ, g/cm^3	1.7	1.85
n	0.52	0.41
Moisture Content		
Wt%	18.2	20.0
Vol%	31.0	37.0

Source: Garland 1993.

Since the subgrade basement screening model is applicable for basement depths of 1.5 to 3 meters and the effective distance in soil for radon transportation to a basement crack or gap is approximately 1 meter, the surface soil radium concentration is not expected to contribute substantially to radon flow into the basement opening (Sextro 1993). Therefore, the subsurface soil parameters were be used to estimate indoor radon concentrations from subsurface migration of soil gas into basements. Note that the scope of this analysis does not consider above-grade radon or radium transport into the house through open windows or doors.

Two sets of house parameters were analyzed for the subgrade basement model. The first set was taken directly from the Operable Unit 1 Baseline Risk Assessment (DOE 1993) and was used to provide a consistent set of parameters between the operable unit risk assessments. The second set was developed from typical house parameters available in literature for single story houses with basements (Nazaroff et al. 1987; Nazaroff and Sextro 1989; Loureiro et al. 1990; Johnson and Ettinger 1991; and Bruno 1983). The air exchange rate for both houses was assumed to be 0.1 air changes per hour, which is typical for new, tightly constructed homes (Bruno 1983). The house parameters are presented in Table 2.

Table 2
House Parameters for Indoor Radon Analysis

Parameter	House with Basement	OU1 RI Parameters
l, meters	12	20
w, meters	10	10
h, meters	2.33 (per floor)	3
q, 1/hr	0.1	0.1
L, meters	44	60
V, m^3	560	600
Qv, m^3/s	0.0156	0.0167
2r, mm	1	1

Sources: DOE 1993; Nazaroff et al. 1987; Nazaroff and Sextro 1989; Loureiro et al. 1990; Johnson and Ettinger 1991; and Bruno 1983.

RAETRAD Version 3.1

The RAETRAD model computes radon production from radium decay, radon interactions in the solid, liquid, and gas phases of soils and concretes, and radon gas transport and indoor entry by both diffusion (concentration-driven) and advection (with pressure-driven air flow). It solves LaPlace's equation in steady state to define air pressure distributions under and near the house and to obtain air-flow velocities

used in the radon calculations. The radon differential equation also is solved in steady state, and incorporates the air velocity field in computing simultaneous diffusive and advective radon transport. The equations are solved numerically in elliptical-cylindrical geometry to represent houses of different size and with varying rectangular aspect (length/width) ratios. Radon entry rates into a house are computed by integrating the total radon transport across the floor surface area. Indoor radon concentrations are also estimated from the computed entry rates divided by the house volume and its air ventilation rate (Nielson et al. 1993a).

As currently developed, RAETRAD specifically addresses slab-on-grade buildings. The underlying equations are such that extension of the program to subgrade floors (ie., basements) can be developed (Rogers 1993). The model can calculate radon diffusion and transport through various soil layers, building foundation materials, and building slab penetrations (cracks, drains, etc.). The model has been validated for slab-on-grade buildings (Nielson, et al., 1993a).

Because RAETRAD can address multiple soil layers, the surface and subsurface soil parameters were used in this analysis. The house and soil configuration is shown in Figure 2.

Study Results

The results of the Nazaroff-Sextro model are presented in Attachment 1, and the model input and RAETRAD model results are presented in Attachment 2. The estimated indoor radon concentration for each case is summarized in Table 3.

Table 3
Estimated Indoor Rn-222 Concentrations, pCi/l

Model	House with Basement		Slab on Grade House
	Typical	OU1 RI	
Nazaroff-Sextro	0.0008	0.001	13.0[a]
RAETRAD	—	—	17.3

[a]For comparison only. RAETRAD is the preferred model for slab-on-grade houses.a For comparison only.

The slab-on-grade house provides the worst-case results with indoor radon concentrations significantly higher than the EPA-recommended action level of 4 pCi/l.

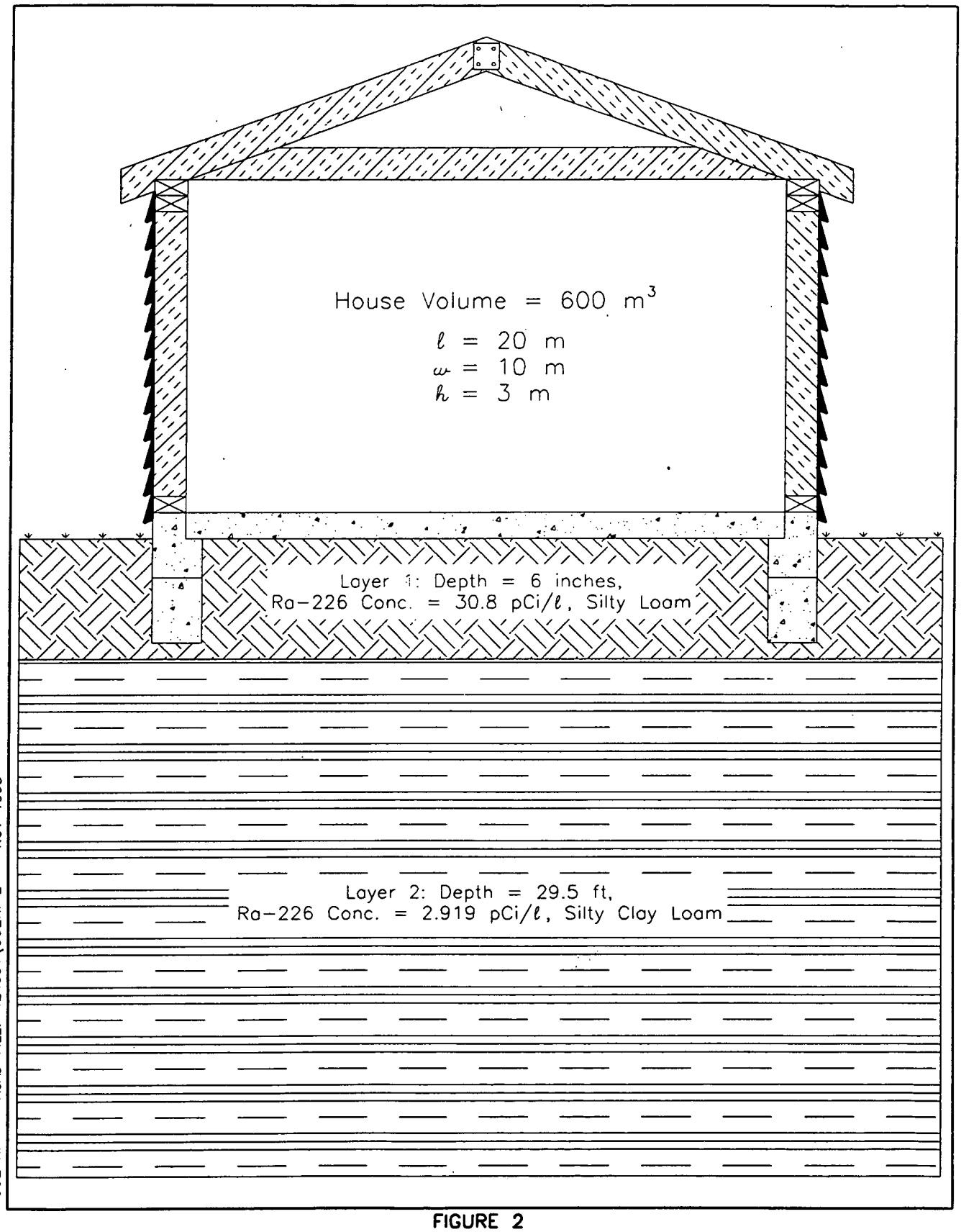

FIGURE 2
INDOOR RADON STUDY: SLAB-ON-GRADE HOUSE BUILT ON SOUTH FIELD

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Results for the subgrade basement configuration are approximately four orders of magnitude below the slab-on-grade results. This difference is attributed to the difference in intrinsic permeability of the surface soil and subsurface soil. The subsurface soil is substantially less permeable than the surface soil; therefore, gas migration into a subgrade basement occurs more slowly than migration into the slab-on-grade house. The relationship between the intrinsic permeability, pressure difference, and indoor radon concentration is presented in Figure 3.

The Nazaroff-Sextro model was originally developed only for houses with below-grade basements. However, comparing results for the this model to the RAETRAD model for slab-on-grade construction indicates relatively good agreement between the models. Therefore, the Nazaroff-Sextro model is expected to provide reasonable results for subgrade basement configurations.

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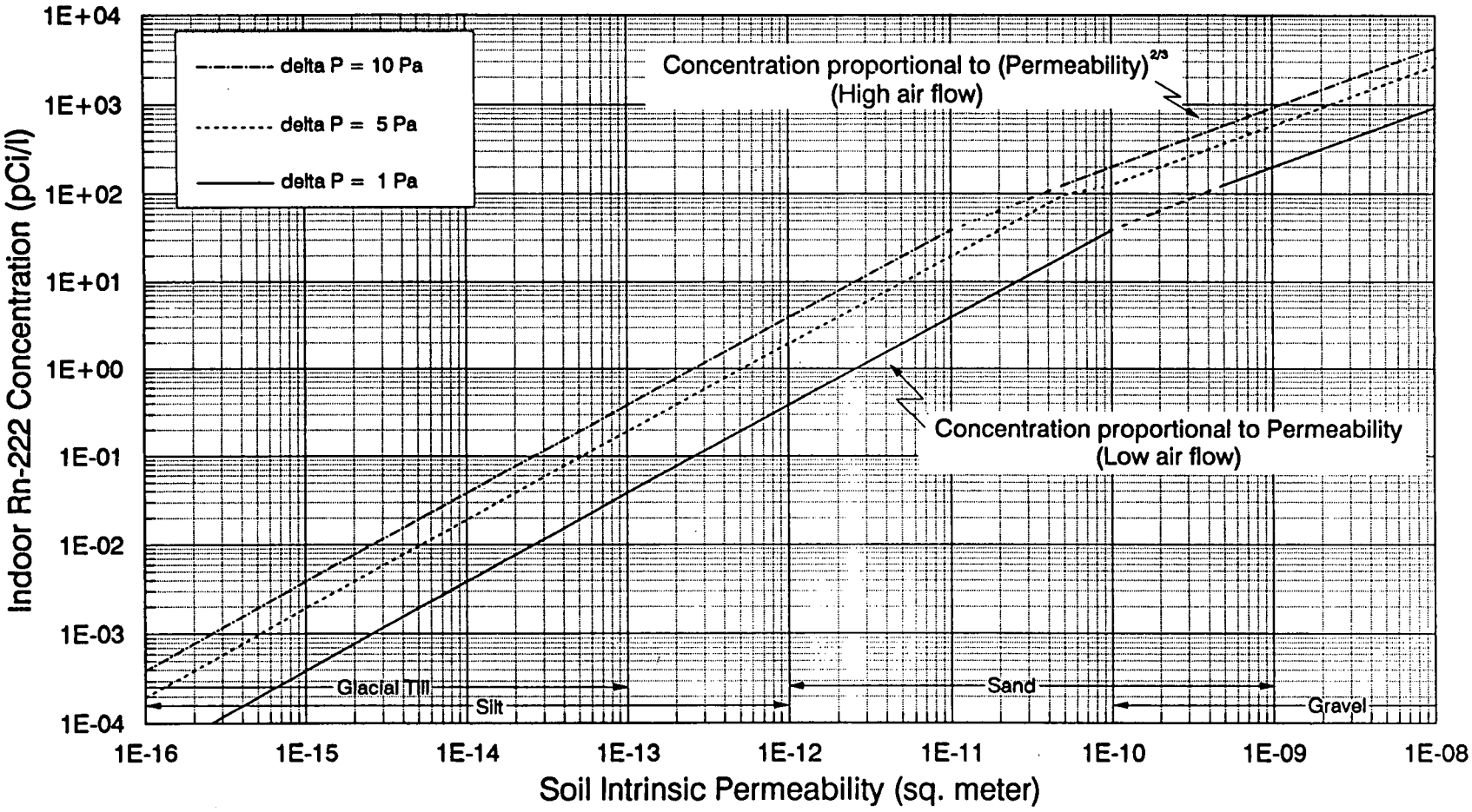
Figure 3

Indoor Radon Concentration vs Soil Permeability for Various Pressure Differentials



House Volume = 600 cu. meters
Basement Perimeter = 60 meters; Depth = 2 meters
Air Exchange Rate = 0.1 1/hr

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ATTACHMENT 1

NAZAROFF-SEXTRO MODEL RESULTS

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INDOOR RADON CALCULATION METHOD*

Site-Specific Soil Parameters (Subsurface)
Typical Building Dimensions
Basement Elevation @ 2 m below grade

	Constants:	
E =	Rn emanation coefficient	0.2
Lambda =	Rn-222 decay constant	2.10E-06 1/s
u =	Dynamic viscosity of air in soil pores (@ 20°C)	1.70E-05 kg/ms
	Variables:	
Rho_s =	Density of the soil solid phase = bulk density / (1 - n)	3.14 g/cm^3
C_s^{Ra} =	Ra-226 Concentration in soil, (pCi/g)	2.919 pCi/g
n =	Soil porosity	0.41
DelP =	Dynamic pressure difference between soil surface and basement	5 kg/ms^2
k =	Intrinsic permeability of the soil **	5.11E-16 m^2 (silty loam)
H =	Depth of basement floor below soil surface	2 m
r =	Half-width of crack or gap in basement floor	0.0005 m
l=	Length of building	12 m
w=	Width of building	10 m
h =	Height of building (Note: h >= H)	4.6667 m
q =	Building air exchange rate (building volumes/hr)	0.1 1/h
	Calculations:	
G =	Rn-222 release rate into soil pore spaces	
G =	E Rho (C_s^{Ra}) Lambda ((1-n)/n) 10^6	5.540 (pCi/m^{3}s)
K_1 =	Determines which case to analyze in the F equation	
K_1 =	DelP k	2.56E-15
K_2 =	Determines which case to analyze in the F equation	
K_2 =	0.5 n u Lambda H^2 ln (2H/r)	2.63E-10
F =	Rn-222 source term from soil gas, 2 cases: F_{low} or F_{hi}	
F_{low} =	1. Low air flow into basement, F_{low}, if $K_1 <= K_2$	
F_{low} =	(2 Pi G L DelP k)/[u Lambda (ln(2H/r))]	1.22E-02 (pCi/s)
F_{hi} =	2. High air flow into basement, F_{hi}, if $K_1 > K_2$	
F_{hi} =	(4.0) G L H$^{2/3}$n$^{1/3}$ [(DelP k) / (u Lambda ln(2H/r))]$^{2/3}$	NA (pCi/s)
L =	perimeter of basement floor (2l+2w)	44 (m)
V =	Volume of building (l w h)	560.00 (m^3)
Qv =	Exchange air flow rate (q V)/3600	1.56E-02 (m^3/s)
C_i^{Rn} =	Indoor radon concentration from soil gas source	
C_i^{Rn} =	F/Qv	7.84E-01 (pCi/m^3)
		7.84E-04 (pCi/l)

* Source: Nazaroff, W.W. and R.G. Sextro, "Technique for Measuring the Indoor ^{222}Rn Source Potential of Soil,". Environmental Science and Technology, V. 23, No. 4, pp. 451-458 (Apr 1989).
** Source: Nielsen, K.K., V. Rogers, and V.C. Rogers, "RAETRAD Version 3.1 User Manual," RAE-9127/10-2, U.S. Environmental Protection Agency, Air and Energy Engineering Research Laboratory, Research Triangle Park (Oct 1992). RAETRAD Model used to calculate permeability from moisture, porosity, and effective particle size.

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SF-1

INDOOR RADON CALCULATION METHOD*

Site-Specific Soil Parameters (Subsurface)
OU1 RI Building Dimensions
Basement Elevation @ 2 m below grade

	Constants:	
E =	Rn emanation coefficient	0.2
Lambda =	Rn-222 decay constant	2.10E-06 1/s
u =	Dynamic viscosity of air in soil pores (@ 20°C)	1.70E-05 kg/ms
	Variables:	
Rho_s =	Density of the soil solid phase = bulk density / (1 - n)	3.14 g/cm^3
C_s^{Ra} =	Ra-226 Concentration in soil, (pCi/g)	2.919 pCi/g
n =	Soil porosity	0.41
DelP =	Dynamic pressure difference between soil surface and basement	5 kg/ms^2
k =	Intrinsic permeability of the soil **	5.11E-16 m^2 (silty loam)
H =	Depth of basement floor below soil surface	2 m
r =	Half-width of crack or gap in basement floor	0.0005 m
l=	Length of building	20 m
w=	Width of building	10 m
h =	Height of building (Note: h >= H)	3 m
q =	Building air exchange rate (building volumes/hr)	0.1 1/h
	Calculations:	
G =	Rn-222 release rate into soil pore spaces	
G =	E Rho (C_s^{Ra}) Lambda ((1-n)/n) 10^6	5.540 (pCi/m^{3}s)
K_1 =	Determines which case to analyze in the F equation	
K_1 =	DelP k	2.56E-15
K_2 =	Determines which case to analyze in the F equation	
K_2 =	0.5 n u Lambda H^2 ln (2H/r)	2.63E-10
F =	Rn-222 source term from soil gas, 2 cases: F_{low} or F_{hi}	
F_{low} =	1. Low air flow into basement, F_{low}, if $K_1 <= K_2$	
F_{low} =	(2 Pi G L DelP k)/[u Lambda (ln(2H/r))]	1.66E-02 (pCi/s)
F_{hi} =	2. High air flow into basement, F_{hi}, if $K_1 > K_2$	
F_{hi} =	(4.0) G L $H^{2/3} n^{1/3}$ [(DelP k) / (u Lambda ln(2H/r)]$^{2/3}$	NA (pCi/s)
L =	perimeter of basement floor (2l+2w)	60 (m)
V =	Volume of building (l w h)	600.00 (m^3)
Qv =	Exchange air flow rate (q V)/3600	1.67E-02 (m^3/s)
C_i^{Rn} =	Indoor radon concentration from soil gas source	
C_i^{Rn} =	F/Qv	9.98E-01 (pCi/m^3)
		9.98E-04 (pCi/l)

* Source: Nazaroff, W.W. and R.G. Sextro, "Technique for Measuring the Indoor ^{222}Rn Source Potential of Soil,". Environmental Science and Technology, V. 23, No. 4, pp. 451-458 (Apr 1989).
** Source: Nielsen, K.K., V. Rogers, and V.C. Rogers, "RAETRAD Version 3.1 User Manual," RAE-9127/10-2, U.S. Environmental Protection Agency, Air and Energy Engineering Research Laboratory, Research Triangle Park (Oct 1992). RAETRAD Model used to calculate permeability from moisture, porosity, and effective particle size.

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INDOOR RADON CALCULATION METHOD*

Site-Specific Soil Parameters (Surface)
OU1 RI Building Dimensions
Slab-on-grade

	Constants:	
E =	Rn emanation coefficient	0.2
Lambda =	Rn-222 decay constant	2.10E-06 1/s
u =	Dynamic viscosity of air in soil pores (@ 20°C)	1.70E-05 kg/ms
	Variables:	
Rho_s =	Density of the soil solid phase = bulk density / (1 - n)	3.54 g/cm^3
C_s^{Ra} =	Ra-226 Concentration in soil, (pCi/g)	30.8 pCi/g
n =	Soil porosity	0.52
DelP =	Dynamic pressure difference between soil surface and basement	5 kg/ms^2
k =	Intrinsic permeability of the soil **	1.32E-12 m^2 (silty loam)
H =	Depth of basement floor below soil surface	0.15 m
r =	Half-width of crack or gap in basement floor	0.0005 m
l=	Length of building	20 m
w=	Width of building	10 m
h =	Height of building (Note: h >= H)	3 m
q =	Building air exchange rate (building volumes/hr)	0.1 1/h
	Calculations:	
G =	Rn-222 release rate into soil pore spaces	
G =	E Rho (C_s^{Ra}) Lambda ((1-n)/n) 10^6	42.271 (pCi/m^{3}s)
K_1 =	Determines which case to analyze in the F equation	
K_1 =	DelP k	6.60E-12
K_2 =	Determines which case to analyze in the F equation	
K_2 =	0.5 n u Lambda H^2 ln (2H/r)	1.34E-12
F =	Rn-222 source term from soil gas, 2 cases: F_{low} or F_{hi}	
F_{low} =	1. Low air flow into basement, F_{low}, if $K_1 <= K_2$	
F_{low} =	(2 Pi G L DelP k)/[u Lambda (ln(2H/r))]	NA (pCi/s)
F_{hi} =	2. High air flow into basement, F_{hi}, if $K_1 > K_2$	
F_{hi} =	(4.0) G L H$^{2/3}$n$^{1/3}$ [(DelP k) / (u Lambda ln(2H/r)]$^{2/3}$	2.17E+02 (pCi/s)
L =	perimeter of basement floor (2l+2w)	60 (m)
V =	Volume of building (l w h)	600.00 (m^3)
Qv =	Exchange air flow rate (q V)/3600	1.67E-02 (m^3/s)
C_i^{Rn} =	Indoor radon concentration from soil gas source	
C_i^{Rn} =	F/Qv	1.30E+04 (pCi/m^3)
		1.30E+01 (pCi/l)

* Source: Nazaroff, W.W. and R.G. Sextro, "Technique for Measuring the Indoor ^{222}Rn Source Potential of Soil,". Environmental Science and Technology, V. 23, No. 4, pp. 451-458 (Apr 1989).
** Source: Nielsen, K.K., V. Rogers, and V.C. Rogers, "RAETRAD Version 3.1 User Manual," RAE-9127/10-2, U.S. Environmental Protection Agency, Air and Energy Engineering Research Laboratory, Research Triangle Park (Oct 1992). RAETRAD Model used to calculate permeability from moisture, porosity, and effective particle size.

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SF-3

INDOOR RADON CALCULATION METHOD*

Site-Specific Soil Parameters (Subsurface)
Typical Building Dimensions
Basement Elevation @ 2 m below grade

	Constants:	
E =	Rn emanation coefficient	0.2
Lambda =	Rn-222 decay constant	2.10E-06 1/s
u =	Dynamic viscosity of air in soil pores (@ 20°C)	1.70E-05 kg/ms
	Variables:	
Rho_s =	Density of the soil solid phase = bulk density / (1 - n)	3.2 g/cm^3
C_s^{Ra} =	Ra-226 Concentration in soil, (pCi/g)	1.55 pCi/g
n =	Soil porosity	0.41
DelP =	Dynamic pressure difference between soil surface and basement	5 kg/ms^2
k =	Intrinsic permeability of the soil **	9.66E-13 m^2 (silty loam)
H =	Depth of basement floor below soil surface	2 m
r =	Half-width of crack or gap in basement floor	0.0005 m
l=	Length of building	12 m
w=	Width of building	10 m
h =	Height of building (Note: h >= H)	4.6667 m
q =	Building air exchange rate (building volumes/hr)	0.1 1/h
	Calculations:	
G =	Rn-222 release rate into soil pore spaces	
G =	E Rho (C_s^{Ra}) Lambda ((1-n)/n) 10^6	2.998 (pCi/m^3s)
K_1 =	Determines which case to analyze in the F equation	
K_1 =	DelP k	4.83E-12
K_2 =	Determines which case to analyze in the F equation	
K_2 =	0.5 n u Lambda H^2 ln (2H/r)	2.63E-10
F =	Rn-222 source term from soil gas, 2 cases: F_{low} or F_{hi}	
F_{low} =	1. Low air flow into basement, F_{low}, if $K_1 <= K_2$	
F_{low} =	(2 Pi G L DelP k)/[u Lambda (ln(2H/r))]	1.25E+01 (pCi/s)
F_{hi} =	2. High air flow into basement, F_{hi}, if $K_1 > K_2$	
F_{hi} =	(4.0) G L $H^{2/3} n^{1/3}$ [(DelP k) / (u Lambda ln(2H/r)]$^{2/3}$	NA (pCi/s)
L =	perimeter of basement floor (2l+2w)	44 (m)
V =	Volume of building (l w h)	560.00 (m^3)
Qv =	Exchange air flow rate (q V)/3600	1.56E-02 (m^3/s)
C_i^{Rn} =	Indoor radon concentration from soil gas source	
C_i^{Rn} =	F/Qv	8.02E+02 (pCi/m^3)
		8.02E-01 (pCi/l)

* Source: Nazaroff, W.W. and R.G. Sextro, "Technique for Measuring the Indoor ^{222}Rn Source Potential of Soil,". Environmental Science and Technology, V. 23, No. 4, pp. 451-458 (Apr 1989).
** Source: Nielsen, K.K., V. Rogers, and V.C. Rogers, "RAETRAD Version 3.1 User Manual," RAE-9127/10-2, U.S. Environmental Protection Agency, Air and Energy Engineering Research Laboratory, Research Triangle Park (Oct 1992). RAETRAD Model used to calculate permeability from moisture, porosity, and effective particle size.

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INDOOR RADON CALCULATION METHOD*

Site-Specific Soil Parameters (Subsurface)
OU1 RI Building Dimensions
Basement Elevation @ 2 m below grade

	Constants:	
E =	Rn emanation coefficient	0.2
Lambda =	Rn-222 decay constant	2.10E-06 1/s
u =	Dynamic viscosity of air in soil pores (@ 20°C)	1.70E-05 kg/ms
	Variables:	
Rho_s =	Density of the soil solid phase = bulk density / (1 - n)	3.2 g/cm^3
C_s^{Ra} =	Ra-226 Concentration in soil, (pCi/g)	1.55 pCi/g
n =	Soil porosity	0.41
DelP =	Dynamic pressure difference between soil surface and basement	5 kg/ms^2
k =	Intrinsic permeability of the soil **	9.66E-13 m^2 (silty loam)
H =	Depth of basement floor below soil surface	2 m
r =	Half-width of crack or gap in basement floor	0.0005 m
l=	Length of building	20 m
w=	Width of building	10 m
h =	Height of building (Note: h >= H)	3 m
q =	Building air exchange rate (building volumes/hr)	0.1 1/h
	Calculations:	
G =	Rn-222 release rate into soil pore spaces	
G =	E Rho (C_s^{Ra}) Lambda ((1-n)/n) 10^6	2.998 (pCi/m^{3}s)
K_1 =	Determines which case to analyze in the F equation	
K_1 =	DelP k	4.83E-12
K_2 =	Determines which case to analyze in the F equation	
K_2 =	0.5 n u Lambda H^2 ln (2H/r)	2.63E-10
F =	Rn-222 source term from soil gas, 2 cases: F_{low} or F_{hi}	
F_{low} =	1. Low air flow into basement, F_{low}, if $K_1 <= K_2$	
F_{low} =	(2 Pi G L DelP k)/[u Lambda (ln(2H/r))]	1.70E+01 (pCi/s)
F_{hi} =	2. High air flow into basement, F_{hi}, if $K_1 > K_2$	
F_{hi} =	(4.0) G L H$^{2/3}$n$^{1/3}$ [(DelP k) / (u Lambda ln(2H/r)]$^{2/3}$	NA (pCi/s)
L =	perimeter of basement floor (2l+2w)	60 (m)
V =	Volume of building (l w h)	600.00 (m^3)
Qv =	Exchange air flow rate (q V)/3600	1.67E-02 (m^3/s)
C_i^{Rn} =	Indoor radon concentration from soil gas source	
C_i^{Rn} =	F/Qv	1.02E+03 (pCi/m^3)
		1.02E+00 (pCi/l)

* Source: Nazaroff, W.W. and R.G. Sextro, "Technique for Measuring the Indoor ^{222}Rn Source Potential of Soil,". Environmental Science and Technology, V. 23, No. 4, pp. 451-458 (Apr 1989).

** Source: Nielsen, K.K., V. Rogers, and V.C. Rogers, "RAETRAD Version 3.1 User Manual," RAE-9127/10-2, U.S. Environmental Protection Agency, Air and Energy Engineering Research Laboratory, Research Triangle Park (Oct 1992). RAETRAD Model used to calculate permeability from moisture, porosity, and effective particle size.

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SWL-2

INDOOR RADON CALCULATION METHOD*

Site-Specific Soil Parameters (Surface)
OU1 RI Building Dimensions
Slab-on-grade

Constants:

E =	Rn emanation coefficient	0.2
Lambda =	Rn-222 decay constant	2.10E-06 1/s
u =	Dynamic viscosity of air in soil pores (@ 20°C)	1.70E-05 kg/ms

Variables:

Rho_s =	Density of the soil solid phase = bulk density / (1 − n)	3.81 g/cm³
C_s^{Ra} =	Ra-226 Concentration in soil, (pCi/g)	1.397 pCi/g
n =	Soil porosity	0.52
DelP =	Dynamic pressure difference between soil surface and basement	5 kg/ms²
k =	Intrinsic permeability of the soil **	6.30E-13 m² (silty loam)
H =	Depth of basement floor below soil surface	0.15 m
r =	Half-width of crack or gap in basement floor	0.0005 m
l=	Length of building	20 m
w=	Width of building	10 m
h =	Height of building (Note: h >= H)	3 m
q =	Building air exchange rate (building volumes/hr)	0.1 1/h

Calculations:

G =	Rn-222 release rate into soil pore spaces	
G =	E Rho (C_s^{Ra}) Lambda ((1−n)/n) 10^6	2.064 (pCi/m³s)
K_1 =	Determines which case to analyze in the F equation	
K_1 =	DelP k	3.15E-12
K_2 =	Determines which case to analyze in the F equation	
K_2 =	0.5 n u Lambda H^2 ln (2H/r)	1.34E-12
F =	Rn-222 source term from soil gas, 2 cases: F_{low} or F_{hi}	
F_{low} =	1. Low air flow into basement, F_{low}, if $K_1 <= K_2$	
F_{low} =	(2 Pi G L DelP k)/[u Lambda (ln(2H/r))]	NA (pCi/s)
F_{hi} =	2. High air flow into basement, F_{hi}, if $K_1 > K_2$	
F_{hi} =	(4.0) G L $H^{2/3} n^{1/3}$ [(DelP k) / (u Lambda ln(2H/r)]$^{2/3}$	6.47E+00 (pCi/s)
L =	perimeter of basement floor (2l+2w)	60 (m)
V =	Volume of building (l w h)	600.00 (m³)
Qv =	Exchange air flow rate (q V)/3600	1.67E-02 (m³/s)
C_i^{Rn} =	Indoor radon concentration from soil gas source	
C_i^{Rn} =	F/Qv	3.88E+02 (pCi/m³)
		3.88E-01 (pCi/l)

* Source: Nazaroff, W.W. and R.G. Sextro, "Technique for Measuring the Indoor ^{222}Rn Source Potential of Soil,". Environmental Science and Technology, V. 23, No. 4, pp. 451-458 (Apr 1989).
** Source: Nielsen, K.K., V. Rogers, and V.C. Rogers, "RAETRAD Version 3.1 User Manual," RAE-9127/10-2, U.S. Environmental Protection Agency, Air and Energy Engineering Research Laboratory, Research Triangle Park (Oct 1992). RAETRAD Model used to calculate permeability from moisture, porosity, and effective particle size.

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SWL-3

6507

ATTACHMENT 2

RAETRAD MODEL RESULTS

000534

SCENARIO TITLE: OU2 RI: RUN 01, SITE-SPECIFIC SOIL DATA, DEFAULT BUILDING PARAMETERS — RAETRAD v3.0
FILE NAME: OU2RI010 — RAdon Emanation and TRAnsport into Dwellings
RUN DATE: 10/21/1993 @ 11:23 — developed by Rogers & Associates Engineering Corporation

==========: INPUT PARAMETERS :==========

HOUSE:

Dimensions	: 32.8 x 65.6 ft.	Equiv. ellipse radius	: 19 ft.	Outdoor Pressure	: .00 Pa
Area	: 2152 sq. ft.	Aspect ratio	: 2.000	Indoor Rn Bnd.	: .00 pCi/L
Fill thickness	: 0 units (.0ft.)	Circumference	: 238.8 ft.	Outdoor Rn Bnd.	: .00 pCi/L
Footing depth	: 1 units (.3ft.)	Indoor pressure	: -5.0 Pa.	Radial Mesh Units	: 1.00 ft.

FLOOR OPENINGS:

Crack or Penetration Type	Number of Penetrations	Loc. Frm Permtr ft	Local Pressure Pa	Local Rn Bndry pCi/L	Radial Width cm	Arc Length cm	Porosity	Perm. cm2	Diff. cm2/s
Elliptical Crack		1.000	-5.00	.00	.10	5603.56	.600	1.00E-04	6.00E-02

FOUNDATION & SOILS:

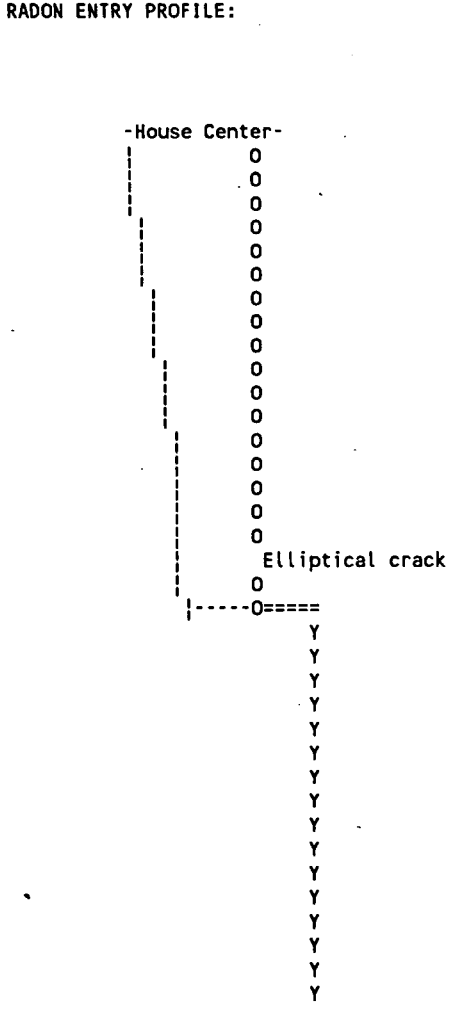
Lyr No.	Thickness ft	Vrt. Div.	Ra226 pCi/g	Dens. g/cm3	Eman. frac.	Tot. Poros	Sat'n frac.	P.Diam cm	Diff.Rad cm2/s	Diff.Ver cm2/s	Perm.Rad cm2	Perm.Ver cm2	Kads cc/g	Material
FLR	.500	1	.0	2.100	.000	.222	.769	.000290	6.29E-04	6.29E-04	1.23E-12	1.23E-12	.000	Conc1
1	.500	2	30.8	1.700	.200	.520	.596	.011400	7.90E-03	7.90E-03	1.32E-08	1.32E-08	.001	SiLom
2	29.500	29	2.9	1.850	.200	.410	.902	.005600	1.81E-04	1.81E-04	5.11E-12	5.11E-12	.000	SiCLm
FTG	.250	1	.0	2.100	.000	.222	.769	.000290	6.29E-04	6.29E-04	1.23E-12	1.23E-12	.000	Conc1

SCENARIO TITLE: OU2 RI: RUN 01, SITE-SPECIFIC SOIL DATA, DEFAULT BUILDING PARAMETERS
FILE NAME: OU2RI010

RAETRAD v3.0
RAdon Emanation and TRAnsport into Dwellings
developed by Rogers & Associates Engineering Corporation

==========: ANALYSIS RESULTS :==========

RADON ENTRY PROFILE:



	Radial Positn ft	Air Entry Rate cfm	Average Radon Flux pCi/m2s	Radon Entry Rate pCi/s
	1.00	4.00E-08	9.14E-02	5.74E-01
	2.00	1.20E-07	9.14E-02	1.72E+00
	3.00	2.00E-07	9.14E-02	2.87E+00
	4.00	2.80E-07	9.14E-02	4.02E+00
	5.00	3.61E-07	9.14E-02	5.17E+00
	6.00	4.41E-07	9.14E-02	6.32E+00
	7.00	5.21E-07	9.14E-02	7.46E+00
	8.00	6.02E-07	9.13E-02	8.61E+00
	9.00	6.82E-07	9.13E-02	9.75E+00
	10.00	7.63E-07	9.12E-02	1.09E+01
	11.00	8.44E-07	9.10E-02	1.20E+01
	12.00	9.24E-07	9.06E-02	1.31E+01
	13.00	1.01E-06	9.01E-02	1.41E+01
	14.00	1.09E-06	8.91E-02	1.51E+01
	15.00	1.17E-06	8.73E-02	1.59E+01
	16.00	1.25E-06	8.43E-02	1.64E+01
	17.00	1.32E-06	7.90E-02	1.64E+01
	18.00	1.03E-02	4.97E-01	1.09E+02
	19.00	3.61E-06	5.86E-02	1.36E+01
	20.00	4.69E-06	2.23E-02	5.47E+00
INDOOR TOTAL		1.03E-02	1.25E-02	2.89E+02
	21.00	-9.58E-03	6.71E-01	1.73E+02
	22.00	-1.22E-03	4.18E-01	1.13E+02
	23.00	-1.57E-04	3.88E-01	1.10E+02
	24.00	-2.12E-05	3.84E-01	1.14E+02
	25.00	-3.69E-06	3.84E-01	1.18E+02
	26.00	-1.33E-06	3.84E-01	1.23E+02
	27.00	-9.27E-07	3.84E-01	1.28E+02
	28.00	-8.05E-07	3.84E-01	1.33E+02
	29.00	-7.36E-07	3.84E-01	1.37E+02
	30.00	-6.86E-07	3.84E-01	1.42E+02
	31.00	-6.49E-07	3.84E-01	1.47E+02
	32.00	-6.21E-07	3.84E-01	1.52E+02
	33.00	-6.00E-07	3.84E-01	1.57E+02
	34.00	-5.85E-07	3.84E-01	1.62E+02

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Y	35.00	-5.76E-07	3.84E-01	1.66E+02
Y	36.00	-5.71E-07	3.84E-01	1.71E+02
Y	37.00	-5.70E-07	3.84E-01	1.76E+02
Y	38.00	-5.73E-07	3.84E-01	1.81E+02
Y	39.00	-5.80E-07	3.84E-01	1.86E+02
Y	40.00	-5.91E-07	3.84E-01	1.91E+02

INDOOR RADON : 17.346 pCi/L (assuming .10 ach & 9.84 ft Height)

CPU Calc. Time: 279.00 seconds

0005332

SCENARIO TITLE: OU2 RI: RUN 01, SITE-SPECIFIC SOIL DATA, DEFAULT BUILDING PARAMETERS
FILE NAME: OU2RI010

RAETRAD v3.0
RAdon Emanation and TRAnsport into Dwellings
developed by Rogers & Associates Engineering Corporation

Suction Pressures, (- .0010 Pa) depth (ft.)----->

	.0	.5	.8	1.0	2.0	3.0	4.1	5.1	6.1	7.1	8.1	9.1	10.2	11.2	12.2	13.2	14.2	15.2	16.3	17.3	18.3	19.3	20.3	21.3	22.4
1	4264	4264	4264	4094	3925	3759	3598	3442	3293	3151	3017	2892	2775	2667	2567	2476	2393	2318	2251	2191	2138	2092	2052	2018	1991
2	4264	4264	4264	4093	3923	3756	3594	3438	3288	3146	3012	2887	2770	2662	2562	2471	2388	2314	2247	2187	2134	2088	2048	2015	1987
3	4264	4264	4264	4091	3919	3751	3588	3430	3280	3137	3002	2877	2760	2652	2552	2461	2379	2305	2238	2178	2126	2080	2041	2008	1980
4	4264	4264	4264	4088	3914	3743	3577	3418	3266	3122	2987	2861	2744	2636	2537	2447	2365	2291	2225	2166	2114	2069	2030	1997	1970
5	4264	4264	4264	4084	3906	3732	3563	3401	3248	3102	2966	2840	2723	2615	2517	2427	2346	2273	2207	2149	2098	2054	2015	1983	1957
6	4264	4264	4263	4078	3896	3717	3545	3380	3224	3077	2940	2813	2696	2589	2491	2402	2322	2250	2186	2129	2079	2035	1997	1966	1940
7	4263	4263	4263	4072	3883	3699	3521	3353	3194	3045	2907	2780	2663	2557	2460	2372	2294	2223	2160	2104	2055	2012	1976	1945	1920
8	4263	4263	4263	4063	3866	3675	3492	3319	3157	3007	2868	2741	2624	2519	2423	2337	2260	2191	2130	2075	2028	1986	1951	1921	1897
9	4263	4263	4262	4052	3846	3646	3457	3279	3113	2961	2821	2694	2579	2475	2381	2297	2222	2155	2095	2043	1997	1957	1923	1895	1871
10	4262	4262	4262	4039	3820	3611	3413	3229	3060	2906	2766	2640	2526	2424	2333	2251	2178	2114	2057	2006	1962	1924	1892	1865	1843
11	4262	4262	4262	4022	3788	3566	3359	3170	2997	2842	2702	2577	2466	2367	2278	2200	2130	2068	2014	1966	1925	1889	1858	1832	1811
12	4261	4261	4261	4000	3747	3510	3293	3097	2922	2766	2628	2506	2398	2302	2218	2143	2077	2019	1968	1923	1884	1850	1821	1797	1778
13	4261	4261	4261	3971	3694	3439	3211	3009	2832	2678	2543	2425	2322	2231	2152	2081	2020	1965	1918	1876	1840	1809	1782	1760	1742
14	4260	4260	4260	3931	3623	3347	3108	2902	2726	2576	2446	2335	2238	2153	2080	2015	1958	1908	1865	1827	1794	1765	1741	1721	1704
15	4260	4260	4260	3873	3524	3226	2978	2772	2601	2458	2338	2234	2146	2069	2002	1944	1893	1848	1809	1775	1745	1720	1698	1680	1665
16	4260	4260	4259	3783	3382	3064	2813	2615	2456	2325	2217	2125	2046	1979	1920	1869	1824	1785	1751	1721	1695	1672	1653	1638	1625
17	4264	4264	4257	3627	3169	2844	2607	2429	2289	2177	2085	2007	1941	1884	1834	1791	1753	1720	1691	1665	1643	1624	1608	1594	1583
18	4632	4380	4211	3315	2839	2549	2354	2212	2103	2016	1943	1882	1830	1785	1745	1710	1680	1653	1629	1608	1590	1574	1561	1550	1541
19	3208	3208	3134	2624	2346	2176	2059	1972	1903	1846	1797	1754	1717	1684	1655	1629	1606	1585	1567	1551	1537	1525	1514	1505	1498
20	2789	1645	1645	1736	1767	1765	1747	1724	1698	1673	1648	1625	1603	1583	1565	1548	1532	1518	1505	1494	1484	1475	1467	1460	1455
21	0	0	200	932	1238	1380	1450	1485	1500	1505	1504	1499	1492	1484	1476	1467	1459	1451	1444	1437	1431	1425	1420	1416	1413
22	0	0	24	551	878	1075	1195	1270	1317	1347	1366	1378	1385	1388	1389	1389	1388	1386	1384	1381	1379	1376	1374	1372	1371
23	0	0	3	369	650	850	990	1087	1156	1205	1240	1265	1284	1297	1307	1314	1319	1323	1325	1327	1328	1329	1329	1330	1330
24	0	0	0	272	504	689	830	937	1018	1079	1126	1162	1190	1212	1229	1243	1254	1262	1269	1275	1279	1283	1286	1288	1290
25	0	0	0	213	407	572	706	815	901	970	1025	1069	1104	1133	1157	1176	1192	1205	1216	1225	1233	1239	1244	1248	1251
26	0	0	0	175	340	486	611	716	804	877	936	986	1027	1061	1090	1114	1134	1151	1166	1178	1188	1197	1204	1210	1215
27	0	0	0	149	291	421	537	637	724	797	860	913	958	997	1029	1057	1081	1101	1119	1134	1146	1157	1166	1174	1180
28	0	0	0	130	255	372	478	573	657	731	794	849	897	939	974	1005	1032	1055	1075	1093	1108	1120	1131	1140	1147
29	0	0	0	115	227	333	432	522	602	674	738	794	844	887	925	959	988	1013	1036	1055	1072	1086	1098	1108	1116
30	0	0	0	104	206	303	394	479	557	627	690	747	797	842	882	917	948	975	999	1020	1039	1054	1068	1079	1088
31	0	0	0	95	189	279	364	445	519	587	650	706	757	802	843	880	913	941	967	989	1009	1026	1040	1052	1062
32	0	0	0	88	175	259	340	416	488	554	615	671	722	768	810	848	881	911	938	961	982	1000	1015	1028	1039
33	0	0	0	83	164	244	320	393	462	527	587	642	693	739	781	819	854	885	912	937	958	977	993	1007	1018
34	0	0	0	78	156	231	304	375	441	504	563	617	668	714	757	795	831	862	890	916	938	957	974	988	999
35	0	0	0	75	149	221	292	359	424	485	543	597	647	694	736	775	811	843	872	898	920	940	957	972	984
36	0	0	0	72	143	213	282	347	411	471	528	581	631	677	720	759	795	827	857	883	906	926	944	959	971
37	0	0	0	70	139	207	274	338	400	459	516	568	618	664	707	746	782	815	844	871	894	915	933	948	961
38	0	0	0	68	136	203	268	332	393	451	507	559	608	654	697	737	773	806	835	862	886	907	925	940	953
39	0	0	0	67	134	200	265	328	388	446	501	553	602	648	691	730	766	800	829	856	880	901	919	935	948
40	0	0	0	67	133	199	263	325	386	443	498	550	599	645	688	727	763	797	827	853	877	899	917	932	945

Suction Pressures, (- .0010 Pa) depth (ft.)----->

	23.4	24.4	25.4	26.4

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1	1969	1952	1942	1936
2	1965	1949	1938	1933
3	1959	1943	1932	1927
4	1949	1933	1922	1917
5	1936	1920	1910	1905
6	1919	1904	1894	1889
7	1900	1885	1876	1871
8	1878	1864	1854	1849
9	1853	1839	1830	1825
10	1825	1812	1803	1799
11	1795	1783	1774	1770
12	1762	1751	1743	1739
13	1728	1717	1710	1707
14	1691	1682	1675	1672
15	1653	1645	1639	1636
16	1614	1607	1602	1599
17	1574	1568	1563	1561
18	1533	1528	1524	1523
19	1492	1488	1485	1484
20	1451	1448	1445	1444
21	1410	1408	1406	1406
22	1369	1368	1368	1367
23	1330	1330	1330	1330
24	1291	1292	1293	1293
25	1254	1256	1257	1258
26	1218	1221	1223	1224
27	1184	1188	1190	1191
28	1152	1157	1159	1161
29	1123	1127	1130	1132
30	1095	1100	1104	1106
31	1070	1075	1079	1081
32	1047	1053	1057	1059
33	1026	1033	1037	1039
34	1009	1015	1020	1022
35	993	1000	1005	1007
36	981	988	993	995
37	970	978	983	985
38	963	970	975	978
39	958	965	970	973
40	955	963	968	970

SCENARIO TITLE: OU2 RI: RUN 01, SITE-SPECIFIC SOIL DATA, DEFAULT BUILDING PARAMETERS
FILE NAME: OU2RI010

RAETRAD v3.0
RAdon Emanation and TRAnsport into Dwellings
developed by Rogers & Associates Engineering Corporation

Soil Gas Radon Concentrations (10.00000 pCi/Liter) depth (ft.) ----->

	.0	.5	.8	1.0	2.0	3.0	4.1	5.1	6.1	7.1	8.1	9.1	10.2	11.2	12.2	13.2	14.2	15.2	16.3	17.3	18.3	19.3	20.3	21.3	22.4
1	2483	2535	2570	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
2	2483	2535	2570	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
3	2483	2535	2570	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
4	2483	2535	2570	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
5	2483	2534	2569	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
6	2483	2534	2569	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
7	2482	2533	2568	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
8	2481	2532	2567	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
9	2479	2530	2566	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
10	2476	2527	2562	927	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
11	2471	2522	2557	926	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
12	2462	2513	2548	925	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
13	2446	2497	2532	924	802	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
14	2419	2469	2503	922	801	792	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
15	2372	2421	2455	918	801	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
16	2290	2337	2370	912	801	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
17	2147	2192	2221	900	800	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
18	1898	1938	1962	880	798	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
19	1589	1624	1610	852	796	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
20	606	992	1006	807	793	792	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
21	0	0	238	753	789	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
22	0	0	148	743	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
23	0	0	138	742	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
24	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
25	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
26	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
27	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
28	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
29	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
30	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
31	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
32	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
33	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
34	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
35	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
36	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
37	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
38	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
39	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791
40	0	0	136	741	788	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791	791

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Soil Gas Radon Concentrations (10.00000 pCi/Liter) depth (ft.) ----->

	23.4	24.4	25.4	26.4
1	791	791	791	791
2	791	791	791	791
3	791	791	791	791
4	791	791	791	791
5	791	791	791	791
6	791	791	791	791
7	791	791	791	791
8	791	791	791	791
9	791	791	791	791
10	791	791	791	791
11	791	791	791	791
12	791	791	791	791
13	791	791	791	791
14	791	791	791	791
15	791	791	791	791
16	791	791	791	791
17	791	791	791	791
18	791	791	791	791
19	791	791	791	791
20	791	791	791	791
21	791	791	791	791
22	791	791	791	791
23	791	791	791	791
24	791	791	791	791
25	791	791	791	791
26	791	791	791	791
27	791	791	791	791
28	791	791	791	791
29	791	791	791	791
30	791	791	791	791
31	791	791	791	791
32	791	791	791	791
33	791	791	791	791
34	791	791	791	791
35	791	791	791	791
36	791	791	791	791
37	791	791	791	791
38	791	791	791	791
39	791	791	791	791
40	791	791	791	791

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1.0323E-02 1.2472E-02 2.8886E+02
1.7346E+01 1.0000E-01 9.8400E+00

ATTACHMENT B.II

TOXICITY PROFILES

ATTACHMENT B.II

TOXICITY PROFILES

This section presents more detailed toxicity information for individual CPCs specific to Operable Unit 2. This information includes summary descriptions of toxicity, based on critical studies used as a basis for the toxicity value; toxicity effects resulting from chronic exposure; and the critical toxic effects observed or target organ affected.

B.II.1 TOXICITY PROFILES: RADIONUCLIDES

This section presents toxicity information for radionuclide compounds. It was assumed that all radionuclides are present in the soils as oxides or carbonates. This represents a conservative assumption because radionuclides clear slowly from environmental media. Table B.II.1-1 presents the U.S. Environmental Protection Agency derived slope factors.

B.II.1.1 Cesium-137

Pharmacokinetics

The gastrointestinal uptake of cesium is rapid, and its absorption coefficient is around 85 percent in mammals. The half-life of cesium is thought to average 80 days. The EPA (1993c) has derived a gastrointestinal absorption factor for cesium of 1.0, equivalent to 100 percent.

The physiological properties of cesium resemble those of potassium, although quantitative differences arise in transport by cell membranes; cesium can displace potassium from muscle and red cells. Potassium enters the cells via sodium-potassium dependent ATPase. Cesium ions are effective in activating this enzyme and compete with potassium for carrier sites (Davie and Coleman 1988).

Noncarcinogenic Toxicity

Cesium salts can be regarded as being virtually nontoxic. However, in acute animal studies, the hydroxide was approximately 10 times more toxic than the chloride, bromide, or iodide. Acute toxicity, which was observed only at very high cesium concentrations (10 to 20 mmol Cs/kg) in mice, is characterized by dysautonomic upset with parasympathetic predominance and a multiphasic excitation/depression action on the central nervous system. The organs most affected appear to be the liver, intestine, heart, and kidneys.

TABLE B.II.1-1

CANCER SLOPE FACTORS FOR OPERABLE UNIT 2 RADIONUCLIDES OF CONCERN

Radionuclide	ICRP Lung Class[a]	Inhalation[b] $(pCi)^{-1}$	GI Absorption Factor[b] (f_1)	Ingestion[b] $(pCi)^{-1}$	Penetrating[b] External Exposure $(pCi\text{-}yr/g)^{-1}$
Cesium-137 + dtr	D	1.9×10^{-11}	1.0×10^{0}	2.8×10^{-11}	2.0×10^{-6}
Neptunium-237 + dtr	W	2.9×10^{-8}	1.0×10^{-3}	2.2×10^{-10}	4.3×10^{-7}
Lead-210 + 2 dtrs	D	4.0×10^{-9}	2.0×10^{-1}	6.6×10^{-10}	1.6×10^{-10}
Plutonium-238	Y	3.9×10^{-8}	1.0×10^{-3}	2.2×10^{-10}	2.8×10^{-11}
Plutonium-239/240	Y	3.8×10^{-8}	1.0×10^{-3}	2.3×10^{-10}	2.7×10^{-11}
Radium-224	W	1.2×10^{-9}	2.0×10^{-1}	3.8×10^{-11}	2.3×10^{-8}
Radium-226 + 8 dtrs	W	7.0×10^{-9}	2.0×10^{-1}	7.8×10^{-10}	6.0×10^{-6}
Radium-228 + dtr	W	6.9×10^{-10}	2.0×10^{-1}	1.0×10^{-10}	2.9×10^{-6}
Ruthenium-106	Y	4.4×10^{-10}	5.0×10^{-2}	9.5×10^{-12}	0.0×10^{0}
Strontium-90 + dtr	D	6.2×10^{-11}	3.0×10^{-1}	3.6×10^{-11}	0.0×10^{0}
Technetium-99	W	8.3×10^{-12}	8.0×10^{-1}	1.3×10^{-12}	6.0×10^{-13}
Thorium-228 + 7 dtrs	Y	7.8×10^{-8}	2.0×10^{-4}	5.5×10^{-11}	5.6×10^{-6}
Thorium-230	Y	2.9×10^{-8}	2.0×10^{-4}	1.3×10^{-11}	5.4×10^{-11}
Thorium-232 + 10 dtrs	Y	1.1×10^{-7}	2.0×1^{-1}	1.7×10^{-10}	8.5×10^{-6}
Uranium-234	Y	2.6×10^{-8}	5.0×10^{-2}	1.6×10^{-11}	3.0×10^{-11}
Uranium-235 + dtr	Y	2.5×10^{-8}	5.0×10^{-2}	1.6×10^{-11}	2.4×10^{-7}
Uranium-235/236	Y	2.5×10^{-8}	5.0×10^{-2}	1.6×10^{-11}	2.4×10^{-7}
Uranium-238 + 2 dtrs	Y	5.2×10^{-8}	5.0×10^{-2}	2.8×10^{-11}	3.6×10^{-8}

[a] "Y" = years, "W" = weeks, "D" = days, "*" = gas.
[b] EPA 1993b

In beagles injected with massive doses of Cs-137, early deaths occurred as a result of bone marrow destruction (Davie and Coleman 1988).

Carcinogenic Toxicity

In beagles injected with massive doses of Cs-137, neurofibrosarcoma cancers occurred in the survivors (Davie and Coleman 1988).

The EPA has derived cancer slope factors for cesium and its progeny, and they are presented in Table B.II.1-1.

B.II.1.2 Lead-210

Noncarcinogenic Toxicity

Data regarding the noncarcinogenic toxicity of Pb-210 were not located.

Carcinogenicity

The EPA has derived cancer slope factors for Pb-210, and they are presented in Table B.II.1-1.

B.II.1.3 Neptunium-237

Neptunium isotopes have not presented unusual problems in occupational radiation protection, nor have they, until recently, caused special environmental concern. Attention has recently been directed to the potential environmental exposure to the long-lived Np-237, which is estimated to be the principal surviving component of high-level nuclear waste after ten or twenty thousand years. Np-237 has a half-life of 2.14×10^6 years and is primarily produced in nuclear reactors via the (n,2n) and (n,8) nuclear reactions with uranium. Its presence in the high-level nuclear waste, and its presumed environmental mobility, has made it an isotope of special environmental concern. It has been estimated that Np-237 may be the most hazardous remaining constituent of high-level nuclear waste during the interval from 10,000 to 30,000 years following disposal.

Pharmacokinetics

The fraction of ingested neptunium absorbed from the gastrointestinal tract into blood (F_1) is currently assumed to be 0.01. This value was based on experimental data involving a large group of rats fed with doses of neptunium exceeding 1 mg/kg. When the dietary dose was lower than 1 mg/kg, the fraction F_1 was 0.001 or less. Data on distribution and retention of neptunium in rats indicate that its

metabolic behavior is similar to that of plutonium. However, there are some indications that neptunium may distribute more like calcium than like plutonium in the skeleton. Forty-five percent of the neptunium leaving the transfer compartment will be translocated to mineral bone. Another 45 percent will be transported to the liver, and 0.035 percent to the testes or 0.011 percent to the ovaries. The remaining neptunium leaving the transfer compartment is assumed to go directly to excreta. The biological half-life of neptunium is about 100 years in mineral bone, about 40 years in the liver, and it is assumed that neptunium is permanently retained in the gonads. These retention and translocation data were based on the ICRP common model for systemic distribution and retention of all transuranic elements. The model itself was largely based on plutonium data.

Noncarcinogenic Toxicity

All animal toxicity studies with neptunium have employed Np-237. Because of its low specified activity (0.76 mCi/g), the chemical toxicity effects of Np-237 are often observed to the exclusion of radiation effects. Soviet data in this area were studied by Moskalev et al (NCRP 1988). The concern was not with the chemical effects. Although such effects might be a controlling factor in an acute exposure to Np-237, they would not be an important factor at the usual levels concerning radiation protection, and certainly not at the very low levels of potential environmental exposure. Therefore, health effects are assessed only with respect to carcinogenicity.

Carcinogenicity

The effects of neptunium exposure have not been studied in man. For radiation protection purposes, it has been assumed that radiation doses resulting from neptunium deposition in organs and tissues will result in biomedical effects similar to those observed following the exposure of humans to other sources of ionizing radiation. The very limited data on neptunium effects in animals provide no direct useful estimates of risk to humans. Although these data play no direct role in establishing neptunium standards, they can nevertheless help to validate these standards through comparisons with other animal studies employing other radionuclides.

The long-term radiation effects of Np-237 have been studied only in rats. Genetic effects have not been studied. Bone cancer has been the predominant long-term effect of low-level injections of Np-237. Both lung and bone cancer incidences are elevated following inhalation exposure. There is no indication that neptunium at low exposure levels constitutes a unique health risk unpredictable from its general radiological characteristics.

The 1987 NCRP recommendations for annual limits on Np-237 intake are as follows:

• Oral ingestion	0.6 μCi	Based on nonstochastic limits
	2.0 μCi	Based on stochastic limits
• Inhalation	0.005 μCi	Based on nonstochastic limits
	0.010 μCi	Based on stochastic limits

The nonstochastic limit or dose equivalent applies to bone surface.

The EPA has derived cancer slope factors for neptunium, and they are presented in Table B.II.1-1.

B.II.1.4 Plutonium

There are no reports on the chemical toxicity of plutonium; however, the fibrosis observed in the lungs of exposed animals and humans could be due to chemical interactions. The radiologic toxicity of plutonium involves bone necrosis, bone and lung cancer, and detrimental effects on the reproductive system. Also, toxic effects are observed in offspring of pregnant animals exposed to plutonium. No ingestion data specific to plutonium are available.

Among the plutonium isotopes, the short-lived Pu-241 is especially toxic because of the high energy associated with its alpha particle emission. The toxicity of plutonium compounds is based primarily on the very high radiotoxicity of the plutonium atom and secondarily upon whatever atoms or combinations of atoms they might contain (Sax 1989). When inhaled, plutonium is retained in the lungs with an effective half-life that varies from hundreds of days for plutonium oxides to tens of days for more soluble forms. A significant portion of the plutonium oxide that leaves the lungs is translocated to the tracheobronchial lymph nodes. Plutonium solubilized within the lungs is translocated to the liver and skeleton where it is very tenaciously retained (Klaassen 1986).

In a classic long-term toxicity study performed by Bair et al., the effects of inhaled plutonium oxide were studied in beagle dogs for up to 10 years following inhalation exposure. At the highest levels of deposited activity, the dogs died within several hundred days with radiation pneumonitis and pulmonary fibrosis; at later times death was related to severe pulmonary fibrosis, and beyond 1000 days, although pulmonary fibrosis was still prominent, death was due to primary pulmonary neoplasia. The most common neoplasm was bronchioloalveolar carcinoma (Klaassen 1986). Hahn et al. (1983), using data reported by Bair and Thomas (1976), calculated the risk factor for Pu-239 alpha

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irradiation of the lungs to be 600 lung tumors per million rad to lung, or, assuming an RBE of 20, 30 lung tumors per millirem to lung.

Human data for plutonium exposure are available. Among workers contaminated, the case histories have been documented of 26 men who worked with plutonium during World War II. The initial body burden of these workers was between 540 and 229,500 pCi (reported as between 20 and 8500 Becquerel), and 11 of them received doses exceeding the maximum allowed by the International Commission for Radiological Protection. After a medical follow up of 37 years, 2 members of this group died of myocardial infarction and accidental trauma, respectively, compared to the 6.6 deaths expected on the basis of the adjusted rates for white males. Their 1982 exam provided no evidence that 37 years of exposure to internally deposited plutonium had adverse effects on their health (Seiler 1988).

Less toxicity data are available on trans-plutonium radionuclides such as americium and curium; however, the data that are available indicate a qualitative similarity to the toxicity of plutonium. McClellan, et al. (1972) noted that inhaled americium and curium, even as oxides, appeared more soluble than inhaled plutonium and rapidly translocated to the liver and skeleton. (Klaassen 1986)

Carcinogenicity

The EPA classifies all radionuclides as weight-of-evidence Group A substances (human carcinogens), based on their characteristic of emitting ionizing radiation and on the extensive epidemiologic data associating exposure with radiogenic cancers in humans (EPA 1992d). The carcinogenicity of Pu-238 (the predominate plutonium isotope at the FEMP) from internal exposure is due to alpha particles. The EPA (1992d) has reported cancer potency slope factors for the plutonium isotopes, and these are presented in Table B.II.1-1.

B.II.1.5 Radium and Radon

Noncarcinogenic Toxicity

No chemical toxic effects of exposure to radium has been documented, and the EPA has not developed an RfD for radium; therefore, the health hazard for radium is associated with potential radiocarcinogenic effects.

Carcinogenicity

Four isotopes of radium occur naturally, Ra-223 (actinium series), Ra-224 and Ra-228 (thorium series), and Ra-226 (uranium series); radium is ubiquitous in the earth's crust and common in groundwater, mineral deposits, soil, food products, and common building materials. Ra-226 has the longest half-life (1600 years) of the radium isotopes and decays by alpha particle emission. Ra-223 and Ra-224 are also alpha-particle emitters, and Ra-228 is a beta-particle emitter. The primary uses of radium are for manufacturing luminous dials and instrument faces and for internal radiation therapy. Thus, the bulk of human data on the effects of radium intake are available from studies of radium-dial painters and medical patients who have been administered therapeutic doses of radium.

Radium introduced into the body generates decay products, including gaseous isotopes of radon. Rn-222 generated in the body persists long enough that it easily diffuses into the bloodstream and accumulates in the sinuses, significantly reducing the alpha dose to the radium accumulating tissues but increasing the dose in the sinuses. Ultimately the bone tissues are the principal site of radium accumulation because of the similar chemistry of radium and calcium (NAS 1988). In the bone tissues, radium is initially deposited in endosteal bone surface tissue. There is then a redistribution to the bone volume, where the radium resides with a long retention time.

Dose Response Data - Human and Animal

The following discussion of the health effects of radium exposure is summarized from the report of the BEIR IV Committee on radon and other alpha emitters (NAS 1988). The epidemiological studies of humans were initially stimulated by the appearance of cancer and other adverse health effects associated with occupational exposures to Ra-224, Ra-226, and Ra-228 (by the radium-dial painters). The dial painters had the potential to ingest significant quantities of radium that were known to be harmful. The second most significant study group comprised ankylosing spondylitis patients, who were administered doses of radium solutions for therapeutic reasons. Most of the other studies focused on bone cancer, cancer of the paranasal sinuses, and cancer of the mastoid air cells, because the association of these effects with radium exposure was well known.

Although epidemiological investigations have documented the association between radium exposure and carcinogenic effects, there has been considerable debate over the dose-response relationship involved. Bone cancer incidence has been evaluated as a function of a variety of parameters that represent a measure of radium exposure, such as absorbed dose to the skeleton, pure radium

equivalents, and cumulative rad-years (Evans 1966). The results indicated a nonlinear relationship fits the data. A separate analysis of the same bone cancer induction data confirmed the finding of a nonlinear fit (Mays and Lloyd 1972). The conclusion from both of these analyses is that a linear nonthreshold relationship is likely to significantly over-predict cancer incidence at low doses. Later reassessments presented a linear-quadratic-exponential dose-response relationship (Rowland et al. 1971, 1978a, 1978b, 1983) and a dependence of incidence on the square of radium intake normalized to body weight (Marshall and Groer 1977).

Two extensive studies of ankylosing spondylitis patients treated in Germany with solutions of Ra-224 are most noteworthy. In the first, a 900-patient cohort treated with a Ra-224 colloid during the period from 1946 to 1951 with a follow-up period for more than 30 years, revealed bone cancer incidence associated with the high absorbed doses from the therapeutic treatments (Spiess 1969; Spiess and Mays 1970, 1973). In the second study, a cohort of about 1400 patients treated with small doses of Ra-224 for ankylosing spondylitis showed a similar association between dose and cancer induction (Spiess 1969; Spiess and Mays 1970, 1973). The analyses were consistent with a variety of dose-response relationships; however, none can be disproved because of the scatter in the data.

Cancers of the paranasal sinuses and the mastoid air cells have been associated with exposure to Ra-226 and Ra-228 since the 1930s (Martland 1939). These effects were initially seen in the radium-dial painters, who received high absorbed doses from the quantities of radium they ingested. Excess incidence is evident when compared to the natural incidence, which is very low. After exposure to radium, these types of cancers were expressed later than bone cancers (Evans et al. 1969; Finkel et al. 1969; Rowland et al. 1971; Rundo et al. 1986).

As discussed above, Rn-222 generated in the body persists long enough that it easily diffuses into the bloodstream and accumulates in the sinuses, significantly increasing the dose in the sinuses. Studies of cancers of the sinuses and mastoid cells conducted in beagle dogs injected with a variety of alpha-emitting radionuclides revealed excess incidence of these cancers (Schlenker 1980). Not all of the tumors were induced by alpha emitters that produce a gaseous decay product; therefore, a gaseous decay product was not essential to induction. Nevertheless, the risk of these cancers from Ra-226 and its decay products (including Rn-222) is considered significantly greater than from other alpha-emitting radionuclides.

The incidence of leukemia and other blood diseases among the radium-dial painters has been linked to radium ingestion. Martland (1931) demonstrated development of anemias and leukopenia (low leukocyte count) in the dial painters. Evans' study (1966) included leukemia and anemia as possible effects of radium accumulation in the body. Finkel et al. (1969) discovered cases of leukemia and aplastic anemia in studies of the radium-dial painters exposed from 1918 to 1933. Among a cohort of 634 female dial painters first employed before 1930, three deaths were attributed to leukemia (Polednak 1978). This final study exceeded expectations because the natural incidence of leukemia is very low. An epidemiological study of 1285 women employed as dial painters before 1930, and 1185 employed between 1930 and 1949 (when radium contamination and exposures were much lower) revealed standard mortality ratios of 73 and 221, respectively (Stebbings et al. 1984). However, the most comprehensive and definitive study of U.S. dial painters include all workers employed before 1970 (Spiers et al. 1983). Ten cases of leukemia were found among the worker cohort of 2940 persons. The expected number of natural cases for this group would be 9.2. The study concluded that the incidence in the cohort does not differ significantly from natural incidence (Spiers et al. 1983). In summary, the accumulation of very high levels of radium is associated with severe anemias and leukemia (NAS 1988). However, at lower levels of accumulation, such as those experienced by the majority of U.S. radium-dial painters, especially in later years, the accumulated radium does not appear to significantly increase the risk of leukemia (NAS 1988).

The BEIR IV Committee presented a cancer risk factor of 200×10^{-6} per rad for bone sarcomas from protracted exposure to radium in its report on radon and other alpha emitters (NAS 1988).

B.II.1.6 Radon and Progeny

Toxicity

There are no known toxic effects of exposure to radon gas or its short-lived progeny. However, short-lived radon progeny decays to relatively long-lived lead. Because lead is a chemical toxicant, significant accumulations of radon pose a potential source of lead for exposure pathways to receptors.

Carcinogenicity

Exposure to air contaminated with radon gas and associated airborne progeny has been linked to increased risk of lung cancer. The risk is attributed to inhalation of the short-lived progeny of radon that are attached to particulates, which lodge in the lung passages and produce a radiation dose that causes lung cancer. Radon progeny that do not lodge in the lung passages are exhaled, and do not

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deliver a radiation dose. Lung cancer results when the bronchial epithelium of the lung passages is exposed to alpha particles emitted from decaying radon progeny (i.e., Po-214 and Po-218) lodged in the lung passages.

Three isotopes of radon are of potential concern, one associated with each of the three natural decay series. Rn-222, Rn-220, and Rn-219 are members of the uranium, thorium, and actinium decay series, respectively. Rn-222 is the isotope of primary concern because its half-life 3.82 days and mobility as an inert gas facilitate its outdoor and indoor migration, thus potentially exposing receptors to elevated concentrations of Rn-222 and its short-lived progeny. Rn-220 (half-life, 55.6 seconds) and Rn-219 (3.96 seconds) are generally of less concern because their very short half-lives often result in decay before these can migrate and accumulate in elevated quantities where receptors may be exposed. For example, all three isotopes of radon may be of concern in the air in buildings that contain the appropriate parent radionuclides (in the form of surface contamination or drummed material, for example). At the FEMP, however, Rn-220 and Rn-219 are not expected to be released from a source such as the K-65 silos because their short half-lives cause them to decay before migrating out of the waste matrix or out of the containment provided by the silos.

Dose Response Data - Human and Animal

The following discussion regarding the health effects of exposure to radon and radon progeny is summarized from the report of the BEIR IV Committee on radon and other alpha emitters (NAS 1988). The radiological effect of concern from exposure is lung cancer.

The lung cancer hazard associated with working in underground mines was first recognized by Harting and Hesse in 1879 as a result of autopsies of European miners (Harting and Hesse 1879). The most important human populations studied with regard to radon progeny exposure were the underground miners exposed to widely differing concentrations of airborne Rn-222 progeny in mines (NCRP 1984b). The lung cancer mortality risk estimates for radon progeny exposure published by the BEIR IV Committee (NAS 1988) were based on an epidemiological study of these underground miner populations. The assessment of the risk from exposure to radon progeny by the BEIR IV Committee represents the most recent comprehensive examination of estimated health risks associated with exposure.

The BEIR IV Committee relied heavily on data from four principal studies of miners: Ontario uranium miners, Saskatchewan uranium miners, Swedish metal miners, and Colorado Plateau uranium miners. Underground miners exposed to radon progeny (in the mines) have an increased risk of lung cancer, as demonstrated in these epidemiological study populations. Animal models experimentally exposed to airborne radon progeny also developed lung cancers. To supplement the information available from the human epidemiological studies, animal model studies have provided information on the dose-response relationship and the effects of variations in the exposure rate, physical characteristics of the lungs, and air quality. Thus, both human epidemiological data and animal experimental data indicate that exposure to radon progeny induces lung cancer. The data also describe the relationship between exposure and health effect as a function of influencing factors.

In its study of the human epidemiological data, the BEIR IV Committee has reevaluated the primary data (i.e., exposure histories and mortality) for the four principal epidemiological study groups of underground miners exposed to radon progeny. From this reevaluation, the committee has estimated the risk of developing fatal lung cancer. The risk from lifetime exposure to radon progeny is 350 x 10^{-6} excess fatal lung cancers per cumulative working level month (WLM) as exposure. The WLM is defined as the cumulative exposure to an airborne concentration of short-lived radon progeny (equal to one working level) for a period of one working month. It must be noted that this estimate, quantified as fatal lung cancer risk, was based primarily on epidemiological studies of humans and is expressed per unit cumulative exposure to progeny (WLM^{-1}). The EPA slope factors addressing cancer incidence were based on calculated radiation doses to organs and tissues and are expressed per unit radioactivity intake (pCi^{-1}). Thus, the EPA and BEIR IV risk estimates are not directly comparable. The EPA cancer slope factors were used to assess risk attributable to radon and radon progeny exposure. It is also noted that EPA has adopted a nominal risk estimate of 360 x 10^{-6} per WLM for use in NESHAPS (EPA 1989l). This estimate was based primarily on EPA's consideration of the BEIR IV assessment; however, EPA did average radon risk estimates derived from BEIR IV and ICRP models to calculate the estimate of 360 x 10^{-6} per WLM.

Although the carcinogenicity of radon progeny is established and the hazards of exposure during mining are well recognized, the hazards of exposure in other environments have not yet been adequately quantified (NAS 1988). A few exploratory epidemiological studies of lung cancer risk associated with radon progeny exposure in homes have been conducted; however, the results are inconclusive and inadequate for the purpose of risk estimation (NAS 1988).

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The model developed by the BEIR IV Committee may be used to estimate risks under other environmental conditions to which persons may be routinely exposed; however, it must be recognized that the committee's model was based on epidemiological evaluations of occupational exposure conditions in underground mines. Therefore, assumptions must be made regarding the similarity of exposed populations, levels of exposure, and factors such as cigarette smoking, when using the model for nonoccupational conditions such as the indoor home environment.

Using the BEIR IV risk factor (NAS 1988) of 350 x 10^{-6} WLM^{-1} for lung cancer mortality from inhalation of Rn-222 and progeny, and by assuming 51.5 working months per year (8760 hours per year divided by 170 hours worked per month), 100 pCi Rn/liter air, short-lived Rn-222 progeny present in 50 percent equilibrium, and an inhalation rate of 20 m^3/day for 365 days/year, one can derive a lung cancer mortality risk factor of 1.2 x 10^{-11} per pCi. The EPA cancer slope factor from HEAST for inhalation of Rn-222 plus progeny is 7.7 x 10^{-12} per pCi (EPA 1992b). It must be noted that the BEIR IV risk estimate pertains to lung cancer mortality, while the EPA cancer slope factors all pertain to cancer induction rather than cancer fatality.

B.II.1.7 Ruthenium-106

Pharmacokinetics

The biochemistry and metabolism of ruthenium and its salts have not been investigated in detail. Ruthenium chelates are readily absorbed and rapidly excreted. A transient retention of ruthenium occurs in the kidneys, muscle, liver, bone, and probably also in the lungs during experiments using radioruthenium chloride.

Once absorbed into the bone, ruthenium is retained for a long time (Léonard 1988).

The EPA (1993c) has derived a gastrointestinal absorption factor for ruthenium of 0.05, equivalent to 5 percent.

Noncarcinogenic Toxicity

Most ruthenium salts are considered to be slightly toxic, but fumes of ruthenium tetroxide and of ruthenium heated in air are highly injurious to the eyes and the lung and can produce nasal ulcerations.

Acute LD_{50} values after intraperitoneal administration of $RuCl_3$ range from 108 mg/kg (mouse) to 360 mg/kg (rat); after oral treatment, they range from 210 mg/kg (guinea pig) to 460 mg/kg (mouse). $RuCl_3OH$ is less toxic: acute LD_{50} values are 660 mg/kg (mouse) and 1250 mg/kg (rat) after oral administration, and 225 mg/kg (mouse) after intraperitoneal administration.

Ruthenium red is a known antagonist of Ca^{+2} and inhibits Ca^{+2} transport and binding in mitochondria membranes and muscle tissues. This salt also inhibits Ca^{+2}-ATPase activity.

Ruthenium red is also an antagonist of the depressive action of noradrenaline and 5-hydroxytryptamine on cortical neurons, and by action on neurotransmitters it can produce paralysis and convulsions in laboratory animals (Léonard 1988).

Carcinogenicity

The EPA has derived cancer slope factors for Ru-106, which are presented in Table B.II.1-1.

B.II.1.8 Strontium

Pharmacokinetics

Wenning and Kirsch (1988) reported that the gastrointestinal absorption of soluble strontium compounds ranges from 5 to 25 percent of the ingested dose and the EPA (1992d) has derived a gastrointestinal absorption efficiency factor of 0.3. Insoluble strontium compounds are absorbed to about 5 percent. Data regarding inhalation or dermal absorption has not been located.

Strontium is an alkaline earth metal similar in chemical behavior to calcium (Wenning and Kirsch 1988). About 99 percent of the body burden is in the skeleton. Excretion is principally in the urine.

Noncarcinogenic Toxicity

Stable strontium has induced rachitic changes in the bones, particularly of the young (EPA 1992d). Presumably, Sr-90 would also induce rachitic changes in bone. The concern at the FEMP, however, is with the radiological effects (carcinogenicity) of Sr-90, rather than the noncarcinogenic toxicity.

Carcinogenicity

The EPA (1992d) has assigned stable strontium to cancer weight-of-evidence Group D, indicating it is not classifiable as to humans carcinogenicity. Quantitative cancer risk estimates were not derived for

Group D substances. The EPA classifies all radionuclides as Group A substances (human carcinogens), based on their characteristic of emitting ionizing radiation and on the extensive epidemiologic data associating exposure with radiogenic cancers in humans (EPA 1992d). The EPA (1992d) has derived cancer potency slope factors for Sr-90, and its radioactive decay product of 3.6 x 10^{-11} per pCi for ingestion and 6.2 x 10^{-11} per pCi for inhalation exposure. There is no slope factor for external exposure to Sr-90, which does not emit penetrating radiation (gamma- or x-rays).

B.II.1.9 Technetium

Noncarcinogenic Toxicity

No isotopes of technetium are stable (Clarke and Podbielski 1988). Lethality due to radiation toxicity usually occurs before the nonradiologic effects of technetium become manifest; hence, little is known of the metabolic effects of the element.

Carcinogenicity

The EPA classifies all radionuclides as weight-of-evidence Group A substances (human carcinogens), based on their characteristic of emitting ionizing radiation and on the extensive epidemiologic data associating exposure with radiogenic cancers in humans (EPA 1992d). The internal carcinogenicity of Tc-99 is due to its emission of beta particles (Clarke and Podbielski 1988). The EPA (1992d) has derived cancer potency slope factors for Tc-99 of 1.3 x 10^{-12} per pCi for ingestion, 8.3 x 10^{-12} per pCi for inhalation, and 6.0 x 10^{-13} per pCi yr/g for external exposure.

B.II.1.10 Thorium

Noncarcinogenic Toxicity

No toxic effects of exposure to thorium have been documented, and the EPA has not developed an RfD for thorium; therefore, the health hazard for thorium is associated with its potential radiocarcinogenic effects.

Carcinogenicity

Natural thorium is present in the earth's crust as a primordial element. Th-232 isotope accounts for approximately 100 percent of the mass abundance of thorium; however, the other isotopes of thorium exist as members of the three natural decay series. The half-life of Th-232 is very long (approximately 10 billion years); thus the specific activity is relatively low and the rate of decay is

slow. Th-232 decays by alpha particle emission, as do most of the progeny in the thorium natural decay series.

Thorium has historically been used as a medical imaging agent, because it is a heavy atom that provides contrast in radiographic imaging. In this role thorium has been used commercially as Thorotrast, a 25-percent colloidal solution of thorium dioxide. The following discussion of the health effects from thorium exposure is summarized from the report of the BEIR IV Committee on radon and other alpha emitters (NAS 1988).

Thorotrast has been used extensively in the United States, Europe, and Japan as an intravascular contrast agent for cerebral and limb angiography. Thorotrast has also been injected into the spleen for hepatolienography and into nasal and paranasal sinuses. These uses of Thorotrast result in deposition of the thorium (and subsequent decay products) in tissues and organs of the body, most frequently in the reticuloendothelial tissues in bone (NAS 1988). Once deposited in these tissues, alpha particle emissions from the decay of Th-232 and its progeny irradiate the tissues for long periods of time at low-dose rates.

Dose-Response Data - Human

The data on human health effects of thorium exposure are based primarily on epidemiological studies of Thorotrast patients. The five long-term studies include German, Portuguese, Japanese, Danish, and American patients. In the German study (van Kaick et al. 1978a, 1978b, 1983, 1984a, 1984b, 1986), 5159 Thorotrast patients and 5151 controls were followed since 1933 and 1935, respectively. The Thorotrast patients underwent intravascular injections of Thorotrast to enhance the imaging of cerebral and limb angiography. The results of the follow-up analysis indicated an excess of malignant cancers, most notably liver cancers and leukemias, among the patients relative to the controls.

The Portuguese study (Abbatt 1973; da Motta et al. 1979; Horta et al. 1978) involved about 2500 Thorotrast patients and 2000 controls with a follow-up period of about 30 years. The patients were exposed to Thorotrast from 1929 to 1955, with roughly 60 percent receiving Thorotrast doses for cerebral angiography. The results of the study show a significant excess of malignant cancer deaths among the patients compared to the control group. Particularly notable were the excess patient liver malignancies compared to the controls.

The Japanese study (Kato et al. 1979, 1983; Mori et al. 1979a, 1979b, 1983, 1986) included 282 Thorotrast patients who were administered Thorotrast for angiography and hepatolienography during World War II. The follow-up period spanned 38 to 46 years, and results revealed that patient mortality from malignant liver cancers, other malignant cancers, blood diseases, and cirrhosis of the liver was significantly higher than in the control group.

The Danish study (Faber 1973, 1977, 1978, 1979, 1983, 1986) involved 1319 Thorotrast patients injected with Thorotrast from 1935 to 1946. The epidemiological analysis revealed excess gastrointestinal malignancies, liver malignancies, malignancies of the lung, and leukemia deaths in patients compared to control individuals. The excess of liver malignancies and leukemias was most notable in the study.

The American study (Falk et al. 1979) is a preliminary epidemiological assessment of Thorotrast patients exposed from 1964 to 1974. All patients had received Thorotrast for either hepatolienography or cerebral angiography. A liver cancer incidence was evident in the investigation and is reportedly continuing to increase. Further follow-up of these individuals is needed.

All five of these human epidemiological studies indicated an excess of malignant cancers among the Thorotrast patients compared to the controls. The excess malignancies were predominantly of the liver and blood (leukemia) types.

Estimation of Excess Risk from Thorotrast Administration

The human epidemiological evidence from the studies of Thorotrast patients represents the primary source of data from which estimates of risk have been derived (NAS 1988). These data can be used to derive estimates of risk for liver cancer and leukemia; however, such estimates strictly apply only to conditions of intravascular Thorotrast injection. The BEIR IV committee derived a risk estimate of up to 300 x 10^{-6} per rad of alpha particle radiation to the liver, and emphasized that these estimates are for Thorotrast, not thorium. The emphasis is because the dosimetry of other isotopes of thorium differs from that of Th-232 in the Thorotrast colloid form. BEIR IV also derived a risk estimate of up to 60 x 10^{-6} per rad of alpha radiation to bone marrow for leukemia, and a value of up to 120 x 10^{-6} per rad of alpha radiation to the skeleton without marrow for bone cancer (NAS 1988).

Dose Response Data - Animal

Experimental studies of animals administered modified Thorotrast solutions provide insight into the possible influence of Thorotrast on carcinogenicity in humans from a "foreign body effect" (i.e., from the colloid solution), or a toxicological effect of the thorium in addition to a radiation dose effect. Studies of mice administered Thorotrast solutions fortified with Th-230 to increase the specific activity of alpha emission delivering radiation dose to tissues, conventional Thorotrast, and zirconium dioxide solution (Zirconotrast) have provided evidence of increased carcinogenicity of Thorotrast relative to Zirconotrast (Bensted 1967). Rabbits injected with Th-230 enriched Thorotrast revealed a shortened latency period associated with the higher specific activity solution (Faber 1973). In mice, rabbits, rats, and dogs, the metabolic distribution of Thorotrast and other colloid solutions (including zirconium and hafnium dioxide colloids) has indicated that 1) the organ distribution of the Thorotrast and associated progeny in these animals is comparable to that in humans (Riedel et al. 1979, 1983) and 2) the other colloids fail to reveal significantly different effects attributable to their distributions compared to the Thorotrast (Riedel et al. 1979, 1983).

A study of dose response and possible foreign body effect in rats (Wesch et al. 1973, 1983) was conducted by administering different Th-230 enrichments of Thorotrast (causing variations in dose rate) and by administering different volumes of Thorotrast (dilutions maintaining constant dose rate). The results demonstrated that the frequency of cancers follows a linear dependence with dose rate. However, varying the volume of Thorotrast administered did not correlate with frequency of induction. Although cancer risk did not increase with the volume of Thorotrast at a constant dose rate, the latent period was shortened (Wesch et al. 1973; 1983).

In additional studies of rats injected with Zirconotrast enriched with Th-228, the number of induced cancers increased, and the induced cancers were similar to those induced in humans by Thorotrast (Wesch et al. 1986). The frequency of cancer induction was found to be dose-rate dependent, and the Zirconotrast without Th-228 did not induce excess cancers (Wesch 1986).

In summary, the animal experimental evidence indicates that Thorotrast induces cancers as a result of the radiation dose delivered by the solution. The physical presence of particles in the colloid solution and the chemical effect of the thorium are not likely to influence the induction of cancer (NAS 1988). The EPA derived slope factors are presented in Table B.II.1-1.

B.II.1.11 Uranium

Pharmacokinetics

In general, uranium compounds are not easily absorbed across the human gastrointestinal tract. Soluble uranium compounds demonstrate the best absorption. In a study in which patients drank a solution of uranyl nitrate hexahydrate, a water soluble compound, only 0.5 to 5 percent of the dose was absorbed (Hursh et al. 1969). Recent uranium metabolic models estimated absorption from the gastrointestinal tract to the blood to be 0.6 percent (Wrenn et al. 1987). Although human data concerning absorption by dermal exposure are sparse, water-insoluble uranium compounds were not absorbed in significant quantities across the skin (Yuile 1973) and are not believed to pose a significant risk to humans by this exposure route.

Once absorbed into the bloodstream, uranium compounds are metabolically converted to uranyl ions. The uranyl ion acts as a ligand in the systemic circulation, binding to the plasma proteins and bicarbonate. Although this uranyl-bicarbonate complex is stable at the pH of the plasma, the pH of urine favors dissociation of the complex. This leaves the uranyl ion free to bind to the tissues in the proximal tubule wall of the nephrons of the kidneys, resulting in cellular necrosis (Leggett 1989).

As well as being the only soft tissue that stores uranium in any appreciable quantity, the kidneys are the main organs of excretion (Hursh and Spoor 1973). Approximately 70 percent of an intake of uranium has been estimated to be excreted by the kidneys within 24 hours of intake (Berlin and Rudell 1979). Uranium that is not excreted is stored in the kidneys and bones. Binding to the bone is thought to be caused by the affinity of uranium for the phosphate groups in the bone structure.

Toxicity

Dose-Response Data - Human

Exposure to uranium, a chemical toxicant, leads to nephritis in the kidneys. Data on human exposure to uranium compounds were collected from 1940 to 1960 in acute studies on terminal and volunteer patients. Single injections of 70 to 100 μg/kg of uranium nitrate to terminally ill patients resulted in proteinuria and increased levels of catalase in the urine (Berlin and Rudell 1979; Luessenhop et al. 1958). In another study, patients were given uranyl nitrate injections ranging from 6.3 to 71 μg/kg. One of the early signs of renal damage, the appearance of the enzyme catalase in the urine, occurred in patients receiving 55 to 71 μg/kg (Hursh and Spoor, 1973; Leggett, 1989).

Dose-Response Data - Animal Models

Animal models have demonstrated a of variation of responses in acute intravenous toxicity studies. Rabbits and guinea pigs appear to be the most sensitive. The acute intravenous toxicity of soluble uranium compounds such as uranyl nitrate has been shown to be very high; the approximate dose at which 50 percent of the test organisms do not survive (LD_{50}) for rabbits is 0.1 mg/kg, for guinea pigs 0.3 mg/kg, for rats 1 mg/kg, and for mice 10 to 20 mg/kg (Stokinger, 1982).

In chronic animal studies sublethal threshold doses of uranium have been demonstrated (Leggett 1989). Although the exact mechanism of tolerance is not known, it is believed that regenerated kidney tissue is associated with tolerance. When uranium exposure ceases, the regenerated epithelium transforms into normal renal tubular tissue (Yuile 1973).

An extensive chronic feeding study was performed on rabbits, rats, and dogs for periods of 30 days, 1 year, and 2 years (Maynard and Hodge 1949). These animals received uranium doses of 2.8, 14, and 71 mg/kg/day in the diet. Rabbits were maintained for 30 days, dogs for 1 year, and rats for 1 to 2 years. For all species, water soluble compounds were more toxic than insoluble compounds. The lowest observed adverse effect levels (LOAELs) were established for all compounds and each species (Maynard and Hodge 1949). In all cases, the LOAEL could be established within the first 30 days (EPA 1991f). Of the three species, rabbits appeared to be the most sensitive, with renal damage exhibited at all administered dose levels. The renal damage was judged to be only moderate at the lower doses, but moderately severe at the highest dose. Based on this study, the EPA has established the lowest uranium dose of 2.8 mg/kg/day as the LOAEL (EPA 1991f).

Basis for Reference Dose

The EPA (1991f) has established an RfD for uranium of 3 μg/kg/day. In lieu of a no observed adverse effect level (NOAEL), the RfD was based on the LOAEL of 2.8 mg/kg/day (Maynard and Hodge 1949) and an uncertainty factor of 1000. The uncertainty factor accounts for intraspecies and interspecies variability in toxicological response and for the use of the LOAEL rather than an NOAEL. No factor was included for the short duration of the exposure (30 days), because it has been shown that chronic nephrotoxic effects can be adequately characterized with experiments of acute/subacute duration (EPA 1991b).

Carcinogenicity

Uranium can induce cancer as a result of intake into the body through inhalation or ingestion pathways. The induction of cancer results when organs and tissues of the body are exposed to alpha particles emitted from decaying uranium atoms. Alpha particles are energetic emissions that cause molecular ionizations in a very dense pattern along a short path through matter. The effect of an alpha particle is highly localized due to the short path length traveled (low penetrability) and the ability of the particle to produce many ionizations. The ionization events cause biological damage believed to be responsible for inducing cells to become cancerous. Although other energetic emissions from radioactive decay of atoms (such as beta particles and gamma rays) also cause molecular ionizations, these radiations do not produce the density of ionizations that alpha particles produce. The dense pattern of ionizations caused by alpha particles and the low penetrability of alpha particles are the factors that determine uranium is an internal exposure hazard. Alpha particles are not an external exposure hazard because they do not penetrate sensitive tissues from outside the body. The outer layers of the skin stop the alpha particles before they can penetrate and damage sensitive tissues of inner layers.

The type of uranium (i.e., natural, enriched, or depleted) under consideration is important because different types of uranium have different specific activities (the amount of radioactivity per unit mass). The value of the specific activity of the uranium reflects the number of alpha particles emitted per unit mass. This has a direct impact on the magnitude of the radiological dose delivered internally after the uranium enters the body. Naturally occurring uranium and uranium processed from natural uranium is a mixture of U-234, U-235, and U-238. The difference between natural, enriched, and depleted uranium is defined by the percent U-235 mass enrichment. The higher the U-235 enrichment, the higher the specific activity of the mixture.

Dose-Response Data - Human

The following discussion of data concerning human health effects of uranium exposure is summarized from the report of the BEIR IV Committee on radon and other alpha emitters (NAS 1988). Convincing epidemiological evidence of uranium-induced radiocarcinogenic effects in humans is difficult to obtain. Available epidemiological evidence has come from studies of workers involved in uranium mining and milling operations. It has been noted for some time that uranium workers are at risk of increased cancer mortality; however, inhalation of airborne radon progeny rather than uranium particulates is considered the predominant source of radiation damage to the respiratory tract in

uranium miners. Simultaneous exposures to radon progeny and other elements present in uranium ore are considered confounding factors in those studies of uranium miners intended specifically to examine the radiological effects of exposure to uranium.

Risk estimation for exposure to uranium is based heavily on the carcinogenic effects of other alpha-emitting radionuclides and on animal experiments involving exposure to uranium. Available human epidemiological studies are discussed below.

Epidemiological surveys of uranium workers began in the United States in 1950 (Miller et al. 1956), and reports of increased cancer risk among uranium millers in Europe began appearing in 1959 (Rockstroh 1959). In contrast, other studies have reported little evidence of a health hazard to workers in the uranium processing industry (Ely 1959). The BEIR IV committee (NAS 1988) cautioned that the validity of epidemiological studies on uranium effects must be considered in the context of the power or ability of the studies to detect an effect if one existed. This is important with regard to all of the available epidemiological studies on uranium effects.

An early U.S. Public Health Service study of uranium miners and millers in the Colorado Plateau reported no increase in mortality in the cohort of uranium millers studied (Wagoner et al. 1964). A more detailed study with longer follow-up of the same cohort (Archer et al. 1973) revealed that the number of deaths available for analysis was almost equal to the expected number of deaths determined among controls. Interpretation of the results is complicated because, 1) exposure data were not presented, 2) the excess cases included three diagnostic categories, 3) precautions were not taken (or not stated) to exclude individuals with underground mining exposure through previous employment, 4) and the analysis was not performed in relation to the length of exposure. Because of its weak epidemiological power, the study did not provide strong evidence that uranium has a specific effect.

Several studies of uranium workers exposed to enriched uranium have been performed. A study of workers at the enrichment facility in Oak Ridge between 1943 and 1947 indicated that the mortality of the study cohort was not increased for lung cancer, bone cancer, or nephrotoxic disorders (Polednak and Frome 1986). This study is weakened by data based on exposures of short duration (typically 1 to 2 years), which does not provide conclusive evidence concerning health effects from long-term (chronic) exposure. A subsequent study of a cohort from the same population examined the lung cancer risk from inhaling uranium dust (Cookfair et al. 1983). The results indicated an increased risk

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among the group of workers hired at, or over age 45, and the increased magnitude of risk was greater for higher exposures.

The findings of a retrospective study of uranium mill workers from the Colorado Plateau conducted to examine the health risks of uranium exposure in the absence of uranium mining (Waxweiler et al. 1983) were not statistically significant and are mitigated by the small number of deaths for workers employed for at least five years. The results did not reveal an increase in lung cancer deaths nor conclusively demonstrate an increased nephrotoxic effect.

Past epidemiological studies have failed to conclusively demonstrate health effects from chronic exposure to uranium dust involved in uranium mining and milling operations. However, this does not necessarily mean that the epidemiological data conclusively demonstrate the absence of effect. This is because the power of the studies was limited, weakened by short worker exposure durations, inadequate estimates of uranium exposures, and insufficient worker follow-up time to adequately evaluate long-term effects.

In conclusion, chronic exposure to uranium should be controlled on the basis of nephrotoxicity more than by radiocarcinogenicity from alpha particle emissions (NAS 1988). Quantification of the risk from chronic exposure to uranium alpha particles cannot be determined from published epidemiological studies because of confounding factors and the limited power of the studies to detect increased rates of cancer incidence or mortality (NAS 1988). Therefore, the BEIR IV Committee's a risk estimate for uranium was based on the carcinogenic effects of other alpha emitting radionuclides and animal experiments involving exposure to uranium. The most probable radiogenic effect is an increase in bone sarcomas. The likelihood of sarcomas from exposure to naturally occurring uranium is considered low and demonstrable only if a linear dose-response relationship is assumed (Mays et al. 1985). If the dose-response relationship is quadratic, then virtually no effect would be expected from naturally occurring uranium. Assuming a linear dose-response relationship and a constant nonoccupational uranium intake of 1 Pci/day, then the risk of bone sarcoma induction over a lifetime is estimated to be 1.5×10^{-6} or 1.5 bone sarcomas per million persons (Mays et al. 1985). This is compared to a natural incidence of 750 bone sarcomas in the absence of excess exposure.

Assuming a constant nonoccupational uranium intake rate of 1 pCi/day, an exposure frequency of 365 days/year, and a lifetime of 70 years, then a lifetime uranium intake of nearly 26,000 pCi is

calculated. Using the risk factor from Mays (Mays et al. 1985) and dividing by the calculated lifetime intake, one can derive a risk factor of 5.9×10^{-11} per pCi. A comparison of this risk factor with the cancer slope factors from HEAST for ingestion of U-234, U-235, and U-238 indicates that the ratios of the HEAST values to the former value are 2.4, 2.2, and 2.2, respectively.

Dose-Response Data - Animal Models

The following discussion of experimental data concerning adverse health effects of uranium exposure in animal models is summarized from the report of the BEIR IV Committee on radon and other alpha emitters (NAS 1988). The effect of bone cancer induction is addressed first, followed by the effect of lung cancer induction.

The discussion of human epidemiological evidence presented above identifies the bone surfaces as the most probable target tissue for exposure to uranium, and bone sarcoma as the carcinogenic effect of concern. Radiocarcinogenic effects, including bone sarcoma and head carcinoma, have also been observed in animals and humans from exposure to isotopes of radium, and studies involving exposure of mice to high specific activity U-232 and U-233 have also revealed an increase in bone sarcomas. Soviet researchers have demonstrated that highly enriched uranium, which has a high specific activity, induces bone sarcomas in rats. These results indicate that the intake of high specific activity, alpha-particle-emitting radionuclides increases the risk of these cancers in animals. It would be reasonable to expect high specific activity uranium to induce bone sarcomas in humans; however, the likelihood that low specific activity, naturally occurring uranium induces bone sarcomas is low.

As stated in the discussion of human epidemiological evidence presented above an estimate of the excess risk of bone sarcoma in humans from chronic ingestion of uranium has been developed (Mays et al. 1985). This risk estimate was based on a linear dose-response relationship for Ra-226. Therefore, it was assumed that the response to alpha particles from uranium exposure is similar to the response to alpha particles from Ra-226. This assumption depends in part on the metabolic behavior of uranium relative to radium. There is evidence indicating that uranium seeks bone tissue in a manner similar but not identical to that of radium. U-233 administered to beagle dogs has been shown to initially deposit nonuniformly on bone surfaces; however, redistribution occurred (within approximately one year) to produce a distribution through the bone volume that was similar to the distribution of radium (Stevens et al. 1980). Distribution of uranium throughout the bone volume in

dogs has also been reported by Rowland and Farnham (1969) and Bruenger (personal communication with BEIR IV Committee, 1986 not available in bibliography).

Another concern is the induction of malignant tumors in the lungs from exposure to uranium by inhalation. As previously discussed, uranium emits alpha particles, which can deposit a highly localized radiation dose to sensitive tissues in the passages of the respiratory tract if particulate uranium is deposited in those passageways. The effects of inhaling of insoluble forms of uranium have been studied in rats, dogs, and monkeys for both short and prolonged exposure scenarios (Leach et al. 1970, 1973). The affected sites were the tissues of the lungs and the pulmonary lymph nodes. Chronic inhalation of uranium in these studies produced fibrosis of lung tissue and induction of malignant lung tumors. Data from those studies involving dogs have been reanalyzed (Durbin and Wrenn 1975), leading to the conclusion that neoplastic changes (tumor induction) began in the epithelial cells of the lungs in 21 percent of the dogs after a cumulative lung dose of 160 rads.

Another study exposed rats to U-232 and U-233 (as uranyl nitrate) by inhalation, revealing an increase in malignant lung tumors and bone sarcomas (Ballou et al. 1980). However, the significance of the bone sarcomas (osteosarcomas) is questionable because the rats exposed to control aerosols also developed these tumors. The osteosarcomas are not statistically significant because of their appearance in the control rats. The results of this study of high specific activity U-232 and U-233 uranyl nitrate could lead to the reasonable expectation that such exposure could induce malignant lung tumors in humans. However, the findings of this work do not provide the data needed to convincingly extrapolate a risk coefficient for human exposure.

B.II.2 TOXICITY PROFILES: CHEMICALS

B.II.2.1 2-Methylnaphthalene

Noncarcinogenic Toxicity

Data located regarding the noncancer toxicity of 2-methylnaphthalene are limited to an oral lowest dose associated with lethality (LD_{Lo}) in rats of 5000 mg/kg (Sax 1984). Neither oral nor inhalation RfD or RfC values were located.

Carcinogenicity

Data regarding the carcinogenicity of 2-methylnaphthalene were not located.

B.II.2.2 Acrylonitrile

Toxicity

Short exposures at high concentrations show cyanide-type toxicity. In humans, symptoms include headaches, feelings of nausea, irritability, and apprehension. Prolonged exposure can result in death. Children may be more suspectable to acrylonitrile toxicity than adults. In animals, acrylonitrile has been shown to result in teratogenic effects when administered by either the inhalation or oral routes of exposure. Impaired reproductive capability has also been demonstrated in mice. Epidemiologic studies have associated acrylonitrile exposure in the workplace with increased incidence of lung cancer and possibly prostate cancer. In animals, acrylonitrile has been demonstrated to cause tumors at multiple sites, including the nervous system, gastrointestinal tract, Zymbal gland and mammary gland. Humans exposed to high levels of acrylonitrile in the workplace have complained of nasal irritation and an oppressive feeling in the upper respiratory passages (Wilson, 1944; Wilson et al., 1948, Cited in ATSDR 1990b). Acute exposure of guinea pigs to acrylonitrile has resulted in severe pulmonary irritation and lung edema. In humans, severe cases of acrylonitrile poisoning have resulted in low-grade anemia (Wilson, 1944; Wilson et al., 1948, Cited in ATSDR 1990b). Some liver damage has been reported in humans after acute exposure to high doses. In workers exposed to high levels of acrylonitrile vapors, mild jaundice was diagnosed (Wilson, 1944, Cited in ATSDR 1990b). Direct contact of acrylonitrile with the skin has resulted in erythema, desquamation, and slow healing (Dudley and Neal, 1942, Cited in ATSDR 1990b). Acute effects have been described as being a cyanide-type poisoning (Dudley and Neal, 1942; Vogel and Kirkendall, 1984, Cited in ATSDR 1990b) associated with acrylonitrile poisoning in humans include limb weakness, labored and irregular breathing, dizziness and impaired judgement, cyanosis and nausea, collapse, and convulsions (Baxter, 1979, Cited in ATSDR 1990b). Major metabolic pathways include cyanide and thiocyanate as products of acrylonitrile metabolism (Ahmed et al., 1983; EPA, 1980b; Langvardt et al., 1980; Pilon et al., 1988a, Cited in ATSDR 1990b). The formation of cyanide following oral exposure is greater than inhalation or subcutaneous exposure (Gut et al., 1975, Cited in ATSDR 1990b). Acute exposure of several species of animals have been reported to lead to convulsions and coma (Dudley and Neal, 1942, Cited in ATSDR 1990b). The genotoxicity of acrylonitrile has been extensively studied. Positive results have been observed for all end points evaluated: gene mutations, chromosomal aberrations, DNA damage, and cell transformation. Tests in *Drosophila melanogaster* suggest that acrylonitrile may have the potential for genotoxicity in vivo.

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Carcinogenicity

Studies in rats by inhalation and oral exposure have all demonstrated that acrylonitrile is carcinogenic. Multiple tumor sites have been identified (Bio/dynamics, 1980a, 1980b, 1980c; Quast et al., 1980a, 1980b, Cited in ATSDR 1990b). There is limited evidence that acrylonitrile is a human carcinogen. Exposure to acrylonitrile results in an increased incidence of lung cancer (O'Berg, 1980; O'Berg et al., 1985, Cited in ATSDR 1990b). Acrylonitrile exposure may result in an increased incidence of prostate cancer (Chen et al., 1987; O'Berg et al., 1985, Cited in ATSDR 1990b). EPA has classified acrylonitrile as a probable human carcinogen (EPA, 1988a). There is sufficient evidence in animals to show that acrylonitrile is carcinogenic, but the human evidence is limited.

B.II.2.3 Antimony

Noncarcinogenic Toxicity

Chronic oral exposure studies in animal models include two briefly reported lifetime drinking water studies with potassium antimony tartrate in rats and mice that reported reduced longevity in both species and reduced mean heart weight and altered blood chemistry in the rats (EPA 1992d). A verified chronic oral RfD of 0.0004 mg/kg/day was based on the rat study and an uncertainty factor of 1000.

Chronic effects from occupational exposure include irritation of the respiratory tract, pneumoconiosis, pustular eruptions of the skin called "antimony spots," allergic contact dermatitis, and cardiac effects, including abnormalities of the ECG and myocardial changes (Elinder and Friberg 1986, Cited in ATSDR 1991a). Cardiac effects were also observed in rats and rabbits exposed by inhalation for six weeks, and in animals (dogs and possibly other species) treated by intravenous injection. Inhalation RfC values are not available from the EPA. The heart, respiratory tract, and skin are the principal target organs for antimony.

Carcinogenicity

Data were not located regarding the human carcinogenicity of antimony. Antimony fed to rats did not produce excess tumors (Goyer 1991), but a high frequency of lung tumors was observed in rats exposed by inhalation to antimony trioxide for one year (Elinder and Friberg 1986). The EPA (1991c) has not evaluated the carcinogenicity of antimony.

B.II.2.4 Aroclors

Noncarcinogenic Toxicity

Aroclors-1016, -1221, -1242, -1248, -1254, -1260 are commercially mixtures of polychlorinated biphenyls (PCBs). Target organs for PCBs include the skin, liver, fetus, and neonate. Epidemiologic studies of women in the United States have associated oral PCB exposure with low birth weight or retarded musculoskeletal or neurobehavioral development of their infants (ATSDR 1991). Oral studies in animals have established the liver as the target organ in all species, and the thyroid as an additional target organ in the rat. Effects observed in monkeys included gastritis, anemia, chloracne-like dermatitis, and immunosuppression. Oral exposure in animal models induced developmental effects, including retarded neurobehavioral and learning development in monkeys. Neither verified nor provisional chronic oral RfD values were located for any of the Aroclors.

Occupational exposure to PCBs have been associated with upper respiratory tract and ocular irritation, loss of appetite, liver enlargement, increased serum concentrations of liver enzymes, skin irritation, rashes and chloracne, and in heavily exposed female workers, decreased birth weight of their infants (ATSDR 1991). However, concurrent exposure to contaminants have confounded the interpretation of the occupational exposure studies. Animal models exposed by inhalation to Aroclor-1254 vapors exhibited moderate liver degeneration, decreased body weight gain, and slight renal tubular degeneration. Neither verified nor provisional chronic inhalation RfC values are available.

Carcinogenicity

The EPA (1991c) has classified the PCBs as cancer weight-of-evidence Group B2 substances (probable human carcinogens), based on inadequate data for humans but sufficient data for animals. The human data consists of several epidemiologic occupational and accidental oral exposure studies with serious limitations, including poorly quantified concentrations of PCBs and durations of exposure, and probable exposures to other potential carcinogens (EPA 1992d).

It is known that PCB congeners vary greatly as to their potency in producing biological effects. There is some evidence that mixtures containing more highly chlorinated biphenyls are more potent inducers of hepatocellular carcinoma in rats than mixtures containing less chlorine by weight (EPA 1993a).

The animal data consists of several oral studies in rats and mice with various Aroclors, Kanechlors or Clophens (commercial PCB mixtures manufactured in the United States, Japan, and Germany, respectively) that reported increased incidence of liver tumors in both species (EPA 1992d). The EPA (1991c) has presented a verified oral slope factor of 7.7 per mg/kg/day for all PCBs, based on liver tumors in rats treated with Aroclor-1260.

B.II.2.5 Arsenic

Noncarcinogenic Toxicity

The only noncarcinogenic effects in humans clearly attributable to chronic oral exposure to arsenic are dermal hyperpigmentation and keratosis, as revealed by studies of several hundred Chinese exposed to naturally occurring arsenic in well water (EPA 1992d). Similar effects were observed in persons exposed to high levels of arsenic in water in the western hemisphere. Occupational (predominantly inhalation) exposure was also associated with neurological deficits, anemia, and cardiovascular effects (Ishinishi et al. 1986). The EPA (1991e) has presented an RfD of 0.0003 mg/kg/day for chronic oral exposure, based on a NOAEL from the Chinese data and an uncertainty factor of 1. The principal target organs for arsenic are the skin, nervous system, blood and cardiovascular system.

Carcinogenicity

Inorganic arsenic is clearly a carcinogen in humans (EPA 1992d). Inhalation exposure was associated with increased risk of lung cancer in persons employed as smelter workers, in arsenical pesticide applicators, and in a population residing near a pesticide manufacturing plant. Oral exposure to high levels in well water was associated with increased risk of skin cancer. The EPA (1991c) has classified inorganic arsenic in cancer weight-of-evidence Group A (human carcinogen). An inhalation slope factor of 50 per mg/kg/day, based on absorbed arsenic, was derived from occupational data. Applying an absorption factor of 0.3 yielded an inhalation slope factor of 15 per mg/kg/day, based on an ambient or inhaled dose. The slope factor based on the inhaled, rather than absorbed, dose is the correct parameter to use in risk assessments. Assuming a human inhales 20 m^3 of air per day and weighs 70 kilograms, the EPA (1991c) estimated an inhalation unit risk of 0.0043 $m^3/\mu g$. EPA (1993a) proposed an inorganic arsenic ingestion unit risk of 5.0×10^{-5} per mg/l. The equivalent oral slope factor is 1.75 per mg/kg/day assuming a 70 kg adult ingests 2 liters per day. "The uncertainties associated with ingested inorganic arsenic are such that estimates could be revised downward as much as an order of magnitude, relative to the risk estimates associated with most other carcinogens."

B.II.2.6 Beryllium

Noncarcinogenic Toxicity

Beryllium has a low order of toxicity when ingested because it is poorly absorbed from the gastrointestinal tract (Reeves 1986, Cited in ATSDR 1992b). Occupational exposure has induced dermatitis, acute pneumonitis, and chronic pulmonary granulomatosis (berylliosis). Berylliosis was also observed in humans living in the vicinity of a beryllium plant. Pulmonary effects also occurred in laboratory animals subjected to inhalation exposure. A verified chronic oral RfD value of 0.005 mg/kg/day was based on a NOAEL of 0.54 mg/kg/day in a lifetime drinking water study with beryllium sulfate in the rat, and on an uncertainty factor of 100 (EPA 1991c). The target organs for inhalation exposure appear to be the lungs; target organs for oral exposure are not identified.

Carcinogenicity

The EPA (1991c) has classified beryllium in cancer weight-of-evidence Group B2 (probable human carcinogen), based on inadequate human data but sufficient animal data. The human data consist of occupational studies that weakly associate exposure with increased risk of lung cancer, but confounding variables were not controlled and the studies lacked sensitivity. A significant increase in lung tumors occurred in three strains of rats and in rhesus monkeys subjected to inhalation exposure or intratracheal instillation of a variety of beryllium compounds. Osteogenic sarcomas were induced in rabbits and mice, but not in rats or guinea pigs injected intravenously with various beryllium compounds. Oral studies in animals models yielded inconclusive results. The EPA (1991c) derived an oral slope factor of 4.3 per mg/kg/day from a slight but statistically nonsignificant increase in total tumors in a lifetime drinking water study with beryllium sulfate in the rat. An inhalation unit risk of 0.0024 per $\mu g/m^3$, equivalent to 8.4 per mg/kg/day (assuming humans inhale 20 m^3 of air per day and weigh 70 kilograms), was derived from a human occupational study.

B.II.2.7 Carbazole

Noncarcinogenic Toxicity

Only the oral LD_{50} in rats for carbazole has been located. The oral LD_{50} in rats is reported to be greater than 5000 mg/kg (EPA 1993d).

The EPA has not derived chronic oral and chronic inhalation reference doses for carbazole.

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Carcinogenicity

The EPA has classified carbazole as a cancer weight-of-evidence Group B2 substance (probable human carcinogen) based on liver tumors in mice administered carbazole in the diet. The EPA has derived an oral cancer slope factor of 2 x 10^{-2} mg/kg/day (EPA 1993c).

B.II.2.8 Dieldrin

Toxicity

Dieldrin is toxic to both humans and animals. Clinical observations in humans indicate that the primary symptoms resulting from acute exposure to dieldrin are manifested as neurological and respiratory effects. Dieldrin exposures result in neurological effects which may include central nervous system excitation, convulsions, tremor, ataxia, agitation, nervousness and amnesia. Disturbances of sleep, memory and behavior may persist for several days or weeks after the acute phase of poisoning (Gosselin, 1984, Cited in EPA 1994). In extreme overdoses central nervous system depression and may result in death which arises from respiratory depression. Repeated exposures to spraymen resulted in a syndrome indistinguishable from idiopathic epilepsy which ceased when exposure was terminated (Hayes, W.J. 1957, as cited in EPA, 1994). In addition exposure via ingestion may cause nausea, vomiting and diarrhea. Hematological changes include blood dyscrasia, anemia and leukemia. Dermal exposures result in irritation. Deaths associated with acute dieldrin toxic exposures were not reported.

Carcinogenicity

Dieldrin has been classified as a probable human carcinogen (group B2) based on inadequate human carcinogenicity data and sufficient animal carcinogenicity data (EPA, 1994). Animal carcinogenicity data demonstrates that dieldrin is carcinogenic in both sexes of different strains of mice. Dose response data support these effects as ranging from benign liver tumors, to hepatocarcinomas with transplantation confirmation, to pulmonary metastases. In studies in which tumors resulted, hepatocellular tumors were identified most frequently. Human carcinogenicity data is limited to one retrospective study which reported no statistically significant increases in cancer deaths among 1155 organochlorine pesticide manufacturing workers (Ditraglia, 1981 as cited in EPA 1994). In addition, two studies of workers exposed to aldrin and dieldrin reported no increase in the incidence of cancer. Van Raalte (1977, as cited in EPA, 1994) observed two cases of cancer (gastric and lymphosarcoma) among 166 pesticide manufacturing workers exposed 4-19 years and followed from 15-20 years. However, exposure was not quantified and workers were exposed to other pesticides (endrin and

telodrin). In addition, the population of workers studied was small and the age of the cohort was young and the number of expected deaths was not calculated. Last, the duration of exposure and of latency was relatively short.

B.II.2.9 1,4-Dioxane

Noncancer Toxicity

The acute oral toxicity of 1,4-dioxane is low; $LD_{50/30}$ values in laboratory animals ranged from 2000 to 6000 mg/kg (ACGIH 1991). Repeated oral exposure was associated with severe liver and kidney pathology. Inhalation studies in laboratory animals failed to identify adverse effects. Liver and kidney pathology were observed in workers exposed to high levels in the air. Neither oral nor inhalation RfD or RfC values were located for 1,4-dioxane. The target organs for oral exposure to 1,4-dioxane are the liver and kidney.

Carcinogenicity

Cancer studies consistently associated drinking water exposure of rats to 1,4-dioxane with increased incidence of nasal cavity and liver tumors (EPA 1993a). Drinking water exposure of mice resulted in increased incidence of liver tumors. An inhalation study in rats was negative. Occupational studies are inadequate to implicate 1,4-dioxane as a human carcinogen. On the basis of sufficient evidence for carcinogenicity in animals and inadequate evidence in humans, 1,4-dioxane is classified a cancer weight-of-evidence Group B2 compound (probable human carcinogen). The EPA (1993a) derived an oral slope factor of 0.011 per mg/kg/day, based on carcinomas of the nasal turbinates in orally exposed rats. Risk associated with inhalation exposure was not estimated.

B.II.2.10 Dioxin/Furan

No data were located regarding the pharmacokinetics of the polychlorinated dibenzo-p-dioxins (PCDDs) or (PCDFs) of concern; however, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) has been used as a surrogate for other structurally similar members of these chemical classes. Estimates of the gastrointestinal absorption of TCDD ranged from 50 to 86 percent of the administered dose in rats; comparable data were obtained for rates and hamsters (Fries and Morrow 1975; Nolan et al. 1979; Olson et al. 1983, Cited in ATSDR 1990a). In rats treated dermally with 26 ng TCDD in methanol dermal absorption after 24 hours approximated 40 percent of that absorbed by the gastrointestinal tract after an equivalent dose in ethanol (Poiger and Schlatter 1980, Cited in ATSDR 1990a). Dermal

absorption from vaseline or polyethylene glycol vehicles was substantially less than from methanol, but quantitative estimates cannot be made from the available data.

In rodents given single oral or intrapeitonel doses, or treated for two years with TCDD in the diet, the highest concentrations and greatest tissue depots occurred in the liver, followed closely by adipose tissue (Piper et al. 1973; Poiger and Schlatter 1979; Rose et al. 1975; Kociba et al. 1976, Cited in ATSDR 1990a). Concentrations in other tissues were considerably lower than those in fat. Mouse liver continued to sequester TCDD more efficiently with prolonged exposure (Teitelbaum and Poland 1978, Cited in ATSDR 1990a). In nonhuman primates and guinea pigs, however, greater TCDD concentrations and tissue depots occurred in the adipose tissue than in the liver (Nolan et al. 1979; Van Miller et al. 1976, Cited in ATSDR 1990a). Data obtained at necropsy from one woman potentially exposed to TCDD showed concentrations in adipose tissue about an order of magnitude higher than levels in the liver (Facchetti et al. 1980, Cited in ATSDR 1990a). Radioactivity from intravenous dosing with [^{14}C]2,3,7,8-TCDD has been shown to cross the placenta of rats and mice; concentrations of fetal tissues were lower than in maternal tissues (Moore et al. 1976; Nau and Bass 1981, Cited in ATSDR 1990a).

In rodents and guinea pigs, TCDD was metabolized by microsomal mixed-function oxidase enzymes to hydroxylated derivatives that were conjugated with glucuronide or sulfate for excretion via the bile or urine, respectively (Neal et al. 1982; Olson and Bittner 1983, Cited in ATSDR 1990a). The hydroxylation of several different PCDDs in the rat was postulated to involve formation of arene oxide intermediates (EPA 1985a). In rats, the metabolism of TCDD was inducible but relatively slow, about four orders of magnitude slower than the metabolism of benzo(a)pyrene. There was considerable species variation in the rate of metabolism of TCDD. Studies with [^{14}C],-2,3,7,8-TCDD showed that fecal excretion accounted for 39 to 99 percent of the total (fecal and urinary) excretion of radioactivity (EPA 1985a). Elimination half-lives (assuming first order kinetics) ranged from 11 to 30 days, inversely correlated with species sensitivity to TCDD. There was considerable interspecies variation in the relative importance of fecal versus urinary excretion and in the elimination half-lives.

Noncarcinogenic Toxicity

The only effect in humans clearly attributable to TCDD was chloracne (ATSDR 1989b). The available data, however, also associated exposure to TCDD with hepatotoxicity and neurotoxicity in humans. In animals, TCDD toxicity is most commonly manifested as a wasting syndrome with

thymic atrophy terminating in death, with a large number of organ systems showing nonspecific effects. Chronic treatment of animals with TCDD or a mixture of two isomers of hexachlorodibenzo-p-dioxin resulted in liver damage. Immunologic effects may be among the more sensitive endpoints of exposure to the PCDDs in animals. TCDD is a developmental and reproductive toxicant in animal models. Data were not located regarding the noncarcinogenic toxicity of unsubstituted dibenzofuran or the other PCDFs. No verified or provisional noncarcinogenic toxicity values were located for any of the chemicals of concern in these classes (EPA 1992b, 1992c).

Carcinogenicity

Data regarding the humans carcinogenicity of TCDD obtained from epidemiologic studies of workers exposed to pesticides or to other chlorinated chemicals known to be contaminated with TCDD, are conflicting (ATSDR 1989b). The interpretation of these studies is clouded, because exposure to TCDD was not quantified, multiple routes of exposure (dermal, inhalation, oral) were involved, and the workers were exposed to other potentially carcinogenic compounds. TCDD, however, is clearly carcinogenic in animal models, inducing thyroid, lung, and liver tumors in orally treated rats and mice (EPA 1985a). Similarly, oral treatment with a mixture of two hexachlorodibenzo-p-dioxin isomers induced liver tumors in rats and mice. On the basis of the animal data, TCDD and the hexachlorodibenzo-p-dioxins were assigned to EPA cancer weight-of-evidence Group B2 (probable human carcinogen). Although the PCDDs and PCDFs of concern were not classified, they are treated as probable human carcinogens, for which slope factors are derived.

The EPA (1992b) has presented provisional oral and inhalation slope factors for TCDD of 150,000 per mg/kg/day, based on the incidence of liver and lung tumors in an oral study in rats (Kociba et al. 1978). In the absence of satisfactory congener-specific cancer data, the EPA (1989g) derived toxicity equivalency factors (TEFs) for the other PCDDs and PCDFs, by assuming that all manifestations of toxicity for all members of these classes are mediated by a common mechanism (i.e., binding to the intraculluar AH receptor of target cells). For polychlorinated dibenzo-p-dioxin and polychlorinated dibenzofurans; 2,3,7,8-TCDD toxicity equivalents will be calculated using the appropriate 1-TEFs/89 Toxicity Equivalent Factors (EPA 1989g). Table B.II.2-10-1 presents the TEFs developed by EPA.

Considerable uncertainty surrounds the carcinogenic potential of the PCDDs and PCDFs of concern. Although TCDD is classified as a weight-of-evidence Group B2 substance, the homologues of concern are not classified. The appropriateness of estimating cancer potency of (i.e., regulating as

carcinogens) compounds not assigned to a cancer weight-of-evidence group is questionable (EPA 1986b).

TABLE B.II.1-10-1

DIOXIN AND FURAN TOXICITY EQUIVALENCY FACTORS

Compound	TEF
Dioxins	
2,3,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	0.01
Other HpCDDs	0
Octachlorodibenzo-p-dioxin (OCDD)	0.001
Furans	
2,3,7,8-Tetrachlorodibenzo-p-furan (TCDF)	0.1
Other TCDFs	0
2,3,7,8-Heptachlorodibenzo-p-furans (HpCDFs)	0.01
Other HpCDFs	0

SOURCE: EPA 1989h

There is uncertainty about the slope factor for TCDD. Additional uncertainty is introduced by the use of the TEFs themselves, most of which were derived not from cancer data, but from in vitro data such as enzyme induction, which is only hypothetically related to a carcinogenic role. For example, the TEF of 0.001 for octachlorodibenzo-p-dioxins (OCDDs) and octachlorodibenzofurans (OCDFs) is based on the appearance of "dioxin-like" effects and detectable levels of OCDD late in a 13-week study of male rats treated with OCDD (Couture et al. 1988) and on in vitro evidence of enzyme induction (EPA 1989g). Before the Couture et al. (1988), paper was available, the TEF for these homologues, based on limited in vivo and in vitro data, was 0.0.

B.II.2.11 Endosulfan/Endosulfan Sulfate

Toxicity

No acute inhalation MRL was derived for endosulfan based on animal data because the most sensitive effects observed after acute inhalation exposure were trembling and ataxia in rats exposed to 2.6 mg/m^3 for four hours (Hoechst, 1983, Cited in ATSDR 1991b). These effects are considered by ATSDR to be serious effects, and MRLs are not derived using NOAELs or LOAELs for serious end

points. No acute-, intermediate-, or chronic-duration dermal MRLs were derived for endosulfan because of the lack of an appropriate methodology for the development of dermal MRLs. No acute-duration oral MRL was derived for endosulfan because no suitable end point was available among the reliable acute-duration studies. The lowest LOAEL was for a serious end point [1.8 mg/kg-day, for convulsions in pregnant rabbits appearing 10 days after the start of daily gavage dosing in the FMC (1981, Cited in ATSDR 1991b) study]. The clinical signs common to both humans and animals after acute exposure to high doses of endosulfan (e.g., hyperactivity, tremors, decreased respiration, dyspnea, salivation, tonic-clonic convulsions, and death) point to the nervous system as the major target of toxicity. Target organs of endosulfan identified in experimental animals but not humans include the gastrointestinal tract, blood, liver, kidney, reproductive organs, and immune system. Effects observed on the respiratory and cardiovascular systems are most likely secondary to effects of endosulfan on the central nervous system control of respiratory and cardiovascular function. Very few studies have examined the toxicity of endosulfan following inhalation or dermal exposure in humans or animals, but the effects reported (e.g., central nervous system stimulation and hepatic and renal effects) are similar to those seen after oral exposure. A major metabolite of endosulfan, endosulfan sulfate, which is also found at some hazardous waste sites, is reported to have similar toxicity (WHO, 1984, Cited in ATSDR 1991b). Endosulfan has been fatal to humans following accidental and intentional ingestion of concentrated endosulfan solutions (Bernardelli and Gennari, 1987; Demeter and Heyndrickx, 1978; Terziev et al., 1974, Cited in ATSDR 1991b). Death has also been observed in animals following inhalation (Hoechst, 1983a, Cited in ATSDR 1991b), oral (Boyd and Dobos, 1969; Boyd et al., 1970; Chatterjee et al., 1986; FMC, 1958; 1980a, 1980b; Gupta et al., 1978, 1981; Hoechst, 1966a, 1966b, 1970, 1975, 1988a, Cited in ATSDR 1991b), and dermal (Gupta and Chandra, 1975; Hoechst, 1989b; Nicholson and Cooper, 1977, Cited in ATSDR 1991b) exposure to endosulfan, but no such cases have been reported in humans following inhalation or dermal exposures. Death in humans and animals is generally attributed to respiratory arrest following convulsive seizures. Endosulfan is not readily water soluble. The oral LD_{50} values reported for technical-grade endosulfan vary depending on the species, sex, formulation tested, vehicle used, and nutritional status of the animal (Boyd and Dobos, 1969; Boyd et al., 1970; Gupta, 1976; Gupta and Gupta, 1979; Hoechst, 1990, WHO, 1984, Cited in ATSDR 1991b). Outward signs of acute endosulfan toxicity are similar among species and are generally associated with endosulfan's effects on the central nervous system. Symptoms include hyperexcitability, dyspnea, decreased respiration, and fine tremors followed by tonic-clonic convulsions. Mice generally appear to be more sensitive to the lethal effects of endosulfan than rats (Gupta, 1976; Gupta et al., 1981, Cited in ATSDR 1991b).

Female rats are more sensitive to the lethal effects of endosulfan than male rats (Gupta, 1976; Hoechst, 1990, Cited in ATSDR 1991b). Cardiovascular effects, such as tachycardia and hypertension, followed by cardiogenic shock, increased cardiac output, and an increase in total peripheral resistance, have been observed in humans and animals following acute, high-level exposure to endosulfan (Anand et al., 1980a, 1981; Shemesh et al., 1988, Cited in ATSDR 1991b). Systemic congestion consistent with acute heart failure has been observed in short-term, high-dose studies (Gupta and Chandra, 1977; Hoechst, 1970, Cited in ATSDR 1991b). These effects are only seen at doses that evoke convulsions, indicating that the cardiovascular effects are a result of increased central sympathetic nervous system activity. Gagging, vomiting, and/or diarrhea in humans and animals have been reported following acute, high-level oral exposure to endosulfan (FMC, 1958, 1959a; Hoechst, 1989b; Terziev et al., 1974, Cited in ATSDR 1991b). There have been no reports of renal toxicity associated with acute inhalation exposure to endosulfan in laboratory animals. Acute oral and dermal exposure to endosulfan has been reported to cause damage to the kidneys of rats, rabbits, and dogs (FMC, 1958, 1980a; Gupta and Chandra, 1975; Hoechst, 1970; Terziev et al., 1974, Cited in ATSDR 1991b). The most prominent signs of acute exposure to high concentration of endosulfan in humans are hyperactivity, tremors, decreased respiration, dyspnea, salivation, and tonic-clonic convulsions. These effects have been observed in cases of occupational overexposure as well as following intentional or accidental ingestion of large amount of endosulfan. Autopsies performed in three cases of lethal exposure to endosulfan in humans revealed brain edema (Terziev et al., 1974, Cited in ATSDR 1991b). Long-term brain damage has also been associated with occupational endosulfan intoxicant (Aleksandrowicz, 1979, Cited in ATSDR 1991b). The brain damage may have been a result of a direct action of endosulfan on the brain tissue or the hypoxia that accompanied seizures. Signs of acute endosulfan intoxication similar to those reported in humans have been observed in animals. Cerebral congestion and edema is often observed at necropsy in animals that die following acute ingestion of endosulfan (Boyd and Dobos, 1969; Boyd et al., 1970; Teziev et al., 1974, Cited in ATSDR 1991b).

Carcinogenicity

No reports of cancer in humans associated with exposure to endosulfan have been found. The later studies by Hoechst (1988b, 1989a, Cited in ATSDR 1991b) show no evidence of increased neoplasms in rats or mice chronically exposed to endosulfan. Consumption of 3.8 mg/kg-day (females) or 2.9 mg/kg-day (males) by Sprague-Dawley rats for 2 years did not result in an increased incidence of any neoplastic lesion (Hoechst, 1989a, Cited in ATSDR 1991b).

B.II.2.12 Ethylbenzene

Toxicity

Toxicity data specific to 1,2-diethylbenzene could not be located, however, data for ethylbenzene are presented. Ethylbenzene is toxic to both humans and laboratory animals. Clinical observations in humans and observations in animals indicate that the primary symptoms resulting from acute exposure to ethylbenzene are manifested as neurological and respiratory depression and eye and throat irritation. Target organs of ethylbenzene toxicity, identified in animals but not in humans, may be the liver, kidney, and hematopoietic system. The exposure route of most concern to the general public would be low-level inhalation exposure over long periods of time. This is due to the direct release of ethylbenzene into the air by burning of fossil fuels or industrial processes and partitioning into the air from other media (e.g., soil, surface water). No deaths have been reported in humans following ethylbenzene exposure, but death has occurred in laboratory animals following acute exposure to high levels of ethylbenzene administered via the inhalation, oral, and dermal routes. The concentrations of ethylbenzene necessary to cause death in animals have been shown to be relatively high (1,200 - 13,367 ppm, inhalation exposure; 4,728 mg/kg-day, oral exposure; 15,415 mg ethylbenzene/kg body weight, dermal exposure). The principal effect in humans exposed via inhalation to high concentrations of ethylbenzene has been central nervous system toxicity (dizziness, vertigo) (Yant et al., 1930). There is considerable likelihood that human populations acutely exposed to high concentrations of ethylbenzene are at risk for developing neurological effects.

Carcinogenicity

No association between increased cancer incidence in humans and exposure to ethylbenzene has been reported in current literature. The only chronic bioassay located in the literature showed a significant increase in tumors in rats orally exposed to ethylbenzene (Maltoni et al., 1985, Cited in ATSDR 1993). These results; however, are inconclusive given the weaknèss of the study. In the 1989 Integrated Risk Information System (EPA, 1989) database, EPA has classified ethylbenzene as a Group D agent (Not Classifiable as to Carcinogenicity). No potency factor (q_1*) or other quantitative estimate of carcinogenicity has been developed by EPA for ethylbenzene.

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B.II.2.13 Lead

Noncarcinogenic Toxicity

The noncarcinogenic toxicity of lead has been well characterized through decades of medical observation and scientific research (EPA 1993d). The primary effects of long-term exposure to levels expected to be encountered in the environment are neurological and hematological. Some of the effects on the blood, particularly changes in levels of certain blood enzymes, and subtle neurobehavioral changes in children appear to occur at levels so low as to be considered nonthreshold effects. In part for this reason the RfD/RfC Work Group considered inappropriate the derivation of an RfC or RfD for inhalation exposure, or an RfD for oral exposure (EPA 1993d). The principal target organs of lead are the central nervous system and the hematopoietic system.

The EPA has developed an uptake/biokinetic model to predict blood lead levels in populations exposed to lead in air, diet, drinking water, indoor dust, soil and paint. This makes it possible to evaluate the effects of regulatory decisions concerning each medium on blood lead levels and potential health effects. The model is used to estimate lead uptake and subsequent blood lead levels in young children, who are the most sensitive subpopulation for exposure to lead. It accepts user input of variables pertaining to site-specific exposure to lead through air, diet, water, soil, dust, and paint (EPA 1990h). In the absence of data on site-specific residential exposure variables, this model is not applicable to Operable Unit 2.

OSWER Directive No. 9355.4-02 (EPA 1989g) established a soil cleanup level for lead of 500 to 1000 ppm, based on recommendations by the Centers for Disease Control designed to protect children from blood lead concentrations above background, which are associated with lead-induced neurological effects. In the absence of current measures of residential exposure and other site-specific variables, the OSWER directive (EPA 1989g) appears to be the soundest and most defensible basis for evaluating the toxicity of exposure to lead in soil.

Carcinogenicity

Lead is assigned to cancer weight-of-evidence Group B2 (probable human carcinogen), based on inadequate human evidence but sufficient animal evidence (EPA 1993d). Rat and mouse bioassays have shown statistically significant increases in renal tumors following dietary and subcutaneous exposure to several soluble lead salts. The EPA has declined to quantitatively estimate risk for oral exposure to lead because many factors (i.e., age, general health, nutritional status, existing body

burden, and duration of exposure) influence the bioavailability of ingested lead, introducing a great deal of uncertainty into any estimate of risk.

B.II.2.14 Polycyclic Aromatic Hydrocarbons

Toxicity

A single exposure to PAHs has been associated with a number of toxic effects, including initiation of carcinogenicity. The acute lethal toxicity of PAHs ranges from 250 mg/kg for the most potent to 700 mg/kg for the least potent. However, most exposure situations will involve a mixture of PAHs; and, it is not possible to tell whether the acute lethal toxicity for a mixture will lie somewhere in between these values or whether toxicity will be additive. In addition, these data were obtained following parenteral administration, a step which by-passes metabolism in the liver; therefore, their relevance to human exposure is questionable.

Carboxylesterase activity of the intestinal mucosa was decreased in rats following intragastric administration of 50 or 150 mg/kg/day benzo(a)anthracene or benzo(a)pyrene for 4 days; enzyme activity was increased following oral exposure to 100 mg/kg/day of anthracene or phenanthrene (Nousiainen et al., 1984 cited in ATSDR, 1990d).

Bone marrow depression (aplastic anemia and pancytopenia) leading to death was observed in mice whose AHH enzyme was not inducible following oral administration of 120 mg benzo(a)pyrene/kg/day for 180 days (Robinison et al., 1975 cited in ATSDR, 1990d).

A number of hepatic effects (enzyme and foci induction, liver regeneration and increased weights) have been observed in animals administered PAHs. These effects are not life-threatening but may precede the onset of more serious effects. A single intragastric administration of 200 mg/kg of benzo(a)pyrene, benzo(a)anthracene or dibenz(a,h)anthracene induced the formation of preneoplastic hepatocytes in a promotion/initiation bioassay in partially hepatectomized rats fed 2-acetylaminofluorene (Tsuda and Farber, 1980 cited in ATSDR, 1990d). PAHs stimulate liver regeneration in partially hepatectomized rats following administration in the diet for 10 days. Non-carcinogenic PAHs required higher doses (Gershbein, 1975 cited in ATSDR, 1990d).

Dermal exposure to benzo(a)pyrene in humans was associated with epidermal changes indicative of neoplastic proliferation, chronic dermatitis and hyperkeratosis or exacerbation of pre-existing skin

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lesions (Cottini and Mazzone, 1939; EPA, 1988 cited in ATSDR, 1990d). Topical application of PAHs have been associated with adverse effects in animals including skin cancer, effects on sebaceous glands, increased number of skin melanocytes, dermal inflammation, allergic contact hypersensitivity and photosensitization (Bock and Mund, 1958; Iwata et al., 1981 Klemme et al., 1987; Old et al., 1963 and Forbes et al., 1976 cited in ATSDR, 1990d).

Immunotoxic effects have been observed following dermal and parenteral administration in animals. PAHs that are carcinogenic are also immunosuppressive with the same rank order of potency (ATSDR, 1990d). Effects observed have included inhibition of T-cell dependent and independent antibody production and inhibition of lymphocyte mediated immunity, (Blanton et al., 1986; Lyte and Bick, 1985; Whit and Holsapple, 1984; Wojdani et al., 1984 cited in ATSDR, 1990d).

There is no information on the developmental effects of exposure to PAHs in humans (ATSDR, 1990d).

In animals, in utero exposure to benzo(a)pyrene (10, 40, or 160 mg/kg/day orally during gestation) was associated with reduced mean postnatal pup weight and increased incidence of sterility associated with alterations in gonadal morphology and germ-cell development in male mice (Mackenzie and Angevine, 1981 cited in ATSDR, 1990d). An observed increased incidence of stillborns, resorptions and malformations following dietary administration of 120 mg benzo(a)pyrene/kg/day to the dam was associated with the metabolic responsiveness of the offspring and the dams (Legraverend et al., 1984 cited in ATSDR, 1990). Parental administration of a number of PAHs has been associated with a number of developmental effects: stillbirths, increased fetal resorptions, malformations, adverse gonadal histology, decreased fetal survival.

There is no information on the effect of PAH on reproduction in humans (ATSDR, 1990d).

Benzo(a)pyrene decreased the percentage of pregnant females at parturition in pregnant CD-1 mice (Mackenzie and Angevine, 1981 cited in ATSDR, 1990d) and reduced the incidence of pregnancy in rats (Rigdon and Rennels, 1964 cited in ATSDR 1990d) but had no effect on fertility of Swiss mice (Rigdon and Neal, 1965 cited in ATSDR, 1990d). Decreased number of corpora lutea, uterine weights and fetal survival and increased resorptions were observed following parenteral administration

of benzo(a)pyrene (Swartz and Mattison, 1985; Bui et al., 1986 cited in ATSDR, 1990d). The implications of the results obtained following parenteral administration, which by-passes first-pass metabolism of the liver, to human exposure are that adverse effects on reproduction are possible.

A number of PAHs have been tested in numerous in vitro and in vivo genotoxicity studies (ATSDR, 1990d). In general, several PAHs demonstrated genotoxic potential that required metabolic activation. Benzo(a)pyrene produced several genotoxic effects: DNA binding/damage, sister chromatic exchange, chromosomal aberration, cell transformation; effects were observed in bacterial and mammalian (both somatic and germ) cells. DNA damage was also observed in human cells. Acenaphthene, acenaphthylene or fluorene were negative for genotoxic effects and anthracene, phenanthrene and pyrene where negative in all but one in vitro test.

Epidemiologic studies of humans exposed to coke-oven and roofing-tar emissions and cigarette smoke have demonstrated an increase in mortality due to lung cancer (Lloyd, 1971; Mazumdar et al., 1975; Redmond et al., 1976; Hammond et al., 1976; cited in ATSDR, 1990d). Skin tumors have been reported among individuals exposed to mixtures containing PAHs: scrotal cancer among chimney sweeps and skin cancer following exposure to shade oils (Pott, 1775; Purde and Etlin, 1980 cited in ATSDR, 1990d). While these mixtures contain PAHs they also contain a number of other potentially carcinogenic chemicals, tumor promoters, initiators and cocarcinogens. This concomitant exposure prevents making a direct causal relationship to PAHs.

Inhalation, oral and dermal exposure to PAHs have been associated with carcinogenic effects in animals (ATSDR, 1990d). These studies suggest that the site of tumor induction is influenced by the route of administration. Following inhalation exposure an increased incidence of respiratory tract tumors was observed. Benign and malignant tumors, adenomas, papillomas, neoplasms, and carcinomas of the lung, alimentary tract (particularly the forestomach), and mammary glands were observed following ingestion of benzo(a)pyrene, benzo(a)anthracene and dibenz(a,h)anthracene by rodents. A dose-responsive increase in the incidence of forestomach papillomas and carcinomas was observed in mice following dietary administration of 33.3 mg benzo(a)pyrene/kg/day for 30 - 197 days (Neal and Rigdon, 1967 cited in ATSDR, 1990d). The overall evidence suggests exposure to a PAHs are associated with an increased risk of cancer. Benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene have been demonstrated to induce skin tumors in mice following dermal exposure (ATSDR, 1990d). Benzo(a)pyrene, in

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particular, is a potent experimental skin carcinogen. It is often used as a positive control in carcinogenesis bioassays. The dose-response relationship of benzo(a)pyrene and skin tumors has been investigated in a number of studies (Cavalieri et al., 1988; Shubik and Porta, 1957; Bingham and Falk, 1969; Wynder and Hoffman, 1959; Warshawsky and Barkley, 1987 cited in ATSDR, 1990d). Benzo(a)pyrene has been demonstrated to induce malignant skin tumor at exposures as low as 0.0054 mg/kg/day; however, the solvent and strain of mouse tested will influence the tumorigenic dose (Bingham and Falk, 1969; Warshawsky and Barkley, 1987 cited in ATSDR, 1990d).

B.II.2.14.1 Pyrene

Mice administered intraperitoneal injections of pyrene on days 1, 8, and 15 of age did not demonstrate a treatment-related increase in tumor incidence (Wislocki et al., 1986 cited in IRIS, EPA 1993d). Pyrene was not positive or inconclusive in mouse skin-painting assays (Badger et al., 1940; Horton and Christian, 1974; Van Duuren and Goldschmidt, 1976; Salaman and Roe, 1956; Scribner, 1973 cited in IRIS, EPA 1993d). Subcutaneous injection of pyrene did not produce tumors in Jackson A mice (Shear and Leiter, 1941 cited in IRIS, EPA 1993d). The EPA has classified pyrene as a class D carcinogen; not classifiable as to human carcinogenicity due to no human data and inadequate data from animal bioassays.

Reference Dose

The US FDA has established as RfD of 3E-2 based on administration of 0, 75, 125, or 250 mg/kg/day pyrene by oral intubation for 13 weeks (EPA, 1989). Minimal to mild nephropathy (renal tubular pathology and decreased kidney weights) was observed; the dose relationship was moderate. The uncertainty factor was 3000 due to species variability and lack of additional toxicity studies. The overall confidence in the RfD is low due to gaps in the database.

B.II.2.14.2 Benzo(k)fluoranthene

In a lifetime study in female rats, lung implants of 0.65, 3.4, or 17 mg/kg benzo(k)fluoranthene exhibited a dose-related increase in the incidence of epidermoid carcinomas in the lung and thorax. Equivocal incidences of lung adenomas and hepatic adenomas and hepatomas were reported in mice administered intraperitoneal injections of 120 μg benzo(k)fluoranthene/mouse on days 1, 8, 15 of age (LaVoie et al., 1987 cited in IRIS, EPA 1993d). Benzo(k)fluoranthene was positive in mouse skin-painting assays (Van Duuren et al., 1966; LaVoie et al., 1982; Amin et al., 1985 cited in IRIS, EPA

1993d). Based on these data, EPA has classified benzo(k)fluoranthene as B2 "probable" human carcinogen.

B.II.2.14.3 Benzo(b)fluoranthene

In a lifetime study in female rats, lung implants of 0.4, 1.2, or 4.1 mg/kg benzo(b)fluoranthene exhibited a dose-related increase in the incidence of epidermoid carcinomas and pleomorphic sarcoma in the lung and thorax. Equivocal incidences of lung adenomas and hepatic adenomas and hepatomas were reported in mice administered intraperitoneal injections of 126 μg benzo(b)fluoranthene/mouse on days 1, 8, 15 of age (LaVoie et al., 1987 cited in IRIS, EPA 1993d). Injection site sarcomas were observed in mice administered subcutaneous injections of benzo(b)fluoranthene (2.6 mg total dose) over 2 months (Lacassagne et al., 1963 cited in ATSDR, 1990). Benzo(b)fluoranthene was positive for complete carcinogenesis and initiation in mouse skin-painting assays (Wynder and Hoffmann, 1959; LaVoie et al., 1982; Amin et al., 1985 cited in IRIS, EPA 1993d). Based on these data, EPA has classified benzo(k)fluoranthene as B2 "probable" human carcinogen.

B.II.2.14.4 Benzo(a)pyrene

There are multiple animal studies demonstrating increased incidence of carcinogenic effects following oral, intratracheal, inhalation and dermal administration of benzo(a)pyrene. Benzo(a)pyrene has been shown to be an initiator and a complete carcinogen following dermal application (IARC, 1973 cited in IRIS, EPA 1993d). A dose-responsive increase in squamous cell papillomas and carcinomas of the forestomach was observed following oral administration of 1 - 250 ppm benzo(a)pyrene to rats and hamsters for 197 days (Rigdon and Neal, 1966, 1969 cited in IRIS, EPA 1993d). The incidence of respiratory tract and upper digestive tract tumors were increased following intratracheal instillation or inhalation of benzo(a)pyrene by guinea pigs, hamsters and rats (EPA, 1991 cited in IRIS, EPA 1993d). Inhalation exposure of hamsters to benzo(a)pyrene at 9.5 mg/cubic m/day for 10 weeks was associated with development of tumors of the nasal cavity, larynx, trachea and pharynx. At the next highest dose, 45 mg/m^3/day, neoplasms were also observed in the upper digestive tract. The lowest dosed, 2.2 mg/m^3/day, animals did not develop tumors (Thyssen et al., 1981 cited in IRIS, EPA 1993d). Intraperitoneal and subcutaneous injection of benzo(a)pyrene is associated with injection site tumors (EPA, 1991 cited in IRIS, EPA 1993d). Based on no human data and sufficient animal data benzo(a)pyrene is classified, B2; probable human carcinogen. EPA has calculated an oral slope factor of 5.8 per(mg/kg)/day and an inhalation slope factor of 6.1 (mg/kg-day)$^{-1}$. These slope factors are utilized in the quantification of risk of all carcinogenic PAHs (EPA 1992b).

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B.II.2.14.5 Acenaphthylene

Dermal application of acenaphthylene (0.25%) did not cause tumor development in a lifetime study in mice (Cook, 1932). While no control was used in this study other PAHs tested did result in skin tumor formation. EPA has classified acenaphthylene as a class D carcinogen; not classifiable as to human carcinogenicity (IRIS, EPA 1993d).

B.II.2.14.6 Phenanthrene

Two skin painting assays were negative for complete carcinogenic activity; 1 out of 5 mouse skin painting assays was positive for initiation (IRIS, EPA 1993d). Tumorigenic activity was not detected following intraperitoneal injection of phenanthrene (0.25 mg total dose) on days 1, 8, and 15 after birth (Buening et al., 1979 cited in IRIS, EPA 1993d). A single subcutaneous injection of 40 μg phenanthrene in albino mice was not overtly tumorigenic (Grant and Roe, 1963 cited in IRIS, EPA 1993d). No tumors were reported in mice receiving a single subcutaneous injection of 5 mg phenanthrene (Steiner 1955 cited in IRIS, EPA 1993d). EPA has classified phenanthrene as a class D carcinogen; not classifiable as to human carcinogenicity.

B.II.2.14.7 Benzo(a)anthracene

Increased incidence of pulmonary tumors and hepatomas was observed mice following oral gavage with 500 mg benzo(a)anthracene/kg/day 3 times/week for 5 weeks (Klein, 1963 cited in IRIS, EPA 1993d). A single gavage dose of 0.5 mg benzo(a)anthracene was not tumorigenic while multiple gavage treatments (8 or 16 over 16 months) resulted in forestomach papillomas (Bock and King, 1959 cited in IRIS, EPA 1993d). Following intraperitoneal injection of benzo(a)anthracene on days 1, 8, and 15 of age (638 ug/mouse total dose) the incidence of liver adenomas or carcinomas was increased in treated male mice while the incidence of pulmonary adenomas or carcinomas was increased in treated females (Wislocki et al., 1986 IRIS, EPA 1993d). Benzo(a)anthracene was positive as a complete carcinogen and as an initiator in mouse skin painting bioassays (IARC, 1973 cited in IRIS, EPA 1993d). Injection site sarcomas were observed following subcutaneous or intramuscular injection of benzo(a)anthracene (Steiner and Falk, 1951; Steiner and Edgecomb, 1952; Klein, 1952 cited in IRIS, EPA 1993d). EPA has classified benzo(a)anthracene as a B2 "probable" human carcinogen.

B.II.2.14.8 Naphthalene

No treatment-related tumors developed in rats fed a diet supplemented with 360 mg naphthalene/kg/day (total dose administered was 10 g/rat) (Schmahl, 1955 cited in IRIS, EPA 1993d). Pulmonary tumors developed in mice following inhalation exposure to 0, 10, or 30 ppm naphthalene for 6 hours/day, 5 days/week for 6 months; no dose-response was observed (Adkins et al., 1986 cited in IRIS, EPA 1993d). The number of gamma-glutamyl transpeptidase positive foci, an early neoplastic indicator, was not increased following single gavage administration of 100 mg naphthalene/kg (Tsuda et al., 1980 cited in IRIS, EPA 1993d). No carcinogenic responses were observed in rats after intraperitoneal injection of 20 mg naphthalene/kg once a week for 40 weeks (Schmahl, 1955 cited in IRIS, EPA 1993d). Naphthalene was negative as a complete carcinogen or initiator in mouse skin-painting assays (Kennaway, 1930; Schmelts et al., 1978 cited in IRIS, EPA 1993d). EPA has classified naphthalene as a class D carcinogen.

B.II.2.14.9 Benzo(g,h,i)perylene

Benzo(g,h,i)perylene was negative as a complete carcinogen or and initiator in mouse skin painting assays (IRIS, EPA 1993d). Rats with benzo(g,h,i)perylene lung implants did not develop increased incidence of epidermoid carcinomas in the lung or thorax (Deutsch-Wenzel et al., 1983, Cited in IRIS, EPA 1993d). Mice injected subcutaneously with 0.1, 1, or 10 mg benzo(g,h,i)perylene once every 2 weeks for 20 weeks did not develop tumors (Muller, 1968 cited in IRIS, EPA 1993d). EPA has classified benzo(g,h,i)perylene as a class D carcinogen.

B.II.2.14.10 Chrysene

Chrysene tested positive as a complete carcinogen and an initiator in mouse skin painting studies (IRIS, EPA 1993d). The incidence of liver adenomas or carcinomas and lung adenomas was increased in male, but not female, mice administered intraperitoneal injections of chrysene on days 1, 8, and 15 of age (total dose was 160 or 640 ug/mouse) (Wislocki et al., 1986 cited in IRIS, EPA 1993d). Intraperitoneal injection of chrysene on days 1, 8, and 15 of birth resulted in increased incidence of hepatic tumors in treated male mice and not treated females (Chang et al., 1983, Cited in IRIS, EPA 1993d). Based on these data, EPA has classified chrysene as a B2 "probable" human carcinogen.

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B.II.2.14.11 Fluoranthene

Fluoranthene was consistently negative as a complete carcinogen in mouse skin painting studies (IRIS, EPA 1993d). EPA has classified fluoranthene as a class D carcinogen.

Reference Dose

The US FDA has established an RfD of 4E-2 based on gavage administration of 0, 125, 250, or 500 mg/kg/day fluoranthene to mice for 13 weeks. The mid and high dose mice exhibited nephropathy, a dose-dependent increase in liver enzymes and weights, and increased salivation. The uncertainty factor was 3000 due to species variability, the use of a subchronic study and lack of additional toxicity data. The overall confidence in the RfD is low due to gaps in the database.

B.II.2.15 Thallium, Soluble Salts

Noncarcinogenic Toxicity

Thallium is highly toxic; acute ingestion in humans or laboratory animals induces gastroenteritis, neurological dysfunction, and renal and liver damage (Kazantzis 1986). Chronic ingestion of more moderate doses characteristically causes alopecia. Thallium was once used medicinally to induce alopecia in cases of ringworm of the scalp, sometimes with disastrous results. In industrial exposure (inhalation, oral, dermal), neurologic signs precede alopecia, suggesting that the nervous system is more sensitive than the hair follicle. The EPA (1991c) has derived a chronic oral RfD of 8×10^{-5} mg/kg/day based on increased incidence of alopecia and increased serum levels of liver enzymes indicative of hepatocellular damage in rats treated with thallium sulfate for 90 days. An uncertainty factor of 3000 was used. Chronic oral RfDs have also been developed for thallium acetate, thallium carbonate, thallium selenite, thallium chloride and thallium mononitrate based on the study performed with thallium sulfate. These oral RfDs are calculated by analogy to thallium sulfate by correcting for molecular weight differences. These RfDs range from 8×10^{-5} to 9×10^{-5} mg/kg/day. Target organs for thallium include the gastrointestinal tract (acute exposure), central nervous system, skin, kidneys and liver.

Carcinogenicity

The EPA (1991c) has assigned several thallium compounds (thallium acetate, thallium carbonate, thallium chloride, thallium nitrate, and thallium sulfate) to cancer weight-of-evidence Group D (not classifiable as to carcinogenicity to humans).

B.II.2.16 Tributyl Phosphate

Noncancer Toxicity

Tributyl phosphate exhibits rather low acute oral toxicity; the oral single-dose $LD_{50/30}$ in rats was 3000 mg/kg (ACGIH 1986). The compound is a weak cholinesterase inhibitor and induces paralysis and anesthesia, as well as lung edema, when given orally or parenterally (ACGIH 1986; Sandmeyer and Kirwin 1981). Irritation of the skin and mucous membranes and lung edema results from inhalation exposure. Occupational exposure to 15 mg/m^3 was associated with headache and nausea.

Carcinogenicity

Data were not located regarding the carcinogenicity of tributyl phosphate. However, the compound was negative for mutagenicity in Salmonella and Drosophila.

B.II.2.17 1,1,2-Trichloro-1,2,2-trifluoroethane

Noncancer Toxicity

The acute oral toxicity of 1,1,2-trichloro-1,2,2-trifluoroethane is low (ACGIH 1986). Occupational exposure to moderate levels was not associated with adverse effects, although acute exposure to grossly high levels was implicated in several dry-cleaning fatalities. CNS effects were observed in humans exposed to high levels. Inhalation exposure to very high levels in animals sensitized the heart to epinephrine, resulting in serious cardiac arrhythmia. The EPA (1993a) presented a verified chronic oral RfD of 30 mg/kg/day based on an NOAEL from an occupational study and an uncertainty factor of 10. The EPA (1992b) presented a provisional subchronic oral RfD of 3 mg/kg/day, based on an NOEL in an inhalation study in rats and an uncertainty factor of 100. It is clear that the provisional subchronic oral RfD is inappropriate because it implies that the toxic potency of subchronic exposure is greater than the toxic potency of chronic exposure. For this reason, the chronic oral RfD of 30 mg/kg/day is adopted as sufficiently protective for subchronic exposure. The EPA (1992b) also presented 27 mg/m^3 as a provisional subchronic and chronic inhalation RfC, based on the rat inhalation data and an uncertainty factor of 100. The inhalation RfC is equivalent to 8 mg/kg/day, assuming an inhalation rate of 20 m^3/day and a body weight of 70 kg for humans. Target organs for inhalation exposure to 1,1,2-trichloro-1,2,2-trifluoroethane are the CNS and the heart.

Carcinogenicity

There were no reports of carcinogenicity associated with 1,1,2-trichloro-1,2,2-trifluoroethane (ACGIH 1986).

Attachment
B.III

ATTACHMENT B.III

INTAKE AND RISK/HAZARD RESULTS

ATTACHMENT B.III

INTAKE TABLES FOR CARCINOGENIC AND NONCARCINOGENIC RISK

The following attachment has been assembled to supplement the information provided in Section B.2 of this Baseline Risk Assessment. This attachment contains summary tables of the CPC screening procedure, exposure point concentrations, intake and risk calculations.

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TABLE B.3.1-2(a)
Constituents of Potential Concern (CPCs)
Active Flyash Pile: Surface Soil (Source)[a]

Parameter	Units	Distr.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(LN)	CPC-1[c]	CPC-2[d]	EPA RAGs[b] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[e]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	L	14	14	3430	11100	–[f]	–	–	–	7021.971	8247.447	N	N	ND[j]	A, B	N	8.247
Antimony	mg/kg	N	14	7	1.5	3.2	1.4	6.3	1.732	2.145	–	–	N	Y	10.8	G	N	2.145
Arsenic	mg/kg	N	14	14	10.4	145	–	–	70.043	89.816	–	–	Y	–	0.0366		Y	89.82
Barium	mg/kg	N	14	14	75	349	–	–	210.264	253.899	–	–	Y	–	1890	G	N	253.9
Beryllium	mg/kg	N	14	14	1.5	6.4	–	–	3.900	4.672	–	–	Y	–	0.0149		Y	4.672
Calcium	mg/kg	U	14	14	1900	59800	–	–	8365.714	–	–	–	Y	–	ND	D	N	59,800
Chromium	mg/kg	N	14	14	6.9	15.4	–	–	12.186	13.325	–	–	Y	–	135	G	N	13.32
Cobalt	mg/kg	N	14	14	8.9	24.9	–	–	16.457	18.803	–	–	Y	–	1620	G	N	18.80
Copper	mg/kg	N	14	14	19.9	94	–	–	61.393	73.837	–	–	Y	–	999	G	N	73.84
Cyanide	mg/kg	N	9	8	0.19	0.47	0.13	0.13	0.264	0.331	–	–	Y	–	540	G	N	0.3309
Iron	mg/kg	L	14	14	3940	16500	–	–	–	–	9137.693	11745.364	N	N	ND	A, B	N	11,745
Lead	mg/kg	N	14	14	21.6	77.4	–	–	47.107	55.440	–	–	Y	–	ND		Y	55.44
Magnesium	mg/kg	U	14	14	376	16600	–	–	2189.429	–	–	–	Y	–	262000	D	N	16,600
Manganese	mg/kg	U	14	14	15.6	463	–	–	115.021	–	–	–	N	N	3780	A, B	N	463.0
Molybdenum	mg/kg	N	14	14	1.7	12.5	–	–	6.857	8.626	–	–	Y	–	135	G	N	8.626
Nickel	mg/kg	N	14	14	15.3	54.2	–	–	33.993	40.107	–	–	Y	–	540	G	N	40.11
Potassium	mg/kg	L	14	14	671	1760	–	–	–	–	1109.466	1275.300	Y	–	ND	D	N	1,275
Selenium	mg/kg	N	14	11	1.9	10.3	0.93	2.8	4.460	5.944	–	–	Y	–	135	G	N	5.944
Silicon	mg/kg	L	14	14	318	1250	–	–	–	–	601.557	750.801	N	N	ND	A, B	N	750.8
Sodium	mg/kg	L	14	14	92.1	302	–	–	–	–	176.532	211.606	Y	–	ND	D	N	211.6
Thallium	mg/kg	N	14	14	0.24	4.4	–	–	2.059	2.659	–	–	Y	–	1.89		Y	2.659
Toluene	mg/kg	N	11	8	0.004	0.16	0.01	0.012	0.047	0.073	–	–	•[g]	–	5400	G	N	0.0729
Vanadium	mg/kg	N	14	14	23	66.3	–	–	43.479	50.239	–	–	Y	–	189	G	N	50.24
Zinc	mg/kg	L	14	14	39.6	94.5	–	–	–	–	66.071	78.315	Y	–	8100	G	N	78.32
GROSS ALPHA	pCi/g	N	14	14	17.9	53.9	–	–	37.593	42.687	–	–	•	–	ND		N[i]	42.69
GROSS BETA	pCi/g	N	14	14	25.6	47.8	–	–	36.707	39.565	–	–	•	–	ND		N[i]	39.56
CS-137	pCi/g	U	14	4	0.0721	0.919	0.04	0.061	0.151	0.268	0.128	0.128	N	Y	--[h]		Y	0.919
NP-237	pCi/g	U	7	7	0.057	5.48	–	–	0.889	–	–	–	•	–	--		Y	5.480
PU-238	pCi/g	L	14	11	0.0317	1.13	0.015	1.29	–	–	0.212	0.722	•	–	--		Y	0.7215
PU-239/240	pCi/g	L	14	9	0.011	0.74	0.02	0.371	–	–	0.105	0.330	•	–	--		Y	0.3302
RA-226	pCi/g	U	14	14	1.3	4.61	–	–	3.109	–	–	–	Y	–	--		Y	4.610
RA-228	pCi/g	U	14	14	1.01	3.17	–	–	2.501	–	–	–	Y	–	--		Y	3.170
SR-90	pCi/g	U	14	7	0.214	4.47	0.153	0.324	0.920	–	–	–	Y	–	--		Y	4.470
TH-228	pCi/g	U	15	15	0.805	3.81	–	–	2.234	–	–	–	Y	–	--		Y	3.810
TH-230	pCi/g	L	15	15	1.5	6.74	–	–	–	–	2.998	3.658	Y	–	--		Y	3.658
TH-232	pCi/g	L	15	15	0.931	3.74	–	–	–	–	2.231	2.661	Y	–	--		Y	2.661
TH-TOTAL	mg/kg	N	15	15	2.9	34.1	–	–	18.685	22.030	–	–	Y	–	ND		Y	22.03
U-234	pCi/g	L	14	14	2.37	4.43	–	–	–	–	3.332	3.599	Y	–	--		Y	3.599
U-235/236	pCi/g	N	14	12	0.082	0.199	0.083	0.19	0.139	0.160	–	–	Y	–	--		Y	0.1603
U-238	pCi/g	N	14	14	2.88	4.39	–	–	3.414	3.606	–	–	Y	–	--		Y	3.606
U-TOTAL	mg/kg	N	14	14	7.86	14.8	–	–	11.613	12.626	–	–	•	–	81	G	N	12.63

L = Lognormal N = Normal U = Undefined

[a] Source is flyash material from the surface of the Active Flyash Pile.
[b] EPA Risk Assessment Guidance, Part B (EPA 1991d)

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TABLE B.3.1-2(a)
Constituents of Potential Concern (CPCs)
Active Flyash Pile: Surface Soil (Source)[a]

Parameter	Units	Distr.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(LN)	CPC-1[c]	CPC-2[d]	EPA RAGs[b] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[e]	Conc. Term (mg/kg; pCi/g)

[c] Initial screening: CPC is removed if concentration term is below background concentration.

[d] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.

[e] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).

[f] – Not applicable

[g] Insufficient toxicological data to screen

[b] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.

[i] Quantitative risk assessment not possible; qualitative use only.

[j] No data available to calculate EPA RAGs, Part B screening value.

[k] Summary of Screening Criteria:

(A) Concentration term is below background.

(B) Concentration term is below the 95th percentile.

(C) Constituent was identified only once in one medium (i.e., not found in any other media).

(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).

(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).

(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemicals).

(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B.3.1–2(b)
Constituents of Potential Concern (CPCs)
Active Flyash Pile: Subsurface Soil (Source)

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC–1[b]	CPC–2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	L	14	14	1570	17900	–	–	–[e]	–	5803	9456	N	Y	ND[j]	D	N	9456
Antimony	mg/kg	U	6	1	2	2	1.3	3.1	1.317	–	–	–	N	Y	10.8	G	N	2.000
Arsenic	mg/kg	N	14	14	9.1	87.8	–	–	52.29	64.27	–	–	Y	–	0.0366		Y	64.27
Barium	mg/kg	L	14	14	56.6	508	–	–	–	–	238.2	389.1	Y	–	1890	G	N	389.1
Beryllium	mg/kg	N	14	14	0.65	4.6	–	–	2.854	3.375	–	–	Y	–	0.0149		Y	3.375
Cadmium	mg/kg	U	14	1	0.79	0.79	0.47	1.4	0.3532	–	–	–	Y	–	27	G	N	0.790
Calcium	mg/kg	L	14	14	826	6680	–	–	–	–	3701	5982	N	N	ND	A, B	N	5982
Chromium	mg/kg	L	14	14	4.4	25.8	–	–	–	–	13.10	19.70	N	Y	135	G	N	19.70
Cobalt	mg/kg	N	14	13	5	21.8	2.5	2.5	12.64	15.16	–	–	Y	–	1620	G	N	15.16
Copper	mg/kg	N	14	14	24	66.1			47.37	53.48	–	–	Y	–	999	G	N	53.48
Cyanide	mg/kg	N	12	8	0.17	0.69	0.12	0.14	0.2329	0.3270	–	–	Y	–	540	G	N	0.327
Iron	mg/kg	U	14	14	2260	31100	–	–	5799	–	–	–	N	Y	ND	D	N	31100
Lead	mg/kg	N	14	14	19.7	68.2	–	–	38.71	45.35	–	–	Y	–	ND		Y	45.35
Magnesium	mg/kg	U	14	14	150	4380	–	–	843.8	–	–	–	N	N	262000	A, B	N	4380
Manganese	mg/kg	U	14	14	8.2	340	–	–	53.49	–	–	–	N	N	3780	A, B	N	340.0
Mercury	mg/kg	U	14	2	0.16	0.19	0.11	0.14	0.0789	–	–	–	Y	–	8.1	G	N	0.190
Molybdenum	mg/kg	N	14	11	4.3	18.8	2.5	4.7	8.089	10.674	–	–	Y	–	135	G	N	10.67
Nickel	mg/kg	N	14	14	6.2	45.7	–	–	24.44	29.24	–	–	Y	–	540	G	N	29.24
Potassium	mg/kg	N	14	14	326	1230	–	–	838.7	966.2	–	–	N	N	ND	A, B	N	966.2
Selenium	mg/kg	L	14	12	0.85	11.4	0.47	2.2	–	–	4.005	8.667	Y	–	135	G	N	8.667
Silicon	mg/kg	L	6	6	302	964	–	–	–	–	665.5	1874.4	Y	–	ND	E	N	1874
Sodium	mg/kg	L	14	14	92.7	312	–	–	–	–	193.3	274.3	Y	–	ND	D	N	274.3
Thallium	mg/kg	N	14	12	0.75	3.1	0.47	0.5	1.657	2.084	–	–	Y	–	1.89		Y	2.084
Vanadium	mg/kg	N	14	14	15	42.6	–	–	33.95	37.39	–	–	Y	–	189	G	N	37.39
Zinc	mg/kg	N	14	14	18.9	120	–	–	64.14	79.32	–	–	N	Y	8100	G	N	79.32
GROSS ALPHA	pci/g	L	8	8	35.7	62	–	–	–	–	49.80	76.01	•[f]	–	ND		N[h]	76.01
GROSS BETA	pci/g	L	8	8	30.1	47.2	–	–	–	–	41.92	59.29	•	–	ND		N[h]	59.29
NP–237	pci/g	U	11	5	0.059	0.45	0.6	0.6	0.258	–	–	–	•	–	--[g]		Y	0.450
PB–210	pci/g	U	2	2	1.52	1.63	–	–	1.575	–	–	–	Y	–	--		Y	1.630
PU–238	pci/g	U	16	4	0.062	0.123	0.32	0.6	0.234	–	–	–	•	–	--		Y	0.123
PU–239/240	pci/g	U	10	3	0.017	0.11	0.028	0.86	0.185	–	–	–	•	–	--		Y	0.110
RA–224	pci/g	U	2	2	3.44	3.74	–	–	3.590	–	–	–	Y	–	--		Y	3.740
RA–226	pci/g	L	16	16	2.53	6.22	–	–	–	–	4.13	5.24	Y	–	--		Y	5.240
RA–228	pci/g	L	16	16	2.23	5.32	–	–	–	–	3.39	4.34	Y	–	--		Y	4.336
SR–90	pci/g	N	16	9	0.65	1.53	0.171	0.9	0.733	0.964	–	–	Y	–	--		Y	0.964
TH–228	pci/g	U	16	16	1.8	5.79	–	–	3.284	–	–	–	Y	–	--		Y	5.790
TH–230	pci/g	L	16	16	2.4	6.08	–	–	–	–	4.36	5.72	Y	–	--		Y	5.717
TH–232	pci/g	L	16	16	1.89	5.08	–	–	–	–	2.98	3.87	Y	–	--		Y	3.866
TH–TOTAL	mg/kg	L	16	16	17	45.8	–	–	–	–	27.09	35.07	Y	–	ND		Y	35.07
U–234	pci/g	L	16	16	3.04	17.3	–	–	–	–	5.88	8.90	Y	–	--		Y	8.903
U–235	pci/g	U	2	1	0.6	0.6	0.4	0.4	0.400	–	–	–	•	–	--		Y	0.600
U–235/236	pci/g	U	16	6	0.125	4.12	0.12	0.6	0.683	–	–	–	Y	–	--		Y	4.120
U–238	pci/g	N	18	18	3.15	12.6	–	–	5.848	6.911	–	–	Y	–	--		Y	6.911
U–TOTAL	mg/kg	L	16	16	9.08	31.3	–	–	–	–	21.05	29.96	•	–	81	G	N	29.96
Total Organic Carbon	mg/kg	U	4	4	63907	420620	–	–	168520	–	–	–	–	–	ND	F	N	420620
2–Chlorophenol	mg/kg	U	16	1	0.048	0.048	0.4	0.5	0.20643	–	–	–	–	–	135	C	N	0.048
2–Methylnaphthalene	mg/kg	U	16	3	0.049	0.16	0.4	0.5	0.19612	–	–	–	–	–	ND		Y	0.16
4–Chloro–3–methylphenol	mg/kg	U	16	1	0.058	0.058	0.4	0.5	0.20706	–	–	–	–	–	ND	C	N	0.058
4–Nitrophenol	mg/kg	U	16	1	0.048	0.048	0.97	2.4	0.79518	–	–	–	–	–	ND	C	N	0.048

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TABLE B.3.1-2(b)
Constituents of Potential Concern (CPCs)
Active Flyash Pile: Subsurface Soil (Source)

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Benzoic acid	mg/kg	U	16	7	0.002	0.1	1.9	2.4	0.62512	–	–	–	–	–	108000	G	N	0.1
Di-n-butyl phthalate	mg/kg	U	16	4	0.047	0.086	0.4	0.5	0.1785	–	–	–	–	–	2700	G	N	0.086
Di-n-octyl phthalate	mg/kg	U	16	1	3	3	0.4	0.5	0.39093	–	–	–	–	–	540	C	N	3
Naphthalene	mg/kg	U	16	2	0.052	0.082	0.4	0.5	0.19868	–	–	–	–	–	1080	G	N	0.082
Pentachlorophenol	mg/kg	U	16	1	0.056	0.056	1	2.4	0.82787	–	–	–	–	–	0.533	G	N	0.056
Phenanthrene	mg/kg	U	16	3	0.043	0.072	0.4	0.5	0.18768	–	–	–	–	–	ND		Y	0.072
Phenol	mg/kg	U	16	1	0.058	0.058	0.4	0.5	0.20706	–	–	–	–	–	16200	G	N	0.058
bis(2-Ethylhexyl) phthalate	mg/kg	U	16	6	0.048	2.7	0.4	0.45	0.4105	–	–	–	–	–	4.57	G	N	2.7
1,1,1-Trichloroethane	mg/kg	L	15	12	0.012	1.3	0.006	0.014	–	–	0.135488	0.45511	–	–	2430	G	N	0.455
1,1-Dichloroethane	mg/kg	U	10	1	0.007	0.007	0.006	0.068	0.01355	–	–	–	–	–	2700	C	N	0.007
1,1-Dichloroethene	mg/kg	U	10	1	0.007	0.007	0.006	0.068	0.01355	–	–	–	–	–	0.105	C	N	0.007
1,2-Dichloroethane	mg/kg	U	9	1	0.007	0.007	0.006	0.068	0.01127	–	–	–	–	–	0.703	C	N	0.007
2-Butanone	mg/kg	U	7	2	0.004	0.015	0.013	0.068	0.01485	–	–	–	–	–	16200	G	N	0.015
2-Hexanone	mg/kg	U	5	1	0.01	0.01	0.012	0.062	0.0121	–	–	–	–	–	1080	C	N	0.01
4-Methyl-2-pentanone	mg/kg	U	6	2	0.011	0.025	0.012	0.062	0.01441	–	–	–	–	–	1350	G	N	0.025
Acetone	mg/kg	U	9	2	0.015	0.037	0.013	0.29	0.02688	–	–	–	–	–	2700	G	N	0.037
Benzene	mg/kg	U	5	1	0.002	0.002	0.006	0.062	0.0099	–	–	–	–	–	2.21	C	N	0.002
Bromomethane	mg/kg	U	10	1	0.015	0.015	0.012	0.068	0.0153	–	–	–	–	–	37.8	C	N	0.015
Carbon disulfide	mg/kg	U	11	2	0.007	0.007	0.006	0.068	0.01295	–	–	–	–	–	2700	G	N	0.007
Chloroethane	mg/kg	U	10	1	0.015	0.015	0.012	0.068	0.0153	–	–	–	–	–	ND	C	N	0.015
Chloroform	mg/kg	U	9	1	0.007	0.007	0.006	0.068	0.01127	–	–	–	–	–	10.5	C	N	0.007
Chloromethane	mg/kg	U	10	1	0.015	0.015	0.012	0.068	0.0153	–	–	–	–	–	4.92	G	N	0.015
Methylene chloride	mg/kg	U	12	5	0.034	0.2	0.006	0.062	0.04170	–	–	–	–	–	8.53	G	N	0.2
Toluene	mg/kg	L	12	11	0.012	0.44	0.006	0.006	–	–	0.082233	0.27840	–	–	5400	G	N	0.278
Vinyl chloride	mg/kg	U	10	1	0.015	0.015	0.012	0.068	0.0153	–	–	–	–	–	0.0337	C	N	0.015
Xylenes, Total	mg/kg	U	4	1	0.053	0.053	0.006	0.014	0.01737	–	–	–	–	–	54000	C	N	0.053

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[k] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

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TABLE B.3.1-2(c)
Constituents of Potential Concern
Active Flyash Pile/Inactive Flyash Pile/South Field: Perched Water – 1000 Series Wells

Parameter	Units	Dist.	Samp.	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL (N)	Est.Mean	UCL (L)	CPC 1[b]	CPC 2[c]	EPA RAGs[a] Residential Tap Water (mg/L; pCi/L)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/l	U	9	8	0.0695	86.1	0.03945	0.03945	21.336	–[e]	–	–	*[f]	*	ND[g]	D	N	86.100
Antimony	mg/l	U	9	2	0.0057	0.0132	0.00165	0.00315	0.004	–	–	–	*	*	0.00146		Y	0.013
Arsenic	mg/l	U	9	4	0.0034	0.0104	0.0005	0.001	0.003	–	–	–	*	*	0.000000146		Y	0.010
Barium	mg/l	U	9	9	0.0486	0.565	–	–	0.188	–	–	–	*	*	0.256		Y	0.565
Beryllium	mg/l	U	9	1	0.0037	0.0037	0.0005	0.0012	0.001	–	–	–	*	*	0.000000237		Y	0.004
Cadmium	mg/l	U	9	1	0.034	0.034	0.001	0.0025	0.005	–	–	–	*	*	0.00000036		Y	0.034
Calcium	mg/l	L	9	9	56	610	–	–	–	–	231.911	507.121	*	*	ND	D	N	507.121
Chromium	mg/l	L	9	5	0.0046	0.0898	0.002	0.007	–	–	0.028	0.272	*	*	0.000000054		Y	0.090
Cobalt	mg/l	U	9	3	0.0246	0.0334	0.0015	0.005	0.011	–	–	–	*	*	0.219	G	N	0.033
Copper	mg/l	U	9	4	0.0173	0.12	0.001	0.01035	0.033	–	–	–	*	*	0.135	G	N	0.120
Iron	mg/l	U	9	6	0.958	131	0.0097	0.0123	32.443	–	–	–	*	*	ND	D	N	131.000
Lead	mg/l	U	9	6	0.0016	0.0449	0.0005	0.001	0.014	–	–	–	*	*	ND		Y	0.045
Magnesium	mg/l	L	9	9	18	250	–	–	–	–	93.158	219.038	*	*	35.4	D	N	219.038
Manganese	mg/l	U	9	9	0.0115	2.37	–	–	0.909	–	–	–	*	*	0.511	G	N	2.370
Molybdenum	mg/l	U	9	3	0.0309	0.0435	0.0016	0.01	0.015	–	–	–	*	*	0.0182		Y	0.044
Nickel	mg/l	U	9	7	0.0072	0.136	0.0015	0.01	0.054	–	–	–	*	*	0.0000027		Y	0.136
Potassium	mg/l	L	9	8	0.718	16	0.447	0.447	–	–	7.175	53.169	*	*	ND	D	N	16.000
Selenium	mg/l	U	9	3	0.0036	0.0195	0.0005	0.001	0.003	–	–	–	*	*	0.0182		Y	0.020
Silicon	mg/l	U	9	9	6.58	102	–	–	33.907	–	–	–	*	*	ND		Y	102.000
Silver	mg/l	U	9	3	0.018	0.0351	0.001	0.005	0.009	–	–	–	*	*	0.0182		Y	0.035
Sodium	mg/l	L	9	9	8.81	15.6	–	–	–	–	10.983	12.453	*	*	ND	D	N	12.453
Vanadium	mg/l	U	9	4	0.0169	0.205	0.0037	0.00705	0.052	–	–	–	*	*	0.0255		Y	0.205
Zinc	mg/l	U	9	6	0.0084	0.33	0.003	0.0076	0.100	–	–	–	*	*	1.09	G	N	0.330
Cyanide	mg/l	U	10	2	0.0016	0.0024	0.0005	0.001	0.001	–	–	–	*	*	0.073	G	N	0.002
GROSS ALPHA	pci/l	U	10	5	38	1080	2.01	10	228.842	–	–	–	*	*	ND		N[i]	1080.000
GROSS BETA	pci/l	U	10	8	4.35	638	2.545	5.5	121.821	–	–	–	*	*	ND		N[i]	638.000
NP-237	pci/l	U	19	6	0.22	1.2	0.065	0.5	0.421	–	–	–	N	Y	--[h]		Y	1.200
PU-238	pci/l	U	22	4	0.09	0.56	0.03245	0.5	0.312	–	–	–	N	Y	--		Y	0.170
PU-239/240	pci/l	U	22	2	0.193	0.2	0.01965	0.5	0.292	–	–	–	N	Y	--		Y	0.193
RA-226	pci/l	U	18	2	1.05	1.46	0.045	0.5	0.431	–	–	–	N	Y	--		Y	1.460
RA-228	pci/l	U	19	1	5.93	5.93	0.4395	1.7	1.394	–	–	–	N	Y	--		Y	5.930
SR-90	pci/l	U	22	3	1.19	3.31	0.299	2.5	1.750	–	–	–	N	Y	--		Y	3.050
TH-228	pci/l	U	22	6	0.13	3.87	0.0125	0.5	0.667	–	–	–	N	Y	--		Y	2.210
TH-230	pci/l	U	22	11	0.11	6.8	0.069	0.5	0.920	–	–	–	N	Y	--		Y	3.900
TH-232	pci/l	U	22	5	0.032	3.75	0.01	0.5	0.592	–	–	–	N	Y	--		Y	1.770
TH-TOTAL	mg/l	U	19	7	0.00029	0.0342	0.00009	0.002	0.00488	–	–	–	N	Y	ND		Y	0.0342
U-234	pci/l	U	22	20	0.54	223	0.5	0.5	40.253	–	–	–	Y	Y	--		Y	216.000
U-235/236	pci/l	U	22	8	0.479	15.7	0.0255	0.5	2.367	–	–	–	N	Y	--		Y	10.700
U-238	pci/l	U	22	20	0.47	229	0.5	0.5	40.788	–	–	–	Y	Y	--		Y	220.000
U-TOTAL	mg/l	U	21	21	0.001	0.573	–	–	0.10564	–	–	–	Y	Y	0.0109		Y	0.547
Di-n-butyl phthalate	mg/l	U	9	1	0.004	0.004	0.005	0.005	0.00488	–	–	–	*	*	0.365	G	N	0.004

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TABLE B.3.1-2(c)
Constituents of Potential Concern
Active Flyash Pile/Inactive Flyash Pile/South Field: Perched Water – 1000 Series Wells

Parameter	Units	Dist.	Samp.	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL (N)	Est.Mean	UCL (L)	CPC 1[b]	CPC 2[c]	EPA RAGs[a] Residential Tap Water (mg/L; pCi/L)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
2-Butanone	mg/l	U	9	1	0.001	0.001	0.005	0.005	0.00455	–	–	–	*	*	0.247	G	N	0.001
Ammonia	mg/l	U	20	4	0.00012	0.00056	0.00001	0.00005	0.00010	–	–	–	*	N	0.0278	B	N	0.00041
Chloride	mg/l	L	20	16	0.0025	0.0456	0.00025	0.00175	–	–	0.009473	0.02215	*	N	ND	B	N	0.02215
Fluoride	mg/l	L	20	20	0.00019	0.00142	–	–	–	–	0.000461	0.00058	*	Y	0.219	F	N	0.00058
Nitrate	mg/l	N	10	8	0.00006	0.00041	0.00005	0.00005	0.00019	0.000280	–	–	*	N	5.84	B	N	0.00028
Phenols	mg/l	U	20	3	0.00002	0.00002	0.00000	0.00000	0.00000	–	–	–	N	*	ND	F	N	0.00002
Phosphorus	mg/l	N	15	12	0.00008	0.00088	0.00002	0.00005	0.00031	0.000433	–	–	*	Y	ND	F	N	0.00043
Sulfate	mg/l	N	20	19	0.01	0.2037	0.0307	0.0307	0.09187	0.112451	–	–	*	Y	ND	F	N	0.11245

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if c term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] Insufficient toxicological data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[j] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B3.1-2d
ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.919		2.8E-11	1.9E-11	2.0E-06				
NP-237	5.48		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.722		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.33		2.3E-10	3.8E-08	2.7E-11				
RA-226	4.61		7.8E-10	7.0E-09	6.0E-06				
RA-228	3.17		1.0E-10	6.9E-10	2.9E-06				
SR-90	4.47		3.6E-11	6.2E-11	0.0E+00				
TH-228	3.81		5.5E-11	7.8E-08	5.6E-06				
TH-230	3.551		1.3E-11	2.9E-08	5.4E-11				
TH-232	2.674		1.7E-10	1.1E-07	8.5E-06				
U-234	3.599		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.16		1.6E-11	2.5E-08	2.4E-07				
U-238	3.606		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	89.816	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	4.672	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	55.44	1.00E-02							
Thallium	2.659	1.00E-02					7.00E-05		7.00E-05
TH-TOTAL	24.493								
2-Methylnaphthalene	0.056	3.00E-01							
Benzo(a)anthracene	0.11		7.30E-01	6.10E-01					
Benzo(a)pyrene	0.12		7.30E+00	6.10E+00					
Benzo(b)fluoranthen	0.18		7.30E-01	6.10E-01					
Phenanthrene	0.21	3.00E-01							

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TABLE B3.1-2d
ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

SEDIMENT									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	5.29		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.72		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.33		2.3E-10	3.8E-08	2.7E-11				
RA-226	4.6		7.8E-10	7.0E-09	6.0E-06				
RA-228	3.18		1.0E-10	6.9E-10	2.9E-06				
SR-90	4.47		3.6E-11	6.2E-11	0.0E+00				
U-234	3.22		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.143		1.6E-11	2.5E-08	2.4E-07				
U-238	3.22		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)		SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	8.97E+01	1.00E-03	1.75E+00			1.84E+00	3.00E-04		2.85E-04
Beryllium	4.67E+00	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	5.48E+01	1.00E-02							

TABLE B3.1-2d
ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT			*FUTURE*		
	On-Subunit	On-Property	Off-Prop	On-Subunit	On-Property	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m
CS-137	9.47E-06	6.91E-06	6.87E-07	9.47E-06	6.91E-06	6.87E-07
NP-237	5.67E-05	4.13E-05	4.11E-06	5.67E-05	4.13E-05	4.11E-06
PU-238	7.21E-06	5.25E-06	5.24E-07	7.21E-06	5.25E-06	5.24E-07
PU-239/240	3.30E-06	2.48E-06	2.47E-07	3.30E-06	2.48E-06	2.47E-07
RA-226	4.74E-05	3.45E-05	3.44E-06	4.74E-05	3.45E-05	3.44E-06
RA-228	3.30E-05	2.40E-05	2.39E-06	3.30E-05	2.40E-05	2.39E-06
SR-90	4.64E-05	3.38E-05	3.37E-06	4.64E-05	3.38E-05	3.37E-06
TH-228	3.91E-05	2.85E-05	2.84E-06	3.91E-05	2.85E-05	2.84E-06
TH-230	3.66E-05	2.67E-05	2.66E-06	3.66E-05	2.67E-05	2.66E-06
TH-232	2.78E-05	2.03E-05	2.02E-06	2.78E-05	2.03E-05	2.02E-06
U-234	3.71E-05	2.70E-05	2.69E-06	3.71E-05	2.70E-05	2.69E-06
U-235/236	1.65E-06	1.20E-06	1.20E-07	1.65E-06	1.20E-06	1.20E-07
U-238	3.71E-05	2.70E-05	2.69E-06	3.71E-05	2.70E-05	2.69E-06
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3
Arsenic	9.25E-07	6.74E-07	6.72E-08	9.25E-07	6.74E-07	6.72E-08
Beryllium	4.84E-08	3.53E-08	3.52E-09	4.84E-08	3.53E-08	3.52E-09
Lead	5.71E-07	4.16E-07	4.14E-08	5.71E-07	4.16E-07	4.14E-08
Thallium	2.78E-08	2.03E-08	2.02E-09	2.78E-08	2.03E-08	2.02E-09
TH-TOTAL	2.53E-07	1.84E-07	1.83E-08	2.53E-07	1.84E-07	1.83E-08
2-Methylnaphthalene	5.77E-10	4.21E-10	4.19E-11	5.77E-10	4.21E-10	4.19E-11
Benzo(a)anthracene	1.13E-09	8.27E-10	8.23E-11	1.13E-09	8.27E-10	8.23E-11
Benzo(a)pyrene	1.24E-09	9.02E-10	8.98E-11	1.24E-09	9.02E-10	8.98E-11
Benzo(b)fluoranthene	1.85E-09	1.35E-09	1.35E-10	1.85E-09	1.35E-09	1.35E-10
Phenanthrene	2.16E-09	1.58E-09	1.57E-10	2.16E-09	1.58E-09	1.57E-10

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TABLE B3.1-2d
ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER										
	on-site	FEMP								
	100 yrs	Bdry (120 yrs)								
Contamina	onc'n (pCi/l	Conc'n (pCi/l)		SF(o)	SF(i)	SF(e)				
NP-237	3.14E-04	2.52E-02		2.2E-10	2.9E-08	4.3E-07				
SR-90	5.47E-01	5.19E-02		3.6E-11	6.2E-11	0.0E+00				
U-234	1.98E+01	2.58E+00		1.6E-11	2.6E-08	3.0E-11				
U-235/236	1.05	1.38E-01		1.6E-11	2.5E-08	2.4E-07				
U-238	2.18E+01	2.85E+00		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/l)	(mg/l)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	1.84E-13	7.46E-08	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	1.82E-15	1.40E-09	1.00E-03	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	2.06E-09	5.82E-06	4.00E-06							
U-Total	7.76E-02	1.02E-02	1.00E-03					3.00E-03		1.50E-04
2-Methyln	1.95E-03		1.42E-01							

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TABLE B3.1-2d
ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

GMR Surface Water									
Contaminan	onc'n (pCi/l	BCF	SF(o)	SF(i)	SF(e)				
CHEM	(mg/l)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	fD(i	RfD(derm)
Arsenic	1.60E-07	1.00E-03	1.75E+00			1.84E+00	3.00E-04		2.85E-04
Lead	5.15E-07	4.00E-06							
		BCF							
Arsenic		44							
Lead		48.999							

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TABLE B3.1-2d
ACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

Surface Water (non-gmr)									
Contaminan	Conc'n (pCi/l)		SF(o)	SF(i)	SF(e)				
NP-237	2.51E+01		2.2E-10		4.3E-07				
PU-238	1.70E-01		2.2E-10		2.8E-11				
PU-239/240	7.79E-02		2.3E-10		2.7E-11				
RA-226	1.02E+00		7.8E-10		6.0E-06				
RA-228	7.08E-01		1.0E-10		2.9E-06				
SR-90	9.94E-01		3.6E-11		0.0E+00				
U-234	5.14E+01		1.6E-11		3.0E-11				
U-235/236	2.29E+00		1.6E-11		2.4E-07				
U-238	5.13E+01		2.8E-11		3.6E-08				
CHEM	(mg/l)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	1.06E-02	1.00E-03	1.75			1.84E+00	3.00E-04		2.85E-04
Beryllium	4.41E-04	1.00E-03	4.3				5.00E-03		5.00E-05
Lead	3.40E-02	4.00E-06							

TABLE B.3.1-4
CURRENT, TRESPASSING YOUTH
ACTIVE FLYASH PILE: SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	9.47E-06	2.0E-02	1.9E-11	3.7E-13
NP-237	5.67E-05	1.2E-01	2.9E-08	3.4E-09
PU-238	7.21E-06	1.5E-02	3.9E-08	5.8E-10
PU-239/240	3.30E-06	6.8E-03	3.8E-08	2.6E-10
RA-226	4.74E-05	9.8E-02	7.0E-09	6.9E-10
RA-228	3.30E-05	6.8E-02	6.9E-10	4.7E-11
SR-90	4.64E-05	9.6E-02	6.2E-11	6.0E-12
TH-228	3.91E-05	8.1E-02	7.8E-08	6.3E-09
TH-230	3.66E-05	7.6E-02	2.9E-08	2.2E-09
TH-232	2.78E-05	5.8E-02	1.1E-07	6.3E-09
U-234	3.71E-05	7.7E-02	2.6E-08	2.0E-09
U-235/236	1.65E-06	3.4E-03	2.5E-08	8.5E-11
U-238	3.71E-05	7.7E-02	5.2E-08	4.0E-09
			Total Pathway:	2.6E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	9.19E-01	1.1E+01	2.8E-11	3.1E-10
NP-237	5.48E+00	6.5E+01	2.2E-10	1.4E-08
PU-238	7.22E-01	8.6E+00	2.2E-10	1.9E-09
PU-239/240	3.30E-01	3.9E+00	2.3E-10	9.0E-10
RA-226	4.61E+00	5.5E+01	7.8E-10	4.3E-08
RA-228	3.17E+00	3.8E+01	1.0E-10	3.8E-09
SR-90	4.47E+00	5.3E+01	3.6E-11	1.9E-09
TH-228	3.81E+00	4.5E+01	5.5E-11	2.5E-09
TH-230	3.55E+00	4.2E+01	1.3E-11	5.5E-10
TH-232	2.67E+00	3.2E+01	1.7E-10	5.4E-09
U-234	3.60E+00	4.3E+01	1.6E-11	6.8E-10
U-235/236	1.60E-01	1.9E+00	1.6E-11	3.0E-11
U-238	3.61E+00	4.3E+01	2.8E-11	1.2E-09
			Total Pathway:	7.6E-08

Chemical Risk

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Arsenic	9.25E-07	1.7E-09	1.5E+01	2.6E-08
Beryllium	4.84E-08	9.1E-11	8.40E+00	7.7E-10
Lead	5.71E-07	1.1E-09		
Thallium	2.78E-08	5.2E-11		
TH-TOTAL	2.53E-07	4.8E-10		
2-Methylnaphthalen	5.77E-10	1.1E-12		
Benzo(a)anthracene	1.13E-09	2.1E-12	6.10E-01	1.3E-12
Benzo(a)pyrene	1.24E-09	2.3E-12	6.10E+00	1.4E-11
Benzo(b)fluoranthen	1.85E-09	3.5E-12	6.10E-01	2.1E-12
Phenanthrene	2.16E-09	4.1E-12		
			Total Pathway:	2.7E-08
			Total Rad + Chem	5.3E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	8.98E+01	9.7E-07	1.8E+00	1.7E-06
Beryllium	4.67E+00	5.0E-08	4.3E+00	2.2E-07
Lead	5.54E+01	6.0E-07		
Thallium	2.66E+00	2.9E-08		
TH-TOTAL	2.45E+01	2.6E-07		
2-Methylnaphthalene	5.60E-02	6.0E-10		
Benzo(a)anthracene	1.10E-01	1.2E-09	7.30E-01	8.7E-10
Benzo(a)pyrene	1.20E-01	1.3E-09	7.30E+00	9.5E-09
Benzo(b)fluoranthene	1.80E-01	1.9E-09	7.30E-01	1.4E-09
Phenanthrene	2.10E-01	2.3E-09		
			Total Pathway:	1.9E-06
			Total Rad + Chem	2.0E-06

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TABLE B.3.1-4
(continued)

CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable (1)	CS-137	2.0E-01	2.0E-06	3.9E-07	3.9E-07
	NP-237	1.2E+00	4.3E-07	5.0E-07	5.2E-07
	PU-238	1.5E-01	2.8E-11	4.3E-12	2.5E-09
	PU-239/240	7.1E-02	2.7E-11	1.9E-12	1.2E-09
	RA-226	9.9E-01	6.0E-06	5.9E-06	6.0E-06
	RA-228	6.8E-01	2.9E-06	2.0E-06	2.0E-06
	SR-90	9.6E-01			1.9E-09
	TH-228	8.1E-01	5.6E-06	4.6E-06	4.6E-06
	TH-230	7.6E-01	5.4E-11	4.1E-11	2.8E-09
	TH-232	5.7E-01	8.5E-06	4.9E-06	4.9E-06
	U-234	7.7E-01	3.0E-11	2.3E-11	2.7E-09
	U-235/236	3.4E-02	2.4E-07	8.2E-09	8.3E-09
	U-238	7.7E-01	3.6E-08	2.8E-08	3.3E-08
Total Pathway:			Total Pathway:	1.8E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Arsenic	2.1E-07	1.8E+00	3.9E-07					2.1E-06
Beryllium			2.2E-07					4.3E-07
Lead	1.3E-06							
Thallium	6.3E-08							
TH-TOTAL				Not applicable				
2-Methylnaphthalene	4.0E-08							
Benzo(a)anthracene			8.7E-10					1.7E-09
Benzo(a)pyrene			9.5E-09					1.9E-08
Benzo(b)fluoranthene			1.4E-09					2.8E-09
Phenanthrene	1.5E-07							
		Total Pathway:	6.2E-07			Total Pathway:		

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 6.2E-07 1.8E-05 *Total:* 2.1E-05

TABLE B.3.1-4
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3	Intake	RfD(i)	HQ
CS-137	9.47E-06	2.0E-02		
NP-237	5.67E-05	1.2E-01		
PU-238	7.21E-06	1.5E-02		
PU-239/240	3.30E-06	6.8E-03		
RA-226	4.74E-05	9.8E-02		
RA-228	3.30E-05	6.8E-02		
SR-90	4.64E-05	9.6E-02		
TH-228	3.91E-05	8.1E-02		
TH-230	3.66E-05	7.6E-02		
TH-232	2.78E-05	5.8E-02		
U-234	3.71E-05	7.7E-02		
U-235/236	1.65E-06	3.4E-03		
U-238	3.71E-05	7.7E-02		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	HQ
CS-137	9.19E-01	1.1E+01		
NP-237	5.48E+00	6.5E+01		
PU-238	7.22E-01	8.6E+00		
PU-239/240	3.30E-01	3.9E+00		
RA-226	4.61E+00	5.5E+01		
RA-228	3.17E+00	3.8E+01		
SR-90	4.47E+00	5.3E+01		
TH-228	3.81E+00	4.5E+01		
TH-230	3.55E+00	4.2E+01		
TH-232	2.67E+00	3.2E+01		
U-234	3.60E+00	4.3E+01		
U-235/236	1.60E-01	1.9E+00		
U-238	3.61E+00	4.3E+01		

Total Pathway:

Chemical Hazard

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	HQ
Arsenic	9.25E-07	1.0E-08		
Beryllium	4.84E-08	5.3E-10		
Lead	5.71E-07	6.3E-09		
Thallium	2.78E-08	3.1E-10		
TH-TOTAL	2.53E-07	2.8E-09		
2-Methylnaphthalene	5.77E-10	6.3E-12		
Benzo(a)anthracene	1.13E-09	1.2E-11		
Benzo(a)pyrene	1.24E-09	1.4E-11		
Benzo(b)fluoranthene	1.85E-09	2.0E-11		
Phenanthrene	2.16E-09	2.4E-11		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	HQ
Arsenic	8.98E+01	5.7E-06	3.0E-04	1.9E-02
Beryllium	4.67E+00	2.9E-07	5.0E-03	5.9E-05
Lead	5.54E+01	3.5E-06		
Thallium	2.66E+00	1.7E-07	7.0E-05	2.4E-03
TH-TOTAL	2.45E+01	1.5E-06		
2-Methylnaphthalene	5.60E-02	3.5E-09		
Benzo(a)anthracene	1.10E-01	6.9E-09		
Benzo(a)pyrene	1.20E-01	7.6E-09		
Benzo(b)fluoranthene	1.80E-01	1.1E-08		
Phenanthrene	2.10E-01	1.3E-08		

Total Pathway: 2.1E-02

Total Rad + Chem 2.1E-02

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TABLE B.3.1-4
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	HQ
Not applicable	CS-137	2.0E-01		
	NP-237	1.2E+00		
	PU-238	1.5E-01		
	PU-239/240	7.1E-02		
	RA-226	9.9E-01		
	RA-228	6.8E-01		
	SR-90	9.6E-01		
	TH-228	8.1E-01		
	TH-230	7.6E-01		
	TH-232	5.7E-01		
	U-234	7.7E-01		
	U-235/236	3.4E-02		
	U-238	7.7E-01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	HQ	Compound	Intake	RfD(o)	HQ	
Arsenic	1.2E-06	2.9E-04	4.4E-03					2.3E-02
Beryllium	6.5E-07	5.0E-05	5.9E-05					1.2E-04
Lead	7.7E-06							
Thallium	3.7E-07	7.0E-05	5.3E-03					7.7E-03
TH-TOTAL				Not applicable				
2-Methylnaphthalene	2.3E-07							
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Phenanthrene	8.8E-07							
	Total Pathway:		9.7E-03		Total Pathway:			
	Total Rad + Chem		9.7E-03		Total Rad + Chem			***Total:*** 3.1E-02

TABLE B.3.1-5(a)
CURRENT, TRESPASSING YOUTH
ACTIVE FLYASH PILE: SURFACE WATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	2.51E+01	5.5E+02	2.2E-10	1.2E-07		1.2E-07
PU-238	1.70E-01	3.7E+00	2.2E-10	8.2E-10	Not applicable	8.2E-10
PU-239/240	7.79E-02	1.7E+00	2.3E-10	3.9E-10		3.9E-10
RA-226	1.02E+00	2.2E+01	7.8E-10	1.7E-08		1.7E-08
RA-228	7.08E-01	1.5E+01	1.0E-10	1.5E-09		1.5E-09
SR-90	9.94E-01	2.2E+01	3.6E-11	7.8E-10		7.8E-10
U-234	5.14E+01	1.1E+03	1.6E-11	1.8E-08		1.8E-08
U-235/236	2.29E+00	5.0E+01	1.6E-11	8.0E-10		8.0E-10
U-238	5.13E+01	1.1E+03	2.8E-11	3.1E-08		3.1E-08
			Total Pathway:	1.9E-07	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	1.06E-02	2.1E-07	1.8E+00	3.7E-07	Arsenic	3.1E-08	1.8E+00	5.7E-08	4.3E-07
Beryllium	4.41E-04	8.8E-09	4.3E+00	3.8E-08	Beryllium			3.8E-08	7.5E-08
Lead	3.40E-02	6.8E-07			Lead	4.0E-10			
			Total Pathway:	4.1E-07			Total Pathway:	9.5E-08	

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 6.0E-07 | Total Rad + Chem 9.5E-08 | *Total:* 6.9E-07

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TABLE B.3.1-5(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	2.51E+01	5.5E+02			Not applicable	
PU-238	1.70E-01	3.7E+00				
PU-239/240	7.79E-02	1.7E+00				
RA-226	1.02E+00	2.2E+01				
RA-228	7.08E-01	1.5E+01				
SR-90	9.94E-01	2.2E+01				
U-234	5.14E+01	1.1E+03				
U-235/236	2.29E+00	5.0E+01				
U-238	5.13E+01	1.1E+03				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	1.06E-02	1.2E-06	3.0E-04	4.1E-03	Arsenic	1.8E-07	2.9E-04	6.3E-04	4.7E-03
Beryllium	4.41E-04	5.1E-08	5.0E-03	1.0E-05	Beryllium	7.5E-09	5.0E-05	1.5E-04	1.6E-04
Lead	3.40E-02	3.9E-06			Lead	2.3E-09			
			Total Pathway:	4.1E-03			Total Pathway:	7.8E-04	
			Total Rad + Chem	4.1E-03			Total Rad + Chem	7.8E-04	*Total:* 4.9E-03

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FEMP-OU02-6 FINAL
January 21, 1995

TABLE B.3.1-5(b)
CURRENT, TRESPASSING YOUTH
ACTIVE FLYASH PILE: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment					Dermal Contact/Sediment	External RadiationSediment				
Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk		Compound	Intake	SF(e)	Risk	
NP-237	5.29E+00	2.0E+01	2.2E-10	4.4E-09		NP-237	3.8E-01	4.3E-07	1.6E-07	1.7E-07
PU-238	7.20E-01	2.7E+00	2.2E-10	5.9E-10	Not applicable	PU-238	5.1E-02	2.8E-11	1.4E-12	5.9E-10
PU-239/240	3.30E-01	1.2E+00	2.3E-10	2.8E-10		PU-239/240	2.4E-02	2.7E-11	6.3E-13	2.8E-10
RA-226	4.60E+00	1.7E+01	7.8E-10	1.3E-08		RA-226	3.3E-01	6.0E-06	2.0E-06	2.0E-06
RA-228	3.18E+00	1.2E+01	1.0E-10	1.2E-09		RA-228	2.3E-01	2.9E-06	6.6E-07	6.6E-07
SR-90	4.47E+00	1.7E+01	3.6E-11	6.0E-10		SR-90	3.2E-01			6.0E-10
U-234	3.22E+00	1.2E+01	1.6E-11	1.9E-10		U-234	2.3E-01	3.0E-11	6.9E-12	2.0E-10
U-235/236	1.43E-01	5.4E-01	1.6E-11	8.6E-12		U-235/236	1.0E-02	2.4E-07	2.4E-09	2.5E-09
U-238	3.22E+00	1.2E+01	2.8E-11	3.4E-10		U-238	2.3E-01	3.6E-08	8.3E-09	8.6E-09
			Total Pathway:	2.1E-08	Total Pathway:			Total Pathway:	2.8E-06	

Chemical Risk

Ingestion/Sediment					Dermal Contact/Sediment				Chemical Risk External RadiationSediment				
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	8.97E+01	3.1E-07	1.8E+00	5.3E-07	Arsenic	2.6E-07	1.8E+00	4.8E-07					1.0E-06
Beryllium	4.67E+00	1.6E-08	4.3E+00	6.8E-08	Beryllium			6.8E-08		Not Applicable			1.4E-07
Lead	5.48E+01	1.9E-07			Lead	1.6E-06							
			Total Pathway:	6.0E-07			Total Pathway:	5.5E-07			Total Pathway:		

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem	6.2E-07	Total Rad + Chem	5.5E-07	Total Rad + Chem	2.8E-06	*Total:*	4.0E-06

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TABLE B.3.1-5(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment				
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	5.29E+00	2.0E+01		
PU-238	7.20E-01	2.7E+00		
PU-239/240	3.30E-01	1.2E+00		
RA-226	4.60E+00	1.7E+01		
RA-228	3.18E+00	1.2E+01		
SR-90	4.47E+00	1.7E+01		
U-234	3.22E+00	1.2E+01		
U-235/236	1.43E-01	5.4E-01		
U-238	3.22E+00	1.2E+01		
			Total Pathway:	

Dermal Contact/Sediment
Not applicable
Total Pathway:

Chemical Hazard

Ingestion/Sediment				
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	8.97E+01	1.8E-06	3.0E-04	5.9E-03
Beryllium	4.67E+00	9.3E-08	5.0E-03	1.9E-05
Lead	5.48E+01	1.1E-06		
			Total Pathway:	6.0E-03
			Total Rad + Chem	6.0E-03

Dermal Contact/Sediment				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	1.5E-06	2.9E-04	5.3E-03	1.1E-02
Beryllium	7.9E-07	5.0E-05	1.6E-02	1.6E-02
Lead	9.3E-06			
		Total Pathway:	2.1E-02	
		Total Rad + Chem	2.1E-02	*Total:* 2.7E-02

TABLE B.3.1-6

CURRENT OFF-PROPERTY FARMER

ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
	Inhalation/Soil				Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.87E-07	8.0E-02	1.9E-11	1.5E-12	1.5E-12
NP-237	4.11E-06	4.8E-01	2.9E-08	1.4E-08	1.4E-08
PU-238	5.24E-07	6.1E-02	3.9E-08	2.4E-09	2.4E-09
PU-239/240	2.47E-07	2.9E-02	3.8E-08	1.1E-09	1.1E-09
RA-226	3.44E-06	4.0E-01	7.0E-09	2.8E-09	2.8E-09
RA-228	2.39E-06	2.8E-01	6.9E-10	1.9E-10	1.9E-10
SR-90	3.37E-06	3.9E-01	6.2E-11	2.4E-11	2.4E-11
TH-228	2.84E-06	3.3E-01	7.8E-08	2.6E-08	2.6E-08
TH-230	2.66E-06	3.1E-01	2.9E-08	8.9E-09	8.9E-09
TH-232	2.02E-06	2.3E-01	1.1E-07	2.6E-08	2.6E-08
U-234	2.69E-06	3.1E-01	2.6E-08	8.1E-09	8.1E-09
U-235/236	1.20E-07	1.4E-02	2.5E-08	3.5E-10	3.5E-10
U-238	2.69E-06	3.1E-01	5.2E-08	1.6E-08	1.6E-08
			Total Pathway:	1.1E-07	

Chemical Risk					
	Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.72E-08	4.4E-09	1.5E+01	6.5E-08	6.5E-08
Beryllium	3.52E-09	2.3E-10	8.4E+00	1.9E-09	1.9E-09
Lead	4.14E-08	2.7E-09			
Thallium	2.02E-09	1.3E-10			
TH-TOTAL	1.83E-08	1.2E-09			
2-Methylnaphthalene	4.19E-11	2.7E-12			
Benzo(a)anthracene	8.23E-11	5.3E-12	6.1E-01	3.3E-12	3.3E-12
Benzo(a)pyrene	8.98E-11	5.8E-12	6.1E+00	3.6E-11	3.6E-11
Benzo(b)fluoranthene	1.35E-10	8.7E-12	6.1E-01	5.3E-12	5.3E-12
Phenanthrene	1.57E-10	1.0E-11			
			Total Pathway:	6.7E-08	

Total Rad + Chem	1.7E-07	*Total:*	1.7E-07

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TABLE B.3.1-6

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard					Total
Inhalation/Soil					
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	6.87E-07	8.0E-02			
NP-237	4.11E-06	4.8E-01			
PU-238	5.24E-07	6.1E-02			
PU-239/240	2.47E-07	2.9E-02			
RA-226	3.44E-06	4.0E-01			
RA-228	2.39E-06	2.8E-01			
SR-90	3.37E-06	3.9E-01			
TH-228	2.84E-06	3.3E-01			
TH-230	2.66E-06	3.1E-01			
TH-232	2.02E-06	2.3E-01			
U-234	2.69E-06	3.1E-01			
U-235/236	1.20E-07	1.4E-02			
U-238	2.69E-06	3.1E-01			
			Total Pathway:		

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.72E-08	4.4E-09		
Beryllium	3.52E-09	2.3E-10		
Lead	4.14E-08	2.7E-09		
Thallium	2.02E-09	1.3E-10		
TH-TOTAL	1.83E-08	1.2E-09		
2-Methylnaphthalene	4.19E-11	2.7E-12		
Benzo(a)anthracene	8.23E-11	5.3E-12		
Benzo(a)pyrene	8.98E-11	5.8E-12		
Benzo(b)fluoranthene	1.35E-10	8.7E-12		
Phenanthrene	1.57E-10	1.0E-11		
			Total Pathway:	

Total Rad + Chem | *Total:*

TABLE B.3.1-7
CURRENT OFF-PROPERTY RESIDENT CHILD
ACTIVE FLYASH PILE: SURFACE SOIL/AIR
CARCINOGENIC RISK

Radiation Risk					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.87E-07	1.4E-03	1.9E-11	2.7E-14	2.7E-14
NP-237	4.11E-06	8.6E-03	2.9E-08	2.5E-10	2.5E-10
PU-238	5.24E-07	1.1E-03	3.9E-08	4.3E-11	4.3E-11
PU-239/240	2.47E-07	5.2E-04	3.8E-08	2.0E-11	2.0E-11
RA-226	3.44E-06	7.2E-03	7.0E-09	5.1E-11	5.1E-11
RA-228	2.39E-06	5.0E-03	6.9E-10	3.5E-12	3.5E-12
SR-90	3.37E-06	7.1E-03	6.2E-11	4.4E-13	4.4E-13
TH-228	2.84E-06	6.0E-03	7.8E-08	4.7E-10	4.7E-10
TH-230	2.66E-06	5.6E-03	2.9E-08	1.6E-10	1.6E-10
TH-232	2.02E-06	4.2E-03	1.1E-07	4.7E-10	4.7E-10
U-234	2.69E-06	5.6E-03	2.6E-08	1.5E-10	1.5E-10
U-235/236	1.20E-07	2.5E-04	2.5E-08	6.3E-12	6.3E-12
U-238	2.69E-06	5.6E-03	5.2E-08	2.9E-10	2.9E-10
			Total Pathway:	1.9E-09	

Chemical Risk					
Inhalation/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.72E-08	3.7E-10	1.5E+01	5.5E-09	5.5E-09
Beryllium	3.52E-09	1.9E-11	8.4E+00	1.6E-10	1.6E-10
Lead	4.14E-08	2.3E-10			
Thallium	2.02E-09	1.1E-11			
TH-TOTAL	1.83E-08	1.0E-10			
2-Methylnaphthalene	4.19E-11	2.3E-13			
Benzo(a)anthracene	8.23E-11	4.5E-13	6.1E-01	2.8E-13	2.8E-13
Benzo(a)pyrene	8.98E-11	4.9E-13	6.1E+00	3.0E-12	3.0E-12
Benzo(b)fluoranthene	1.35E-10	7.4E-13	6.1E-01	4.5E-13	4.5E-13
Phenanthrene	1.57E-10	8.6E-13			
			Total Pathway:	5.7E-09	

Total Rad + Chem	7.6E-09	*Total:*	7.6E-09

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TABLE B.3.1-7
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Inhalation/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	6.87E-07	1.4E-03		
NP-237	4.11E-06	8.6E-03		
PU-238	5.24E-07	1.1E-03		
PU-239/240	2.47E-07	5.2E-04		
RA-226	3.44E-06	7.2E-03		
RA-228	2.39E-06	5.0E-03		
SR-90	3.37E-06	7.1E-03		
TH-228	2.84E-06	6.0E-03		
TH-230	2.66E-06	5.6E-03		
TH-232	2.02E-06	4.2E-03		
U-234	2.69E-06	5.6E-03		
U-235/236	1.20E-07	2.5E-04		
U-238	2.69E-06	5.6E-03		
		Total Pathway:		

Total

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.72E-08	4.3E-09		
Beryllium	3.52E-09	2.3E-10		
Lead	4.14E-08	2.6E-09		
Thallium	2.02E-09	1.3E-10		
TH-TOTAL	1.83E-08	1.2E-09		
2-Methylnaphthalene	4.19E-11	2.7E-12		
Benzo(a)anthracene	8.23E-11	5.3E-12		
Benzo(a)pyrene	8.98E-11	5.7E-12		
Benzo(b)fluoranthene	1.35E-10	8.6E-12		
Phenanthrene	1.57E-10	1.0E-11		
		Total Pathway:		

Total Rad + Chem | *Total:*

TABLE B.3.1-8(a)

CURRENT OFF-PROPERTY FARMER

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.55E-03	2.8E+00	2.8E-11	8.0E-11	CS-137	5.43E-04	4.0E+00	2.8E-11	1.1E-10	1.9E-10
NP-237	1.11E-05	2.0E-02	2.2E-10	4.5E-12	NP-237	1.01E-06	7.4E-03	2.2E-10	1.6E-12	6.1E-12
PU-238	1.33E-08	2.4E-05	2.2E-10	5.4E-15	PU-238	2.66E-09	2.0E-05	2.2E-10	4.3E-15	9.7E-15
PU-239/240	6.72E-09	1.2E-05	2.3E-10	2.8E-15	PU-239/240	1.34E-09	9.9E-06	2.3E-10	2.3E-15	5.1E-15
RA-226	6.14E-05	1.1E-01	7.8E-10	8.8E-11	RA-226	1.11E-04	8.1E-01	7.8E-10	6.3E-10	7.2E-10
RA-228	2.71E-05	5.0E-02	1.0E-10	5.0E-12	RA-228	4.91E-05	3.6E-01	1.0E-10	3.6E-11	4.1E-11
SR-90	1.13E-04	2.1E-01	3.6E-11	7.5E-12	SR-90	5.68E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	6.91E-07	1.3E-03	5.5E-11	7.0E-14	TH-228	5.88E-07	4.3E-03	5.5E-11	2.4E-13	3.1E-13
TH-230	3.21E-06	5.9E-03	1.3E-11	7.7E-14	TH-230	2.68E-06	2.0E-02	1.3E-11	2.6E-13	3.3E-13
TH-232	2.45E-06	4.5E-03	1.7E-10	7.6E-13	TH-232	2.04E-06	1.5E-02	1.7E-10	2.5E-12	3.3E-12
U-234	2.32E-05	4.3E-02	1.6E-11	6.8E-13	U-234	6.97E-05	5.1E-01	1.6E-11	8.2E-12	8.9E-12
U-235/236	1.04E-06	1.9E-03	1.6E-11	3.0E-14	U-235/236	3.11E-06	2.3E-02	1.6E-11	3.7E-13	4.0E-13
U-238	2.32E-05	4.3E-02	2.8E-11	1.2E-12	U-238	6.97E-05	5.1E-01	2.8E-11	1.4E-11	1.6E-11
			Total Pathway:	1.9E-10				Total Pathway:	9.6E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.06E-05	2.1E-08	1.75E+00	3.7E-08	Arsenic	6.18E-07	2.5E-09	1.75E+00	4.4E-09	4.2E-08
Beryllium	3.45E-07	3.5E-10	4.30E+00	1.5E-09	Beryllium	3.11E-10	1.3E-12	4.30E+00	5.5E-12	1.5E-09
Lead	8.20E-07	8.4E-10			Lead	6.83E-07	2.8E-09			
Thallium	1.62E-05	1.7E-08			Thallium	8.11E-07	3.3E-09			
TH-TOTAL	2.22E-08	2.3E-11			TH-TOTAL	1.85E-08	7.6E-11			
2-Methylnaphthalene	1.46E-09	1.5E-12			2-Methylnaphthalene	4.63E-10	1.9E-12			
Benzo(a)anthracene	4.59E-08	4.7E-11	7.30E-01	3.4E-11	Benzo(a)anthracene	1.46E-08	6.0E-11	7.30E-01	4.4E-11	7.8E-11
Benzo(a)pyrene	1.33E-07	1.4E-10	7.30E+00	9.9E-10	Benzo(a)pyrene	4.21E-08	1.7E-10	7.30E+00	1.3E-09	2.3E-09
Benzo(b)fluoranthene	2.05E-07	2.1E-10	7.30E-01	1.5E-10	Benzo(b)fluoranthene	6.51E-08	2.7E-10	7.30E-01	2.0E-10	3.5E-10
Phenanthrene	6.47E-09	6.7E-12			Phenanthrene	2.08E-09	8.6E-12			
			Total Pathway:	4.0E-08				Total Pathway:	6.0E-09	
			Total Rad + Chem	4.0E-08				Total Rad + Chem	6.9E-09	*Total:* 4.7E-08

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TABLE B.3.1-8(a) (continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.5E-03	2.8E+00			CS-137	5.43E-04	4.0E+00			
NP-237	1.1E-05	2.0E-02			NP-237	1.01E-06	7.4E-03			
PU-238	1.3E-08	2.4E-05			PU-238	2.66E-09	2.0E-05			
PU-239/240	6.7E-09	1.2E-05			PU-239/240	1.34E-09	9.9E-06			
RA-226	6.1E-05	1.1E-01			RA-226	1.11E-04	8.1E-01			
RA-228	2.7E-05	5.0E-02			RA-228	4.91E-05	3.6E-01			
SR-90	1.1E-04	2.1E-01			SR-90	5.68E-04	4.2E+00			
TH-228	6.9E-07	1.3E-03			TH-228	5.88E-07	4.3E-03			
TH-230	3.2E-06	5.9E-03			TH-230	2.68E-06	2.0E-02			
TH-232	2.4E-06	4.5E-03			TH-232	2.04E-06	1.5E-02			
U-234	2.3E-05	4.3E-02			U-234	6.97E-05	5.1E-01			
U-235/236	1.0E-06	1.9E-03			U-235/236	3.11E-06	2.3E-02			
U-238	2.3E-05	4.3E-02			U-238	6.97E-05	5.1E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-05	2.1E-08	3.0E-04	7.1E-05	Arsenic	6.18E-07	2.5E-09	3.0E-04	8.5E-06	7.9E-05
Beryllium	3.5E-07	3.5E-10	5.0E-03	7.1E-08	Beryllium	3.11E-10	1.3E-12	5.0E-03	2.6E-10	7.1E-08
Lead	8.2E-07	8.4E-10			Lead	6.83E-07	2.8E-09			
Thallium	1.6E-05	1.7E-08	7.0E-05	2.4E-04	Thallium	8.11E-07	3.3E-09	7.0E-05	4.8E-05	2.9E-04
TH-TOTAL	2.2E-08	2.3E-11			TH-TOTAL	1.85E-08	7.6E-11			
2-Methylnaphthalene	1.5E-09	1.5E-12			2-Methylnaphthalene	4.63E-10	1.9E-12			
Benzo(a)anthracene	4.6E-08	4.7E-11			Benzo(a)anthracene	1.46E-08	6.0E-11			
Benzo(a)pyrene	1.3E-07	1.4E-10			Benzo(a)pyrene	4.21E-08	1.7E-10			
Benzo(b)fluoranthen	2.0E-07	2.1E-10			Benzo(b)fluoranthen	6.51E-08	2.7E-10			
Phenanthrene	6.5E-09	6.7E-12			Phenanthrene	2.08E-09	8.6E-12			
		Total Pathway:		3.1E-04			Total Pathway:		5.6E-05	

Total Rad + Chem 3.1E-04

Total Rad + Chem 5.6E-05 *Total:* 3.6E-04

TABLE B.3.1-8(b)

CURRENT OFF-PROPERTY CHILD

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.55E-03	9.4E-02	2.8E-11	2.6E-12	CS-137	5.43E-04	7.8E-01	2.8E-11	2.2E-11	2.4E-11
NP-237	1.11E-05	6.8E-04	2.2E-10	1.5E-13	NP-237	1.01E-06	1.4E-03	2.2E-10	3.2E-13	4.7E-13
PU-238	1.33E-08	8.1E-07	2.2E-10	1.8E-16	PU-238	2.66E-09	3.8E-06	2.2E-10	8.4E-16	1.0E-15
PU-239/240	6.72E-09	4.1E-07	2.3E-10	9.4E-17	PU-239/240	1.34E-09	1.9E-06	2.3E-10	4.4E-16	5.4E-16
RA-226	6.14E-05	3.7E-03	7.8E-10	2.9E-12	RA-226	1.11E-04	1.6E-01	7.8E-10	1.2E-10	1.3E-10
RA-228	2.71E-05	1.6E-03	1.0E-10	1.6E-13	RA-228	4.91E-05	7.0E-02	1.0E-10	7.0E-12	7.2E-12
SR-90	1.13E-04	6.9E-03	3.6E-11	2.5E-13	SR-90	5.68E-04	8.1E-01	3.6E-11	2.9E-11	2.9E-11
TH-228	6.91E-07	4.2E-05	5.5E-11	2.3E-15	TH-228	5.88E-07	8.4E-04	5.5E-11	4.6E-14	4.8E-14
TH-230	3.21E-06	2.0E-04	1.3E-11	2.5E-15	TH-230	2.68E-06	3.8E-03	1.3E-11	5.0E-14	5.2E-14
TH-232	2.45E-06	1.5E-04	1.7E-10	2.5E-14	TH-232	2.04E-06	2.9E-03	1.7E-10	4.9E-13	5.2E-13
U-234	2.32E-05	1.4E-03	1.6E-11	2.3E-14	U-234	6.97E-05	1.0E-01	1.6E-11	1.6E-12	1.6E-12
U-235/236	1.04E-06	6.3E-05	1.6E-11	1.0E-15	U-235/236	3.11E-06	4.4E-03	1.6E-11	7.1E-14	7.2E-14
U-238	2.32E-05	1.4E-03	2.8E-11	4.0E-14	U-238	6.97E-05	1.0E-01	2.8E-11	2.8E-12	2.8E-12
			Total Pathway:	6.2E-12				Total Pathway:	1.9E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.06E-05	3.3E-09	1.75E+00	5.7E-09	Arsenic	6.18E-07	2.3E-09	1.75E+00	4.0E-09	9.8E-09
Beryllium	3.45E-07	5.5E-11	4.30E+00	2.4E-10	Beryllium	3.11E-10	1.2E-12	4.30E+00	5.0E-12	2.4E-10
Lead	8.20E-07	1.3E-10			Lead	6.83E-07	2.5E-09			
Thallium	1.62E-05	2.6E-09			Thallium	8.11E-07	3.0E-09			
TH-TOTAL	2.22E-08	3.5E-12			TH-TOTAL	1.85E-08	6.9E-11			
2-Methylnaphthalene	1.46E-09	2.3E-13			2-Methylnaphthalene	4.63E-10	1.7E-12			
Benzo(a)anthracene	4.59E-08	7.3E-12	7.30E-01	5.3E-12	Benzo(a)anthracene	1.46E-08	5.4E-11	7.30E-01	4.0E-11	4.5E-11
Benzo(a)pyrene	1.33E-07	2.1E-11	7.30E+00	1.5E-10	Benzo(a)pyrene	4.21E-08	1.6E-10	7.30E+00	1.1E-09	1.3E-09
Benzo(b)fluoranthen	2.05E-07	3.3E-11	7.30E-01	2.4E-11	Benzo(b)fluoranthen	6.51E-08	2.4E-10	7.30E-01	1.8E-10	2.0E-10
Phenanthrene	6.47E-09	1.0E-12			Phenanthrene	2.08E-09	7.8E-12			
			Total Pathway:	6.2E-09				Total Pathway:	5.4E-09	
			Total Rad + Chem	6.2E-09				Total Rad + Chem	5.6E-09	*Total:* 1.2E-08

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NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	1.5E-03	9.4E-02		
NP-237	1.1E-05	6.8E-04		
PU-238	1.3E-08	8.1E-07		
PU-239/240	6.7E-09	4.1E-07		
RA-226	6.1E-05	3.7E-03		
RA-228	2.7E-05	1.6E-03		
SR-90	1.1E-04	6.9E-03		
TH-228	6.9E-07	4.2E-05		
TH-230	3.2E-06	2.0E-04		
TH-232	2.4E-06	1.5E-04		
U-234	2.3E-05	1.4E-03		
U-235/236	1.0E-06	6.3E-05		
U-238	2.3E-05	1.4E-03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	5.43E-04	7.8E-01		
NP-237	1.01E-06	1.4E-03		
PU-238	2.66E-09	3.8E-06		
PU-239/240	1.34E-09	1.9E-06		
RA-226	1.11E-04	1.6E-01		
RA-228	4.91E-05	7.0E-02		
SR-90	5.68E-04	8.1E-01		
TH-228	5.88E-07	8.4E-04		
TH-230	2.68E-06	3.8E-03		
TH-232	2.04E-06	2.9E-03		
U-234	6.97E-05	1.0E-01		
U-235/236	3.11E-06	4.4E-03		
U-238	6.97E-05	1.0E-01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.1E-05	3.8E-08	3.0E-04	1.3E-04
Beryllium	3.5E-07	6.4E-10	5.0E-03	1.3E-07
Lead	8.2E-07	1.5E-09		
Thallium	1.6E-05	3.0E-08	7.0E-05	4.3E-04
TH-TOTAL	2.2E-08	4.1E-11		
2-Methylnaphthalene	1.5E-09	2.7E-12		
Benzo(a)anthracene	4.6E-08	8.5E-11		
Benzo(a)pyrene	1.3E-07	2.5E-10		
Benzo(b)fluoranthen	2.0E-07	3.8E-10		
Phenanthrene	6.5E-09	1.2E-11		

Total Pathway: 5.6E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	6.18E-07	2.7E-08	3.0E-04	9.0E-05
Beryllium	3.11E-10	1.4E-11	5.0E-03	2.7E-09
Lead	6.83E-07	3.0E-08		
Thallium	8.11E-07	3.5E-08	7.0E-05	5.0E-04
TH-TOTAL	1.85E-08	8.0E-10		
2-Methylnaphthalene	4.63E-10	2.0E-11		
Benzo(a)anthracene	1.46E-08	6.3E-10		
Benzo(a)pyrene	4.21E-08	1.8E-09		
Benzo(b)fluoranthen	6.51E-08	2.8E-09		
Phenanthrene	2.08E-09	9.1E-11		

Total Pathway: 5.9E-04

Total
2.2E-04
1.3E-07
9.3E-04

Total Rad + Chem 5.6E-04

Total Rad + Chem 5.9E-04 *Total:* 1.2E-03

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TABLE B.3.1-9 (a)

CURRENT OFF-PROPERTY FARMER

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.74E-07	9.3E-01	2.8E-11	2.6E-11	CS-137	4.73E-07	4.9E-01	2.8E-11	1.4E-11	4.0E-11
NP-237	2.03E-06	4.0E+00	2.2E-10	8.8E-10	NP-237	2.03E-06	2.1E+00	2.2E-10	4.7E-10	1.3E-09
PU-238	2.57E-07	5.1E-01	2.2E-10	1.1E-10	PU-238	2.56E-07	2.7E-01	2.2E-10	5.9E-11	1.7E-10
PU-239/240	1.21E-07	2.4E-01	2.3E-10	5.5E-11	PU-239/240	1.21E-07	1.3E-01	2.3E-10	2.9E-11	8.4E-11
RA-226	1.73E-06	3.4E+00	7.8E-10	2.7E-09	RA-226	1.73E-06	1.8E+00	7.8E-10	1.4E-09	4.1E-09
RA-228	1.17E-06	2.3E+00	1.0E-10	2.3E-10	RA-228	1.16E-06	1.2E+00	1.0E-10	1.2E-10	3.5E-10
SR-90	1.85E-06	3.6E+00	3.6E-11	1.3E-10	SR-90	1.85E-06	1.9E+00	3.6E-11	6.9E-11	2.0E-10
TH-228	1.39E-06	2.7E+00	5.5E-11	1.5E-10	TH-228	1.35E-06	1.4E+00	5.5E-11	7.7E-11	2.3E-10
TH-230	1.33E-06	2.6E+00	1.3E-11	3.4E-11	TH-230	1.33E-06	1.4E+00	1.3E-11	1.8E-11	5.2E-11
TH-232	1.01E-06	2.0E+00	1.7E-10	3.4E-10	TH-232	1.01E-06	1.1E+00	1.7E-10	1.8E-10	5.2E-10
U-234	1.32E-06	2.6E+00	1.6E-11	4.2E-11	U-234	1.32E-06	1.4E+00	1.6E-11	2.2E-11	6.4E-11
U-235/236	5.88E-08	1.2E-01	1.6E-11	1.9E-12	U-235/236	5.88E-08	6.1E-02	1.6E-11	9.8E-13	2.8E-12
U-238	1.32E-06	2.6E+00	2.8E-11	7.3E-11	U-238	1.32E-06	1.4E+00	2.8E-11	3.9E-11	1.1E-10
			Total Pathway:	4.7E-09				Total Pathway:	2.5E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.05E-05	4.5E-08	1.8E+00	7.8E-08	Arsenic	4.05E-05	2.4E-08	1.8E+00	4.1E-08	1.2E-07
Beryllium	1.85E-06	2.0E-09	4.3E+00	8.7E-09	Beryllium	1.85E-06	1.1E-09	4.3E+00	4.6E-09	1.3E-08
Lead	2.16E-05	2.4E-08			Lead	2.16E-05	1.3E-08			
Thallium	1.07E-06	1.2E-09			Thallium	1.07E-06	6.2E-10			
TH-TOTAL	9.15E-06	1.0E-08			TH-TOTAL	9.15E-06	5.3E-09			
2-Methylnaphthalen	7.18E-08	7.9E-11			2-Methylnaphthalene	7.18E-08	4.2E-11			
Benzo(a)anthracene	4.33E-08	4.8E-11	7.3E-01	3.5E-11	Benzo(a)anthracene	4.30E-08	2.5E-11	7.3E-01	1.8E-11	5.3E-11
Benzo(a)pyrene	4.58E-08	5.0E-11	7.3E+00	3.7E-10	Benzo(a)pyrene	4.55E-08	2.7E-11	7.3E+00	1.9E-10	5.6E-10
Benzo(b)fluoranthen	6.84E-08	7.5E-11	7.3E-01	5.5E-11	Benzo(b)fluoranthene	6.78E-08	4.0E-11	7.3E-01	2.9E-11	8.4E-11
Phenanthrene	8.16E-08	9.0E-11			Phenanthrene	7.96E-08	4.6E-11			
			Total Pathway:	8.7E-08				Total Pathway:	4.6E-08	
			Total Rad + Chem	9.2E-08				Total Rad + Chem	4.9E-08	*Total:* 1.4E-07

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TABLE B.3.1-9 (a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.7E-07	9.3E-01		
NP-237	2.0E-06	4.0E+00		
PU-238	2.6E-07	5.1E-01		
PU-239/240	1.2E-07	2.4E-01		
RA-226	1.7E-06	3.4E+00		
RA-228	1.2E-06	2.3E+00		
SR-90	1.8E-06	3.6E+00		
TH-228	1.4E-06	2.7E+00		
TH-230	1.3E-06	2.6E+00		
TH-232	1.0E-06	2.0E+00		
U-234	1.3E-06	2.6E+00		
U-235/236	5.9E-08	1.2E-01		
U-238	1.3E-06	2.6E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.73E-07	4.9E-01		
NP-237	2.03E-06	2.1E+00		
PU-238	2.56E-07	2.7E-01		
PU-239/240	1.21E-07	1.3E-01		
RA-226	1.73E-06	1.8E+00		
RA-228	1.16E-06	1.2E+00		
SR-90	1.85E-06	1.9E+00		
TH-228	1.35E-06	1.4E+00		
TH-230	1.33E-06	1.4E+00		
TH-232	1.01E-06	1.1E+00		
U-234	1.32E-06	1.4E+00		
U-235/236	5.88E-08	6.1E-02		
U-238	1.32E-06	1.4E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.1E-05	4.5E-08	3.0E-04	1.5E-04
Beryllium	1.8E-06	2.0E-09	5.0E-03	4.1E-07
Lead	2.2E-05	2.4E-08		
Thallium	1.1E-06	1.2E-09	7.0E-05	1.7E-05
TH-TOTAL	9.1E-06	1.0E-08		
2-Methylnaphthalene	7.2E-08	7.9E-11		
Benzo(a)anthracene	4.3E-08	4.8E-11		
Benzo(a)pyrene	4.6E-08	5.0E-11		
Benzo(b)fluoranthene	6.8E-08	7.5E-11		
Phenanthrene	8.2E-08	9.0E-11		

Total Pathway: 1.7E-04

Total Rad + Chem 1.7E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.05E-05	2.4E-08	3.0E-04	7.9E-05
Beryllium	1.85E-06	1.1E-09	5.0E-03	2.2E-07
Lead	2.16E-05	1.3E-08		
Thallium	1.07E-06	6.2E-10	7.0E-05	8.9E-06
TH-TOTAL	9.15E-06	5.3E-09		
2-Methylnaphthalene	7.18E-08	4.2E-11		
Benzo(a)anthracene	4.30E-08	2.5E-11		
Benzo(a)pyrene	4.55E-08	2.7E-11		
Benzo(b)fluoranthene	6.78E-08	4.0E-11		
Phenanthrene	7.96E-08	4.6E-11		

Total Pathway: 8.8E-05

Total Rad + Chem 8.8E-05

2.3E-04	
6.2E-07	
2.6E-05	
Total:	2.5E-04

TABLE B.3.1-9 (b)

CURRENT OFF-PROPERTY CHILD

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.74E-07	4.0E-02	2.8E-11	1.1E-12	CS-137	4.73E-07	6.1E-02	2.8E-11	1.7E-12	2.8E-12
NP-237	2.03E-06	1.7E-01	2.2E-10	3.8E-11	NP-237	2.03E-06	2.6E-01	2.2E-10	5.7E-11	9.5E-11
PU-238	2.57E-07	2.2E-02	2.2E-10	4.7E-12	PU-238	2.56E-07	3.3E-02	2.2E-10	7.2E-12	1.2E-11
PU-239/240	1.21E-07	1.0E-02	2.3E-10	2.3E-12	PU-239/240	1.21E-07	1.6E-02	2.3E-10	3.6E-12	5.9E-12
RA-226	1.73E-06	1.5E-01	7.8E-10	1.1E-10	RA-226	1.73E-06	2.2E-01	7.8E-10	1.7E-10	2.9E-10
RA-228	1.17E-06	9.9E-02	1.0E-10	9.9E-12	RA-228	1.16E-06	1.5E-01	1.0E-10	1.5E-11	2.5E-11
SR-90	1.85E-06	1.6E-01	3.6E-11	5.6E-12	SR-90	1.85E-06	2.4E-01	3.6E-11	8.5E-12	1.4E-11
TH-228	1.39E-06	1.2E-01	5.5E-11	6.4E-12	TH-228	1.35E-06	1.7E-01	5.5E-11	9.5E-12	1.6E-11
TH-230	1.33E-06	1.1E-01	1.3E-11	1.5E-12	TH-230	1.33E-06	1.7E-01	1.3E-11	2.2E-12	3.7E-12
TH-232	1.01E-06	8.5E-02	1.7E-10	1.4E-11	TH-232	1.01E-06	1.3E-01	1.7E-10	2.2E-11	3.6E-11
U-234	1.32E-06	1.1E-01	1.6E-11	1.8E-12	U-234	1.32E-06	1.7E-01	1.6E-11	2.7E-12	4.5E-12
U-235/236	5.88E-08	4.9E-03	1.6E-11	7.9E-14	U-235/236	5.88E-08	7.6E-03	1.6E-11	1.2E-13	2.0E-13
U-238	1.32E-06	1.1E-01	2.8E-11	3.1E-12	U-238	1.32E-06	1.7E-01	2.8E-11	4.7E-12	7.8E-12
			Total Pathway:	2.0E-10				Total Pathway:	3.1E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.05E-05	8.9E-09	1.8E+00	1.6E-08	Arsenic	4.05E-05	1.4E-08	1.8E+00	2.4E-08	3.9E-08
Beryllium	1.85E-06	4.0E-10	4.3E+00	1.7E-09	Beryllium	1.85E-06	6.2E-10	4.3E+00	2.7E-09	4.4E-09
Lead	2.16E-05	4.7E-09			Lead	2.16E-05	7.2E-09			
Thallium	1.07E-06	2.3E-10			Thallium	1.07E-06	3.6E-10			
TH-TOTAL	9.15E-06	2.0E-09			TH-TOTAL	9.15E-06	3.1E-09			
2-Methylnaphthalen	7.18E-08	1.6E-11			2-Methylnaphthalene	7.18E-08	2.4E-11			
Benzo(a)anthracene	4.33E-08	9.5E-12	7.3E-01	6.9E-12	Benzo(a)anthracene	4.30E-08	1.4E-11	7.3E-01	1.1E-11	1.7E-11
Benzo(a)pyrene	4.58E-08	1.0E-11	7.3E+00	7.3E-11	Benzo(a)pyrene	4.55E-08	1.5E-11	7.3E+00	1.1E-10	1.8E-10
Benzo(b)fluoranthen	6.84E-08	1.5E-11	7.3E-01	1.1E-11	Benzo(b)fluoranthene	6.78E-08	2.3E-11	7.3E-01	1.7E-11	2.8E-11
Phenanthrene	8.16E-08	1.8E-11			Phenanthrene	7.96E-08	2.7E-11			
			Total Pathway:	1.7E-08				Total Pathway:	2.7E-08	
			Total Rad + Chem	1.8E-08				Total Rad + Chem	2.7E-08	*Total:* 4.4E-08

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TABLE B.3.1-9 (b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	4.7E-07	4.0E-02			CS-137	4.73E-07	6.1E-02			
NP-237	2.0E-06	1.7E-01			NP-237	2.03E-06	2.6E-01			
PU-238	2.6E-07	2.2E-02			PU-238	2.56E-07	3.3E-02			
PU-239/240	1.2E-07	1.0E-02			PU-239/240	1.21E-07	1.6E-02			
RA-226	1.7E-06	1.5E-01			RA-226	1.73E-06	2.2E-01			
RA-228	1.2E-06	9.9E-02			RA-228	1.16E-06	1.5E-01			
SR-90	1.8E-06	1.6E-01			SR-90	1.85E-06	2.4E-01			
TH-228	1.4E-06	1.2E-01			TH-228	1.35E-06	1.7E-01			
TH-230	1.3E-06	1.1E-01			TH-230	1.33E-06	1.7E-01			
TH-232	1.0E-06	8.5E-02			TH-232	1.01E-06	1.3E-01			
U-234	1.3E-06	1.1E-01			U-234	1.32E-06	1.7E-01			
U-235/236	5.9E-08	4.9E-03			U-235/236	5.88E-08	7.6E-03			
U-238	1.3E-06	1.1E-01			U-238	1.32E-06	1.7E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	4.1E-05	1.0E-07	3.0E-04	3.5E-04	Arsenic	4.05E-05	1.6E-07	3.0E-04	5.3E-04	8.7E-04
Beryllium	1.8E-06	4.7E-09	5.0E-03	9.4E-07	Beryllium	1.85E-06	7.2E-09	5.0E-03	1.4E-06	2.4E-06
Lead	2.2E-05	5.5E-08			Lead	2.16E-05	8.5E-08			
Thallium	1.1E-06	2.7E-09	7.0E-05	3.9E-05	Thallium	1.07E-06	4.2E-09	7.0E-05	6.0E-05	9.9E-05
TH-TOTAL	9.1E-06	2.3E-08			TH-TOTAL	9.15E-06	3.6E-08			
2-Methylnaphthalene	7.2E-08	1.8E-10			2-Methylnaphthalene	7.18E-08	2.8E-10			
Benzo(a)anthracene	4.3E-08	1.1E-10			Benzo(a)anthracene	4.30E-08	1.7E-10			
Benzo(a)pyrene	4.6E-08	1.2E-10			Benzo(a)pyrene	4.55E-08	1.8E-10			
Benzo(b)fluoranthene	6.8E-08	1.7E-10			Benzo(b)fluoranthene	6.78E-08	2.7E-10			
Phenanthrene	8.2E-08	2.1E-10			Phenanthrene	7.96E-08	3.1E-10			
		Total Pathway:		3.9E-04			Total Pathway:		5.9E-04	
		Total Rad + Chem		3.9E-04			Total Rad + Chem		5.9E-04	*Total:* 9.7E-04

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TABLE B.3.1-10

CURRENT USER OF MILK AND MEAT

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.56E-02	2.9E+01	2.8E-11	8.0E-10	CS-137	5.46E-03	4.0E+01	2.8E-11	1.1E-09	1.9E-09
NP-237	1.12E-04	2.0E-01	2.2E-10	4.5E-11	NP-237	1.01E-05	7.5E-02	2.2E-10	1.6E-11	6.1E-11
PU-238	1.33E-07	2.4E-04	2.2E-10	5.4E-14	PU-238	2.66E-08	2.0E-04	2.2E-10	4.3E-14	9.7E-14
PU-239/240	6.75E-08	1.2E-04	2.3E-10	2.9E-14	PU-239/240	1.35E-08	9.9E-05	2.3E-10	2.3E-14	5.1E-14
RA-226	6.16E-04	1.1E+00	7.8E-10	8.8E-10	RA-226	1.11E-03	8.1E+00	7.8E-10	6.4E-09	7.2E-09
RA-228	2.72E-04	5.0E-01	1.0E-10	5.0E-11	RA-228	4.93E-04	3.6E+00	1.0E-10	3.6E-10	4.1E-10
SR-90	1.14E-03	2.1E+00	3.6E-11	7.5E-11	SR-90	5.70E-03	4.2E+01	3.6E-11	1.5E-09	1.6E-09
TH-228	6.94E-06	1.3E-02	5.5E-11	7.0E-13	TH-228	5.90E-06	4.3E-02	5.5E-11	2.4E-12	3.1E-12
TH-230	3.22E-05	5.9E-02	1.3E-11	7.7E-13	TH-230	2.69E-05	2.0E-01	1.3E-11	2.6E-12	3.3E-12
TH-232	2.46E-05	4.5E-02	1.7E-10	7.7E-12	TH-232	2.05E-05	1.5E-01	1.7E-10	2.6E-11	3.3E-11
U-234	2.33E-04	4.3E-01	1.6E-11	6.9E-12	U-234	7.00E-04	5.1E+00	1.6E-11	8.2E-11	8.9E-11
U-235/236	1.04E-05	1.9E-02	1.6E-11	3.0E-13	U-235/236	3.11E-05	2.3E-01	1.6E-11	3.7E-12	4.0E-12
U-238	2.33E-04	4.3E-01	2.8E-11	1.2E-11	U-238	7.00E-04	5.1E+00	2.8E-11	1.4E-10	1.6E-10
			Total Pathway:	1.9E-09				Total Pathway:	9.6E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.07E-04	2.1E-07	1.8E+00	3.7E-07	Arsenic	6.20E-06	2.5E-08	1.8E+00	4.5E-08	4.2E-07
Beryllium	3.46E-06	3.6E-09	4.3E+00	1.5E-08	Beryllium	3.12E-09	1.3E-11	4.3E+00	5.5E-11	1.5E-08
Lead	8.24E-06	8.5E-09			Lead	6.87E-06	2.8E-08			
Thallium	1.63E-04	1.7E-07			Thallium	8.15E-06	3.4E-08			
TH-TOTAL	2.23E-07	2.3E-10			TH-TOTAL	1.86E-07	7.6E-10			
2-Methylnaphthalene	1.47E-08	1.5E-11			2-Methylnaphthalene	4.65E-09	1.9E-11			
Benzo(a)anthracene	4.61E-07	4.7E-10	7.3E-01	3.5E-10	Benzo(a)anthracene	1.46E-07	6.0E-10	7.3E-01	4.4E-10	7.9E-10
Benzo(a)pyrene	1.33E-06	1.4E-09	7.3E+00	1.0E-08	Benzo(a)pyrene	4.23E-07	1.7E-09	7.3E+00	1.3E-08	2.3E-08
Benzo(b)fluoranthene	2.05E-06	2.1E-09	7.3E-01	1.5E-09	Benzo(b)fluoranthene	6.51E-07	2.7E-09	7.3E-01	2.0E-09	3.5E-09
Phenanthrene	6.51E-08	6.7E-11			Phenanthrene	2.10E-08	8.6E-11			
			Total Pathway:	4.0E-07				Total Pathway:	6.0E-08	
			Total Rad + Chem	4.0E-07				Total Rad + Chem	6.9E-08	*Total:* 4.7E-07

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TABLE B.3.1-10

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.6E-02	2.9E+01			CS-137	5.46E-03	4.0E+01			
NP-237	1.1E-04	2.0E-01			NP-237	1.01E-05	7.5E-02			
PU-238	1.3E-07	2.4E-04			PU-238	2.66E-08	2.0E-04			
PU-239/240	6.7E-08	1.2E-04			PU-239/240	1.35E-08	9.9E-05			
RA-226	6.2E-04	1.1E+00			RA-226	1.11E-03	8.1E+00			
RA-228	2.7E-04	5.0E-01			RA-228	4.93E-04	3.6E+00			
SR-90	1.1E-03	2.1E+00			SR-90	5.70E-03	4.2E+01			
TH-228	6.9E-06	1.3E-02			TH-228	5.90E-06	4.3E-02			
TH-230	3.2E-05	5.9E-02			TH-230	2.69E-05	2.0E-01			
TH-232	2.5E-05	4.5E-02			TH-232	2.05E-05	1.5E-01			
U-234	2.3E-04	4.3E-01			U-234	7.00E-04	5.1E+00			
U-235/236	1.0E-05	1.9E-02			U-235/236	3.11E-05	2.3E-01			
U-238	2.3E-04	4.3E-01			U-238	7.00E-04	5.1E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-04	2.1E-07	3.0E-04	7.1E-04	Arsenic	6.20E-06	2.5E-08	3.0E-04	8.5E-05	7.9E-04
Beryllium	3.5E-06	3.6E-09	5.0E-03	7.1E-07	Beryllium	3.12E-09	1.3E-11	5.0E-03	2.6E-09	7.1E-07
Lead	8.2E-06	8.5E-09			Lead	6.87E-06	2.8E-08			
Thallium	1.6E-04	1.7E-07	7.0E-05	2.4E-03	Thallium	8.15E-06	3.4E-08	7.0E-05	4.8E-04	2.9E-03
TH-TOTAL	2.2E-07	2.3E-10			TH-TOTAL	1.86E-07	7.6E-10			
2-Methylnaphthalene	1.5E-08	1.5E-11			2-Methylnaphthalene	4.65E-09	1.9E-11			
Benzo(a)anthracene	4.6E-07	4.7E-10			Benzo(a)anthracene	1.46E-07	6.0E-10			
Benzo(a)pyrene	1.3E-06	1.4E-09			Benzo(a)pyrene	4.23E-07	1.7E-09			
Benzo(b)fluoranthene	2.0E-06	2.1E-09			Benzo(b)fluoranthene	6.51E-07	2.7E-09			
Phenanthrene	6.5E-08	6.7E-11			Phenanthrene	2.10E-08	8.6E-11			
		Total Pathway:		3.1E-03			Total Pathway:		5.6E-04	

Total Rad + Chem 3.1E-03

Total Rad + Chem 5.6E-04 *Total:* 3.7E-03

TABLE B.3.1-11
CURRENT, GROUNDSKEEPER
ACTIVE FLYASH PILE: SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	9.47E-06	1.7E-01	1.9E-11	3.1E-12
NP-237	5.67E-05	9.9E-01	2.9E-08	2.9E-08
PU-238	7.21E-06	1.3E-01	3.9E-08	4.9E-09
PU-239/240	3.30E-06	5.8E-02	3.8E-08	2.2E-09
RA-226	4.74E-05	8.3E-01	7.0E-09	5.8E-09
RA-228	3.30E-05	5.8E-01	6.9E-10	4.0E-10
SR-90	4.64E-05	8.1E-01	6.2E-11	5.0E-11
TH-228	3.91E-05	6.8E-01	7.8E-08	5.3E-08
TH-230	3.66E-05	6.4E-01	2.9E-08	1.9E-08
TH-232	2.78E-05	4.9E-01	1.1E-07	5.4E-08
U-234	3.71E-05	6.5E-01	2.6E-08	1.7E-08
U-235/236	1.65E-06	2.9E-02	2.5E-08	7.2E-10
U-238	3.71E-05	6.5E-01	5.2E-08	3.4E-08
			Total Pathway:	2.2E-07

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	9.19E-01	8.0E+01	2.8E-11	2.3E-09
NP-237	5.48E+00	4.8E+02	2.2E-10	1.1E-07
PU-238	7.22E-01	6.3E+01	2.2E-10	1.4E-08
PU-239/240	3.30E-01	2.9E+01	2.3E-10	6.6E-09
RA-226	4.61E+00	4.0E+02	7.8E-10	3.1E-07
RA-228	3.17E+00	2.8E+02	1.0E-10	2.8E-08
SR-90	4.47E+00	3.9E+02	3.6E-11	1.4E-08
TH-228	3.81E+00	3.3E+02	5.5E-11	1.8E-08
TH-230	3.55E+00	3.1E+02	1.3E-11	4.0E-09
TH-232	2.67E+00	2.3E+02	1.7E-10	4.0E-08
U-234	3.60E+00	3.1E+02	1.6E-11	5.0E-09
U-235/236	1.60E-01	1.4E+01	1.6E-11	2.2E-10
U-238	3.61E+00	3.2E+02	2.8E-11	8.8E-09
			Total Pathway:	5.6E-07

Chemical Risk

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Arsenic	9.25E-07	9.1E-09	1.5E+01	1.4E-07
Beryllium	4.84E-08	4.7E-10	8.40E+00	4.0E-09
Lead	5.71E-07	5.6E-09		
Thallium	2.78E-08	2.7E-10		
TH-TOTAL	2.53E-07	2.5E-09		
2-Methylnaphthalene	5.77E-10	5.6E-12		
Benzo(a)anthracene	1.13E-09	1.1E-11	6.10E-01	6.7E-12
Benzo(a)pyrene	1.24E-09	1.2E-11	6.10E+00	7.4E-11
Benzo(b)fluoranthene	1.85E-09	1.8E-11	6.10E-01	1.1E-11
Phenanthrene	2.16E-09	2.1E-11		
			Total Pathway:	1.4E-07
			Total Rad + Chem	3.6E-07

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	8.98E+01	4.4E-06	1.8E+00	7.7E-06
Beryllium	4.67E+00	2.3E-07	4.3E+00	9.8E-07
Lead	5.54E+01	2.7E-06		
Thallium	2.66E+00	1.3E-07		
TH-TOTAL	2.45E+01	1.2E-06		
2-Methylnaphthalene	5.60E-02	2.7E-09		
Benzo(a)anthracene	1.10E-01	5.4E-09	7.30E-01	3.9E-09
Benzo(a)pyrene	1.20E-01	5.9E-09	7.30E+00	4.3E-08
Benzo(b)fluoranthene	1.80E-01	8.8E-09	7.30E-01	6.4E-09
Phenanthrene	2.10E-01	1.0E-08		
			Total Pathway:	8.7E-06
			Total Rad + Chem	9.3E-06

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TABLE B.3.1-11
(continued)

CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable (1)	CS-137	7.3E-01	2.0E-06	1.5E-06	1.5E-06
	NP-237	4.4E+00	4.3E-07	1.9E-06	2.0E-06
	PU-238	5.8E-01	2.8E-11	1.6E-11	1.9E-08
	PU-239/240	2.6E-01	2.7E-11	7.1E-12	8.8E-09
	RA-226	3.7E+00	6.0E-06	2.2E-05	2.2E-05
	RA-228	2.5E+00	2.9E-06	7.3E-06	7.4E-06
	SR-90	3.6E+00			1.4E-08
	TH-228	3.0E+00	5.6E-06	1.7E-05	1.7E-05
	TH-230	2.8E+00	5.4E-11	1.5E-10	2.3E-08
	TH-232	2.1E+00	8.5E-06	1.8E-05	1.8E-05
	U-234	2.9E+00	3.0E-11	8.6E-11	2.2E-08
	U-235/236	1.3E-01	2.4E-07	3.1E-08	3.2E-08
	U-238	2.9E+00	3.6E-08	1.0E-07	1.5E-07
Total Pathway:			Total Pathway:	6.8E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Arsenic	2.5E-07	1.8E+00	4.7E-07					8.3E-06
Beryllium			9.8E-07					2.0E-06
Lead	1.6E-06							
Thallium	7.5E-08							
TH-TOTAL				Not applicable				
2-Methylnaphthalene	4.7E-08							
Benzo(a)anthracene			3.9E-09					7.9E-09
Benzo(a)pyrene			4.3E-08					8.6E-08
Benzo(b)fluoranthene			6.4E-09					1.3E-08
Phenanthrene	1.8E-07							
Total Pathway:			1.5E-06	Total Pathway:				

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.5E-06 6.8E-05 *Total:* 7.9E-05

TABLE B.3.1-11
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3	Intake	RfD(i)	HQ
CS-137	9.47E-06	1.7E-01		
NP-237	5.67E-05	9.9E-01		
PU-238	7.21E-06	1.3E-01		
PU-239/240	3.30E-06	5.8E-02		
RA-226	4.74E-05	8.3E-01		
RA-228	3.30E-05	5.8E-01		
SR-90	4.64E-05	8.1E-01		
TH-228	3.91E-05	6.8E-01		
TH-230	3.66E-05	6.4E-01		
TH-232	2.78E-05	4.9E-01		
U-234	3.71E-05	6.5E-01		
U-235/236	1.65E-06	2.9E-02		
U-238	3.71E-05	6.5E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	HQ
CS-137	9.19E-01	8.0E+01		
NP-237	5.48E+00	4.8E+02		
PU-238	7.22E-01	6.3E+01		
PU-239/240	3.30E-01	2.9E+01		
RA-226	4.61E+00	4.0E+02		
RA-228	3.17E+00	2.8E+02		
SR-90	4.47E+00	3.9E+02		
TH-228	3.81E+00	3.3E+02		
TH-230	3.55E+00	3.1E+02		
TH-232	2.67E+00	2.3E+02		
U-234	3.60E+00	3.1E+02		
U-235/236	1.60E-01	1.4E+01		
U-238	3.61E+00	3.2E+02		

Total Pathway:

Chemical Hazard

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	HQ
Arsenic	9.25E-07	2.5E-08		
Beryllium	4.84E-08	1.3E-09		
Lead	5.71E-07	1.6E-08		
Thallium	2.78E-08	7.6E-10		
TH-TOTAL	2.53E-07	6.9E-09		
2-Methylnaphthalene	5.77E-10	1.6E-11		
Benzo(a)anthracene	1.13E-09	3.1E-11		
Benzo(a)pyrene	1.24E-09	3.4E-11		
Benzo(b)fluoranthene	1.85E-09	5.1E-11		
Phenanthrene	2.16E-09	5.9E-11		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	HQ
Arsenic	8.98E+01	1.2E-05	3.0E-04	4.1E-02
Beryllium	4.67E+00	6.4E-07	5.0E-03	1.3E-04
Lead	5.54E+01	7.6E-06		
Thallium	2.66E+00	3.6E-07	7.0E-05	5.2E-03
TH-TOTAL	2.45E+01	3.4E-06		
2-Methylnaphthalene	5.60E-02	7.7E-09		
Benzo(a)anthracene	1.10E-01	1.5E-08		
Benzo(a)pyrene	1.20E-01	1.6E-08		
Benzo(b)fluoranthene	1.80E-01	2.5E-08		
Phenanthrene	2.10E-01	2.9E-08		

Total Pathway: 4.6E-02

Total Rad + Chem

Total Rad + Chem 4.6E-02

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TABLE B.3.1-11
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	HQ
Not applicable	CS-137	7.3E-01		
	NP-237	4.4E+00		
	PU-238	5.8E-01		
	PU-239/240	2.6E-01		
	RA-226	3.7E+00		
	RA-228	2.5E+00		
	SR-90	3.6E+00		
	TH-228	3.0E+00		
	TH-230	2.8E+00		
	TH-232	2.1E+00		
	U-234	2.9E+00		
	U-235/236	1.3E-01		
	U-238	2.9E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	HQ	Compound	Intake	RfD(o)	HQ	
Arsenic	7.1E-07	2.9E-04	2.5E-03					4.3E-02
Beryllium	3.7E-07	5.0E-05	7.4E-03					7.5E-03
Lead	4.4E-06							
Thallium	2.1E-07	7.0E-05	3.0E-03					8.2E-03
TH-TOTAL				Not applicable				
2-Methylnaphthalene	1.3E-07							
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Phenanthrene	5.0E-07							
	Total Pathway:		1.3E-02		Total Pathway:			
	Total Rad + Chem		1.3E-02		Total Rad + Chem			***Total:*** 5.9E-02

TABLE B.3.1-12(a)

FUTURE OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)

ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.87E-07	8.0E-02	1.9E-11	1.5E-12	1.5E-12
NP-237	4.11E-06	4.8E-01	2.9E-08	1.4E-08	1.4E-08
PU-238	5.24E-07	6.1E-02	3.9E-08	2.4E-09	2.4E-09
PU-239/240	2.47E-07	2.9E-02	3.8E-08	1.1E-09	1.1E-09
RA-226	3.44E-06	4.0E-01	7.0E-09	2.8E-09	2.8E-09
RA-228	2.39E-06	2.8E-01	6.9E-10	1.9E-10	1.9E-10
SR-90	3.37E-06	3.9E-01	6.2E-11	2.4E-11	2.4E-11
TH-228	2.84E-06	3.3E-01	7.8E-08	2.6E-08	2.6E-08
TH-230	2.66E-06	3.1E-01	2.9E-08	8.9E-09	8.9E-09
TH-232	2.02E-06	2.3E-01	1.1E-07	2.6E-08	2.6E-08
U-234	2.69E-06	3.1E-01	2.6E-08	8.1E-09	8.1E-09
U-235/236	1.20E-07	1.4E-02	2.5E-08	3.5E-10	3.5E-10
U-238	2.69E-06	3.1E-01	5.2E-08	1.6E-08	1.6E-08
			Total Pathway:	1.1E-07	

Chemical Risk					
Inhalation/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.72E-08	4.4E-09	1.5E+01	6.5E-08	6.5E-08
Beryllium	3.52E-09	2.3E-10	8.4E+00	1.9E-09	1.9E-09
Lead	4.14E-08	2.7E-09			
Thallium	2.02E-09	1.3E-10			
TH-TOTAL	1.83E-08	1.2E-09			
2-Methylnaphthalene	4.19E-11	2.7E-12			
Benzo(a)anthracene	8.23E-11	5.3E-12	6.1E-01	3.3E-12	3.3E-12
Benzo(a)pyrene	8.98E-11	5.8E-12	6.1E+00	3.6E-11	3.6E-11
Benzo(b)fluoranthene	1.35E-10	8.7E-12	6.1E-01	5.3E-12	5.3E-12
Phenanthrene	1.57E-10	1.0E-11			
			Total Pathway:	6.7E-08	

Total Rad + Chem 1.7E-07 | *Total:* 1.7E-07

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TABLE B.3.1-12(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Inhalation/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	6.87E-07	8.0E-02		
NP-237	4.11E-06	4.8E-01		
PU-238	5.24E-07	6.1E-02		
PU-239/240	2.47E-07	2.9E-02		
RA-226	3.44E-06	4.0E-01		
RA-228	2.39E-06	2.8E-01		
SR-90	3.37E-06	3.9E-01		
TH-228	2.84E-06	3.3E-01		
TH-230	2.66E-06	3.1E-01		
TH-232	2.02E-06	2.3E-01		
U-234	2.69E-06	3.1E-01		
U-235/236	1.20E-07	1.4E-02		
U-238	2.69E-06	3.1E-01		
			Total Pathway:	0.0E+00

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.72E-08	4.4E-09		
Beryllium	3.52E-09	2.3E-10		
Lead	4.14E-08	2.7E-09		
Thallium	2.02E-09	1.3E-10		
TH-TOTAL	1.83E-08	1.2E-09		
2-Methylnaphthalene	4.19E-11	2.7E-12		
Benzo(a)anthracene	8.23E-11	5.3E-12		
Benzo(a)pyrene	8.98E-11	5.8E-12		
Benzo(b)fluoranthene	1.35E-10	8.7E-12		
Phenanthrene	1.57E-10	1.0E-11		
			Total Pathway:	0.0E+00

		Total	
Total Rad + Chem	0.0E+00	*Total:*	0.0E+00

TABLE B.3.1-12 (b)
FUTURE OFF-PROPERTY RESIDENT CHILD (PRIVATE OWNERSHIP)
ACTIVE FLYASH PILE: SURFACE SOIL/AIR
CARCINOGENIC RISK

Radiation Risk					
	Inhalation/Soil				Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.87E-07	1.4E-03	1.9E-11	2.7E-14	2.7E-14
NP-237	4.11E-06	8.6E-03	2.9E-08	2.5E-10	2.5E-10
PU-238	5.24E-07	1.1E-03	3.9E-08	4.3E-11	4.3E-11
PU-239/240	2.47E-07	5.2E-04	3.8E-08	2.0E-11	2.0E-11
RA-226	3.44E-06	7.2E-03	7.0E-09	5.1E-11	5.1E-11
RA-228	2.39E-06	5.0E-03	6.9E-10	3.5E-12	3.5E-12
SR-90	3.37E-06	7.1E-03	6.2E-11	4.4E-13	4.4E-13
TH-228	2.84E-06	6.0E-03	7.8E-08	4.7E-10	4.7E-10
TH-230	2.66E-06	5.6E-03	2.9E-08	1.6E-10	1.6E-10
TH-232	2.02E-06	4.2E-03	1.1E-07	4.7E-10	4.7E-10
U-234	2.69E-06	5.6E-03	2.6E-08	1.5E-10	1.5E-10
U-235/236	1.20E-07	2.5E-04	2.5E-08	6.3E-12	6.3E-12
U-238	2.69E-06	5.6E-03	5.2E-08	2.9E-10	2.9E-10
			Total Pathway:	1.9E-09	

Chemical Risk					
	Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.72E-08	3.7E-10	1.5E+01	5.5E-09	5.5E-09
Beryllium	3.52E-09	1.9E-11	8.4E+00	1.6E-10	1.6E-10
Lead	4.14E-08	2.3E-10			
Thallium	2.02E-09	1.1E-11			
TH-TOTAL	1.83E-08	1.0E-10			
2-Methylnaphthalene	4.19E-11	2.3E-13			
Benzo(a)anthracene	8.23E-11	4.5E-13	6.1E-01	2.8E-13	2.8E-13
Benzo(a)pyrene	8.98E-11	4.9E-13	6.1E+00	3.0E-12	3.0E-12
Benzo(b)fluoranthene	1.35E-10	7.4E-13	6.1E-01	4.5E-13	4.5E-13
Phenanthrene	1.57E-10	8.6E-13			
			Total Pathway:	5.7E-09	

Total Rad + Chem	7.6E-09	*Total:*	7.6E-09

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TABLE B.3.1-12 (b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard					Total
Inhalation/Soil					
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	6.87E-07	1.4E-03			
NP-237	4.11E-06	8.6E-03			
PU-238	5.24E-07	1.1E-03			
PU-239/240	2.47E-07	5.2E-04			
RA-226	3.44E-06	7.2E-03			
RA-228	2.39E-06	5.0E-03			
SR-90	3.37E-06	7.1E-03			
TH-228	2.84E-06	6.0E-03			
TH-230	2.66E-06	5.6E-03			
TH-232	2.02E-06	4.2E-03			
U-234	2.69E-06	5.6E-03			
U-235/236	1.20E-07	2.5E-04			
U-238	2.69E-06	5.6E-03			
			Total Pathway:	0.0E+00	

Chemical Hazard					
Inhalation/Soil					
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard	
Arsenic	6.72E-08	4.3E-09			
Beryllium	3.52E-09	2.3E-10			
Lead	4.14E-08	2.6E-09			
Thallium	2.02E-09	1.3E-10			
TH-TOTAL	1.83E-08	1.2E-09			
2-Methylnaphthalene	4.19E-11	2.7E-12			
Benzo(a)anthracene	8.23E-11	5.3E-12			
Benzo(a)pyrene	8.98E-11	5.7E-12			
Benzo(b)fluoranthene	1.35E-10	8.6E-12			
Phenanthrene	1.57E-10	1.0E-11			
			Total Pathway:	0.0E+00	

Total Rad + Chem 0.0E+00 | *Total:* 0.0E+00

TABLE B.3.1-12(c)

FUTURE OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.87E-07	8.0E-02	1.9E-11	1.5E-12	1.5E-12
NP-237	4.11E-06	4.8E-01	2.9E-08	1.4E-08	1.4E-08
PU-238	5.24E-07	6.1E-02	3.9E-08	2.4E-09	2.4E-09
PU-239/240	2.47E-07	2.9E-02	3.8E-08	1.1E-09	1.1E-09
RA-226	3.44E-06	4.0E-01	7.0E-09	2.8E-09	2.8E-09
RA-228	2.39E-06	2.8E-01	6.9E-10	1.9E-10	1.9E-10
SR-90	3.37E-06	3.9E-01	6.2E-11	2.4E-11	2.4E-11
TH-228	2.84E-06	3.3E-01	7.8E-08	2.6E-08	2.6E-08
TH-230	2.66E-06	3.1E-01	2.9E-08	8.9E-09	8.9E-09
TH-232	2.02E-06	2.3E-01	1.1E-07	2.6E-08	2.6E-08
U-234	2.69E-06	3.1E-01	2.6E-08	8.1E-09	8.1E-09
U-235/236	1.20E-07	1.4E-02	2.5E-08	3.5E-10	3.5E-10
U-238	2.69E-06	3.1E-01	5.2E-08	1.6E-08	1.6E-08
			Total Pathway:	1.1E-07	

Chemical Risk					
Inhalation/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.72E-08	4.4E-09	1.5E+01	6.5E-08	6.5E-08
Beryllium	3.52E-09	2.3E-10	8.4E+00	1.9E-09	1.9E-09
Lead	4.14E-08	2.7E-09			
Thallium	2.02E-09	1.3E-10			
TH-TOTAL	1.83E-08	1.2E-09			
2-Methylnaphthalene	4.19E-11	2.7E-12			
Benzo(a)anthracene	8.23E-11	5.3E-12	6.1E-01	3.3E-12	3.3E-12
Benzo(a)pyrene	8.98E-11	5.8E-12	6.1E+00	3.6E-11	3.6E-11
Benzo(b)fluoranthene	1.35E-10	8.7E-12	6.1E-01	5.3E-12	5.3E-12
Phenanthrene	1.57E-10	1.0E-11			
			Total Pathway:	6.7E-08	

Total Rad + Chem 1.7E-07 *Total:* 1.7E-07

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TABLE B.3.1-12(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	6.87E-07	8.0E-02			
NP-237	4.11E-06	4.8E-01			
PU-238	5.24E-07	6.1E-02			
PU-239/240	2.47E-07	2.9E-02			
RA-226	3.44E-06	4.0E-01			
RA-228	2.39E-06	2.8E-01			
SR-90	3.37E-06	3.9E-01			
TH-228	2.84E-06	3.3E-01			
TH-230	2.66E-06	3.1E-01			
TH-232	2.02E-06	2.3E-01			
U-234	2.69E-06	3.1E-01			
U-235/236	1.20E-07	1.4E-02			
U-238	2.69E-06	3.1E-01			
			Total Pathway:	0.0E+00	

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.72E-08	4.4E-09		
Beryllium	3.52E-09	2.3E-10		
Lead	4.14E-08	2.7E-09		
Thallium	2.02E-09	1.3E-10		
TH-TOTAL	1.83E-08	1.2E-09		
2-Methylnaphthalene	4.19E-11	2.7E-12		
Benzo(a)anthracene	8.23E-11	5.3E-12		
Benzo(a)pyrene	8.98E-11	5.8E-12		
Benzo(b)fluoranthene	1.35E-10	8.7E-12		
Phenanthrene	1.57E-10	1.0E-11		
			Total Pathway:	0.0E+00

Total Rad + Chem 0.0E+00 | *Total:* 0.0E+00

TABLE B.3.1-12 (d)
FUTURE OFF-PROPERTY RESIDENT CHILD (FEDERAL OWNERSHIP)
ACTIVE FLYASH PILE: SURFACE SOIL/AIR
CARCINOGENIC RISK

Radiation Risk					
	Inhalation/Soil				Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.87E-07	1.4E-03	1.9E-11	2.7E-14	2.7E-14
NP-237	4.11E-06	8.6E-03	2.9E-08	2.5E-10	2.5E-10
PU-238	5.24E-07	1.1E-03	3.9E-08	4.3E-11	4.3E-11
PU-239/240	2.47E-07	5.2E-04	3.8E-08	2.0E-11	2.0E-11
RA-226	3.44E-06	7.2E-03	7.0E-09	5.1E-11	5.1E-11
RA-228	2.39E-06	5.0E-03	6.9E-10	3.5E-12	3.5E-12
SR-90	3.37E-06	7.1E-03	6.2E-11	4.4E-13	4.4E-13
TH-228	2.84E-06	6.0E-03	7.8E-08	4.7E-10	4.7E-10
TH-230	2.66E-06	5.6E-03	2.9E-08	1.6E-10	1.6E-10
TH-232	2.02E-06	4.2E-03	1.1E-07	4.7E-10	4.7E-10
U-234	2.69E-06	5.6E-03	2.6E-08	1.5E-10	1.5E-10
U-235/236	1.20E-07	2.5E-04	2.5E-08	6.3E-12	6.3E-12
U-238	2.69E-06	5.6E-03	5.2E-08	2.9E-10	2.9E-10
			Total Pathway:	1.9E-09	

Chemical Risk					
	Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.72E-08	3.7E-10	1.5E+01	5.5E-09	5.5E-09
Beryllium	3.52E-09	1.9E-11	8.4E+00	1.6E-10	1.6E-10
Lead	4.14E-08	2.3E-10			
Thallium	2.02E-09	1.1E-11			
TH-TOTAL	1.83E-08	1.0E-10			
2-Methylnaphthalene	4.19E-11	2.3E-13			
Benzo(a)anthracene	8.23E-11	4.5E-13	6.1E-01	2.8E-13	2.8E-13
Benzo(a)pyrene	8.98E-11	4.9E-13	6.1E+00	3.0E-12	3.0E-12
Benzo(b)fluoranthene	1.35E-10	7.4E-13	6.1E-01	4.5E-13	4.5E-13
Phenanthrene	1.57E-10	8.6E-13			
			Total Pathway:	5.7E-09	

Total Rad + Chem	7.6E-09	*Total:*	7.6E-09

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TABLE B.3.1-12 (d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard					Total
Inhalation/Soil					
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	6.87E-07	1.4E-03			
NP-237	4.11E-06	8.6E-03			
PU-238	5.24E-07	1.1E-03			
PU-239/240	2.47E-07	5.2E-04			
RA-226	3.44E-06	7.2E-03			
RA-228	2.39E-06	5.0E-03			
SR-90	3.37E-06	7.1E-03			
TH-228	2.84E-06	6.0E-03			
TH-230	2.66E-06	5.6E-03			
TH-232	2.02E-06	4.2E-03			
U-234	2.69E-06	5.6E-03			
U-235/236	1.20E-07	2.5E-04			
U-238	2.69E-06	5.6E-03			
			Total Pathway:	0.0E+00	

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.72E-08	4.3E-09		
Beryllium	3.52E-09	2.3E-10		
Lead	4.14E-08	2.6E-09		
Thallium	2.02E-09	1.3E-10		
TH-TOTAL	1.83E-08	1.2E-09		
2-Methylnaphthalene	4.19E-11	2.7E-12		
Benzo(a)anthracene	8.23E-11	5.3E-12		
Benzo(a)pyrene	8.98E-11	5.7E-12		
Benzo(b)fluoranthene	1.35E-10	8.6E-12		
Phenanthrene	1.57E-10	1.0E-11		
			Total Pathway:	0.0E+00

Total Rad + Chem 0.0E+00 *Total:* 0.0E+00

TABLE B.3.1-13(a)

FUTURE OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.55E-03	2.8E+00	2.8E-11	8.0E-11	CS-137	5.43E-04	4.0E+00	2.8E-11	1.1E-10	1.9E-10
NP-237	1.11E-05	2.0E-02	2.2E-10	4.5E-12	NP-237	1.01E-06	7.4E-03	2.2E-10	1.6E-12	6.1E-12
PU-238	1.33E-08	2.4E-05	2.2E-10	5.4E-15	PU-238	2.66E-09	2.0E-05	2.2E-10	4.3E-15	9.7E-15
PU-239/240	6.72E-09	1.2E-05	2.3E-10	2.8E-15	PU-239/240	1.34E-09	9.9E-06	2.3E-10	2.3E-15	5.1E-15
RA-226	6.14E-05	1.1E-01	7.8E-10	8.8E-11	RA-226	1.11E-04	8.1E-01	7.8E-10	6.3E-10	7.2E-10
RA-228	2.71E-05	5.0E-02	1.0E-10	5.0E-12	RA-228	4.91E-05	3.6E-01	1.0E-10	3.6E-11	4.1E-11
SR-90	1.13E-04	2.1E-01	3.6E-11	7.5E-12	SR-90	5.68E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	6.91E-07	1.3E-03	5.5E-11	7.0E-14	TH-228	5.88E-07	4.3E-03	5.5E-11	2.4E-13	3.1E-13
TH-230	3.21E-06	5.9E-03	1.3E-11	7.7E-14	TH-230	2.68E-06	2.0E-02	1.3E-11	2.6E-13	3.3E-13
TH-232	2.45E-06	4.5E-03	1.7E-10	7.6E-13	TH-232	2.04E-06	1.5E-02	1.7E-10	2.5E-12	3.3E-12
U-234	2.32E-05	4.3E-02	1.6E-11	6.8E-13	U-234	6.97E-05	5.1E-01	1.6E-11	8.2E-12	8.9E-12
U-235/236	1.04E-06	1.9E-03	1.6E-11	3.0E-14	U-235/236	3.11E-06	2.3E-02	1.6E-11	3.7E-13	4.0E-13
U-238	2.32E-05	4.3E-02	2.8E-11	1.2E-12	U-238	6.97E-05	5.1E-01	2.8E-11	1.4E-11	1.6E-11
			Total Pathway:	1.9E-10				Total Pathway:	9.6E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.06E-05	2.1E-08	1.75E+00	3.7E-08	Arsenic	6.18E-07	2.5E-09	1.75E+00	4.4E-09	4.2E-08
Beryllium	3.45E-07	3.5E-10	4.30E+00	1.5E-09	Beryllium	3.11E-10	1.3E-12	4.30E+00	5.5E-12	1.5E-09
Lead	8.20E-07	8.4E-10			Lead	6.83E-07	2.8E-09			
Thallium	1.62E-05	1.7E-08			Thallium	8.11E-07	3.3E-09			
TH-TOTAL	2.22E-08	2.3E-11			TH-TOTAL	1.85E-08	7.6E-11			
2-Methylnaphthalene	1.46E-09	1.5E-12			2-Methylnaphthalene	4.63E-10	1.9E-12			
Benzo(a)anthracene	4.59E-08	4.7E-11	7.30E-01	3.4E-11	Benzo(a)anthracene	1.46E-08	6.0E-11	7.30E-01	4.4E-11	7.8E-11
Benzo(a)pyrene	1.33E-07	1.4E-10	7.30E+00	9.9E-10	Benzo(a)pyrene	4.21E-08	1.7E-10	7.30E+00	1.3E-09	2.3E-09
Benzo(b)fluoranthen	2.05E-07	2.1E-10	7.30E-01	1.5E-10	Benzo(b)fluoranthen	6.51E-08	2.7E-10	7.30E-01	2.0E-10	3.5E-10
Phenanthrene	6.47E-09	6.7E-12			Phenanthrene	2.08E-09	8.6E-12			
			Total Pathway:	4.0E-08				Total Pathway:	6.0E-09	
			Total Rad + Chem	4.0E-08				Total Rad + Chem	6.9E-09	*Total:* 4.7E-08

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TABLE B.3.1-13(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	1.5E-03	2.8E+00		
NP-237	1.1E-05	2.0E-02		
PU-238	1.3E-08	2.4E-05		
PU-239/240	6.7E-09	1.2E-05		
RA-226	6.1E-05	1.1E-01		
RA-228	2.7E-05	5.0E-02		
SR-90	1.1E-04	2.1E-01		
TH-228	6.9E-07	1.3E-03		
TH-230	3.2E-06	5.9E-03		
TH-232	2.4E-06	4.5E-03		
U-234	2.3E-05	4.3E-02		
U-235/236	1.0E-06	1.9E-03		
U-238	2.3E-05	4.3E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	5.43E-04	4.0E+00		
NP-237	1.01E-06	7.4E-03		
PU-238	2.66E-09	2.0E-05		
PU-239/240	1.34E-09	9.9E-06		
RA-226	1.11E-04	8.1E-01		
RA-228	4.91E-05	3.6E-01		
SR-90	5.68E-04	4.2E+00		
TH-228	5.88E-07	4.3E-03		
TH-230	2.68E-06	2.0E-02		
TH-232	2.04E-06	1.5E-02		
U-234	6.97E-05	5.1E-01		
U-235/236	3.11E-06	2.3E-02		
U-238	6.97E-05	5.1E-01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.1E-05	2.1E-08	3.0E-04	7.1E-05
Beryllium	3.5E-07	3.5E-10	5.0E-03	7.1E-08
Lead	8.2E-07	8.4E-10		
Thallium	1.6E-05	1.7E-08	7.0E-05	2.4E-04
TH-TOTAL	2.2E-08	2.3E-11		
2-Methylnaphthalene	1.5E-09	1.5E-12		
Benzo(a)anthracene	4.6E-08	4.7E-11		
Benzo(a)pyrene	1.3E-07	1.4E-10		
Benzo(b)fluoranthen	2.0E-07	2.1E-10		
Phenanthrene	6.5E-09	6.7E-12		

Total Pathway: 3.1E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	6.18E-07	2.5E-09	3.0E-04	8.5E-06
Beryllium	3.11E-10	1.3E-12	5.0E-03	2.6E-10
Lead	6.83E-07	2.8E-09		
Thallium	8.11E-07	3.3E-09	7.0E-05	4.8E-05
TH-TOTAL	1.85E-08	7.6E-11		
2-Methylnaphthalene	4.63E-10	1.9E-12		
Benzo(a)anthracene	1.46E-08	6.0E-11		
Benzo(a)pyrene	4.21E-08	1.7E-10		
Benzo(b)fluoranthen	6.51E-08	2.7E-10		
Phenanthrene	2.08E-09	8.6E-12		

Total Pathway: 5.6E-05

	Total
	7.9E-05
	7.1E-08
	2.9E-04

Total Rad + Chem 3.1E-04

Total Rad + Chem 5.6E-05 *Total:* 3.6E-04

TABLE B.3.1-13(a)

(continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.52E-04	8.3E-01	2.2E-10	1.8E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	5.16E-03	9.5E+00	7.8E-10	7.4E-09
RA-228			1.0E-10	
SR-90	5.58E-01	1.0E+03	3.6E-11	3.7E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.05E-03	1.5E+01	1.6E-11	2.4E-10
U-235/236	1.66E-01	3.1E+02	1.6E-11	4.9E-09
U-238			2.8E-11	
			Total Pathway:	5.0E-08

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.24E-05	3.1E-01	2.2E-10	6.8E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	9.52E-03	7.0E+01	7.8E-10	5.5E-08
RA-228			1.0E-10	
SR-90	2.83E+00	2.1E+04	3.6E-11	7.5E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.50E-02	1.8E+02	1.6E-11	2.9E-09
U-235/236	5.16E-01	3.8E+03	1.6E-11	6.1E-08
U-238			2.8E-11	
			Total Pathway:	8.7E-07

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.26E-07	1.3E-10	1.75E+00	2.3E-10
Beryllium	6.49E-10	6.7E-13	4.30E+00	2.9E-12
Lead	7.15E-07	7.3E-10		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthen			7.30E-01	
Phenanthrene				
U-Total	5.95E-04	6.1E-07		
			Total Pathway:	2.3E-10

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	3.82E-09	1.6E-11	1.8E+00	2.7E-11
Beryllium	5.96E-13	2.5E-15	4.3E+00	1.1E-14
Lead	6.10E-07	2.5E-09		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	1.85E-03	7.6E-06		
			Total Pathway:	2.7E-11

Total Rad + Chem 5.0E-08

Total Rad + Chem 8.7E-07

	Total	Total Dust & Groundwate Affected
		1.9E-10
	2.5E-10	2.6E-10
		9.7E-15
		5.1E-15
	6.2E-08	6.3E-08
		4.1E-11
	7.9E-07	7.9E-07
		3.1E-13
		3.3E-13
		3.3E-12
	3.2E-09	3.2E-09
	6.6E-08	6.6E-08
		1.6E-11
	2.5E-10	4.2E-08
	2.9E-12	1.5E-09
		7.8E-11
		2.3E-09
		3.5E-10
Total:	9.2E-07	9.6E-07

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TABLE B.3.1-13(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.5E-04	8.3E-01		
PU-238				
PU-239/240				
RA-226	5.2E-03	9.5E+00		
RA-228				
SR-90	5.6E-01	1.0E+03		
TH-228				
TH-230				
TH-232				
U-234	8.1E-03	1.5E+01		
U-235/236	1.7E-01	3.1E+02		
U-238				

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.24E-05	3.1E-01		
PU-238				
PU-239/240				
RA-226	9.52E-03	7.0E+01		
RA-228				
SR-90	2.83E+00	2.1E+04		
TH-228				
TH-230				
TH-232				
U-234	2.50E-02	1.8E+02		
U-235/236	5.16E-01	3.8E+03		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.3E-07	1.3E-10	3.0E-04	4.3E-07
Beryllium	6.5E-10	6.7E-13	5.0E-03	1.3E-10
Lead	7.1E-07	7.3E-10		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthen				
Phenanthrene				
U-Total	6.0E-04	6.1E-07	3.0E-03	2.0E-04

Total Pathway: 2.0E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	3.82E-09	1.6E-11	3.0E-04	5.2E-08
Beryllium	5.96E-13	2.5E-15	5.0E-03	4.9E-13
Lead	6.10E-07	2.5E-09		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthen				
Phenanthrene				
U-Total	1.85E-03	7.6E-06	3.0E-03	2.5E-03

Total Pathway: 2.5E-03

	Total	Total Dust & Groundwater Affected
	4.8E-07	8.0E-05
	1.3E-10	7.1E-08
		2.9E-04
	2.7E-03	2.7E-03

Total Rad + Chem 2.0E-04

Total Rad + Chem 2.5E-03 *Total:* 2.7E-03 3.1E-03

TABLE B.3.1-13(b)

FUTURE OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.55E-03	9.4E-02	2.8E-11	2.6E-12	CS-137	5.43E-04	7.8E-01	2.8E-11	2.2E-11	2.4E-11
NP-237	1.11E-05	6.8E-04	2.2E-10	1.5E-13	NP-237	1.01E-06	1.4E-03	2.2E-10	3.2E-13	4.7E-13
PU-238	1.33E-08	8.1E-07	2.2E-10	1.8E-16	PU-238	2.66E-09	3.8E-06	2.2E-10	8.4E-16	1.0E-15
PU-239/240	6.72E-09	4.1E-07	2.3E-10	9.4E-17	PU-239/240	1.34E-09	1.9E-06	2.3E-10	4.4E-16	5.4E-16
RA-226	6.14E-05	3.7E-03	7.8E-10	2.9E-12	RA-226	1.11E-04	1.6E-01	7.8E-10	1.2E-10	1.3E-10
RA-228	2.71E-05	1.6E-03	1.0E-10	1.6E-13	RA-228	4.91E-05	7.0E-02	1.0E-10	7.0E-12	7.2E-12
SR-90	1.13E-04	6.9E-03	3.6E-11	2.5E-13	SR-90	5.68E-04	8.1E-01	3.6E-11	2.9E-11	2.9E-11
TH-228	6.91E-07	4.2E-05	5.5E-11	2.3E-15	TH-228	5.88E-07	8.4E-04	5.5E-11	4.6E-14	4.8E-14
TH-230	3.21E-06	2.0E-04	1.3E-11	2.5E-15	TH-230	2.68E-06	3.8E-03	1.3E-11	5.0E-14	5.2E-14
TH-232	2.45E-06	1.5E-04	1.7E-10	2.5E-14	TH-232	2.04E-06	2.9E-03	1.7E-10	4.9E-13	5.2E-13
U-234	2.32E-05	1.4E-03	1.6E-11	2.3E-14	U-234	6.97E-05	1.0E-01	1.6E-11	1.6E-12	1.6E-12
U-235/236	1.04E-06	6.3E-05	1.6E-11	1.0E-15	U-235/236	3.11E-06	4.4E-03	1.6E-11	7.1E-14	7.2E-14
U-238	2.32E-05	1.4E-03	2.8E-11	4.0E-14	U-238	6.97E-05	1.0E-01	2.8E-11	2.8E-12	2.8E-12
			Total Pathway:	6.2E-12				Total Pathway:	1.9E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.06E-05	3.3E-09	1.8E+00	5.7E-09	Arsenic	6.18E-07	2.3E-09	1.8E+00	4.0E-09	9.8E-09
Beryllium	3.45E-07	5.5E-11	4.3E+00	2.4E-10	Beryllium	3.11E-10	1.2E-12	4.3E+00	5.0E-12	2.4E-10
Lead	8.20E-07	1.3E-10			Lead	6.83E-07	2.5E-09			
Thallium	1.62E-05	2.6E-09			Thallium	8.11E-07	3.0E-09			
TH-TOTAL	2.22E-08	3.5E-12			TH-TOTAL	1.85E-08	6.9E-11			
2-Methylnaphthalene	1.46E-09	2.3E-13			2-Methylnaphthalene	4.63E-10	1.7E-12			
Benzo(a)anthracene	4.59E-08	7.3E-12	7.3E-01	5.3E-12	Benzo(a)anthracene	1.46E-08	5.4E-11	7.3E-01	4.0E-11	4.5E-11
Benzo(a)pyrene	1.33E-07	2.1E-11	7.3E+00	1.5E-10	Benzo(a)pyrene	4.21E-08	1.6E-10	7.3E+00	1.1E-09	1.3E-09
Benzo(b)fluoranthen	2.05E-07	3.3E-11	7.3E-01	2.4E-11	Benzo(b)fluoranthen	6.51E-08	2.4E-10	7.3E-01	1.8E-10	2.0E-10
Phenanthrene	6.47E-09	1.0E-12			Phenanthrene	2.08E-09	7.8E-12			
			Total Pathway:	6.2E-09				Total Pathway:	5.4E-09	

Total Rad + Chem 6.2E-09

Total Rad + Chem 5.6E-09 *Total:* 1.2E-08

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FEMP-OU02-6 FINAL
January 21, 1995

TABLE B.3.1-13(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.5E-03	9.4E-02			CS-137	5.43E-04	7.8E-01			
NP-237	1.1E-05	6.8E-04			NP-237	1.01E-06	1.4E-03			
PU-238	1.3E-08	8.1E-07			PU-238	2.66E-09	3.8E-06			
PU-239/240	6.7E-09	4.1E-07			PU-239/240	1.34E-09	1.9E-06			
RA-226	6.1E-05	3.7E-03			RA-226	1.11E-04	1.6E-01			
RA-228	2.7E-05	1.6E-03			RA-228	4.91E-05	7.0E-02			
SR-90	1.1E-04	6.9E-03			SR-90	5.68E-04	8.1E-01			
TH-228	6.9E-07	4.2E-05			TH-228	5.88E-07	8.4E-04			
TH-230	3.2E-06	2.0E-04			TH-230	2.68E-06	3.8E-03			
TH-232	2.4E-06	1.5E-04			TH-232	2.04E-06	2.9E-03			
U-234	2.3E-05	1.4E-03			U-234	6.97E-05	1.0E-01			
U-235/236	1.0E-06	6.3E-05			U-235/236	3.11E-06	4.4E-03			
U-238	2.3E-05	1.4E-03			U-238	6.97E-05	1.0E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-05	3.8E-08	3.0E-04	1.3E-04	Arsenic	6.18E-07	2.7E-08	3.0E-04	9.0E-05	2.2E-04
Beryllium	3.5E-07	6.4E-10	5.0E-03	1.3E-07	Beryllium	3.11E-10	1.4E-11	5.0E-03	2.7E-09	1.3E-07
Lead	8.2E-07	1.5E-09			Lead	6.83E-07	3.0E-08			
Thallium	1.6E-05	3.0E-08	7.0E-05	4.3E-04	Thallium	8.11E-07	3.5E-08	7.0E-05	5.0E-04	9.3E-04
TH-TOTAL	2.2E-08	4.1E-11			TH-TOTAL	1.85E-08	8.0E-10			
2-Methylnaphthalene	1.5E-09	2.7E-12			2-Methylnaphthalene	4.63E-10	2.0E-11			
Benzo(a)anthracene	4.6E-08	8.5E-11			Benzo(a)anthracene	1.46E-08	6.3E-10			
Benzo(a)pyrene	1.3E-07	2.5E-10			Benzo(a)pyrene	4.21E-08	1.8E-09			
Benzo(b)fluoranthen	2.0E-07	3.8E-10			Benzo(b)fluoranthen	6.51E-08	2.8E-09			
Phenanthrene	6.5E-09	1.2E-11			Phenanthrene	2.08E-09	9.1E-11			
		Total Pathway:		5.6E-04			Total Pathway:		5.9E-04	

Total Rad + Chem 5.6E-04

Total Rad + Chem 5.9E-04 *Total:* 1.2E-03

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TABLE B.3.1-13(b)

(continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwate Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			2.4E-11
NP-237	4.52E-04	2.8E-02	2.2E-10	6.1E-12	NP-237	4.24E-05	6.0E-02	2.2E-10	1.3E-11	1.9E-11	2.0E-11
PU-238			2.2E-10		PU-238			2.2E-10			1.0E-15
PU-239/240			2.3E-10		PU-239/240			2.3E-10			5.4E-16
RA-226	5.16E-03	3.1E-01	7.8E-10	2.5E-10	RA-226	9.52E-03	1.4E+01	7.8E-10	1.1E-08	1.1E-08	1.1E-08
RA-228			1.0E-10		RA-228			1.0E-10			7.2E-12
SR-90	5.58E-01	3.4E+01	3.6E-11	1.2E-09	SR-90	2.83E+00	4.0E+03	3.6E-11	1.5E-07	1.5E-07	1.5E-07
TH-228			5.5E-11		TH-228			5.5E-11			4.8E-14
TH-230			1.3E-11		TH-230			1.3E-11			5.2E-14
TH-232			1.7E-10		TH-232			1.7E-10			5.2E-13
U-234	8.05E-03	4.9E-01	1.6E-11	7.8E-12	U-234	2.50E-02	3.6E+01	1.6E-11	5.7E-10	5.8E-10	5.8E-10
U-235/236	1.66E-01	1.0E+01	1.6E-11	1.6E-10	U-235/236	5.16E-01	7.4E+02	1.6E-11	1.2E-08	1.2E-08	1.2E-08
U-238			2.8E-11		U-238			2.8E-11			2.8E-12
			Total Pathway:	1.6E-09				Total Pathway:	1.7E-07		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk		
Arsenic	1.26E-07	2.0E-11	1.75E+00	3.5E-11	Arsenic	3.82E-09	1.4E-11	1.75E+00	2.5E-11	6.0E-11	9.8E-09
Beryllium	6.49E-10	1.0E-13	4.30E+00	4.4E-13	Beryllium	5.96E-13	2.2E-15	4.30E+00	9.6E-15	4.5E-13	2.4E-10
Lead	7.15E-07	1.1E-10			Lead	6.10E-07	2.3E-09				
Thallium					Thallium						
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene			7.30E-01		Benzo(a)anthracene			7.30E-01			4.5E-11
Benzo(a)pyrene			7.30E+00		Benzo(a)pyrene			7.30E+00			1.3E-09
Benzo(b)fluoranthen			7.30E-01		Benzo(b)fluoranthen			7.30E-01			2.0E-10
Phenanthrene					Phenanthrene						
U-Total	5.95E-04	9.5E-08			U-Total	1.85E-03	6.9E-06				
			Total Pathway:	3.5E-11				Total Pathway:	2.5E-11		
			Total Rad + Chem	1.7E-09				Total Rad + Chem	1.7E-07	*Total:* 1.7E-07	1.8E-07

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TABLE B.3.1-13(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef				
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.5E-04	2.8E-02		
PU-238				
PU-239/240				
RA-226	5.2E-03	3.1E-01		
RA-228				
SR-90	5.6E-01	3.4E+01		
TH-228				
TH-230				
TH-232				
U-234	8.1E-03	4.9E-01		
U-235/236	1.7E-01	1.0E+01		
U-238				
			Total Pathway:	

Ingestion/Milk				
Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.24E-05	6.0E-02		
PU-238				
PU-239/240				
RA-226	9.52E-03	1.4E+01		
RA-228				
SR-90	2.83E+00	4.0E+03		
TH-228				
TH-230				
TH-232				
U-234	2.50E-02	3.6E+01		
U-235/236	5.16E-01	7.4E+02		
U-238				
			Total Pathway:	

Chemical Hazard

Ingestion/Beef				
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.3E-07	2.3E-10	3.0E-04	7.8E-07
Beryllium	6.5E-10	1.2E-12	5.0E-03	2.4E-10
Lead	7.1E-07	1.3E-09		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	6.0E-04	1.1E-06	3.0E-03	3.7E-04
			Total Pathway:	3.7E-04
			Total Rad + Chem	3.7E-04

Ingestion/Milk						Total Dust & Groundwater
Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	Total	Affected
Arsenic	3.82E-09	1.7E-10	3.0E-04	5.5E-07	1.3E-06	2.2E-04
Beryllium	5.96E-13	2.6E-14	5.0E-03	5.2E-12	2.5E-10	1.3E-07
Lead	6.10E-07	2.7E-08				
Thallium			7.0E-05			9.3E-04
TH-TOTAL						
2-Methylnaphthalene						
Benzo(a)anthracene						
Benzo(a)pyrene						
Benzo(b)fluoranthen						
Phenanthrene						
U-Total	1.85E-03	8.0E-05	3.0E-03	2.7E-02	2.7E-02	2.7E-02
			Total Pathway:	2.7E-02		
			Total Rad + Chem	2.7E-02	*Total:* 2.7E-02	2.8E-02

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TABLE B.3.1-13(c)

FUTURE OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.55E-03	2.8E+00	2.8E-11	8.0E-11	CS-137	5.43E-04	4.0E+00	2.8E-11	1.1E-10	1.9E-10
NP-237	1.11E-05	2.0E-02	2.2E-10	4.5E-12	NP-237	1.01E-06	7.4E-03	2.2E-10	1.6E-12	6.1E-12
PU-238	1.33E-08	2.4E-05	2.2E-10	5.4E-15	PU-238	2.66E-09	2.0E-05	2.2E-10	4.3E-15	9.7E-15
PU-239/240	6.72E-09	1.2E-05	2.3E-10	2.8E-15	PU-239/240	1.34E-09	9.9E-06	2.3E-10	2.3E-15	5.1E-15
RA-226	6.14E-05	1.1E-01	7.8E-10	8.8E-11	RA-226	1.11E-04	8.1E-01	7.8E-10	6.3E-10	7.2E-10
RA-228	2.71E-05	5.0E-02	1.0E-10	5.0E-12	RA-228	4.91E-05	3.6E-01	1.0E-10	3.6E-11	4.1E-11
SR-90	1.13E-04	2.1E-01	3.6E-11	7.5E-12	SR-90	5.68E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	6.91E-07	1.3E-03	5.5E-11	7.0E-14	TH-228	5.88E-07	4.3E-03	5.5E-11	2.4E-13	3.1E-13
TH-230	3.21E-06	5.9E-03	1.3E-11	7.7E-14	TH-230	2.68E-06	2.0E-02	1.3E-11	2.6E-13	3.3E-13
TH-232	2.45E-06	4.5E-03	1.7E-10	7.6E-13	TH-232	2.04E-06	1.5E-02	1.7E-10	2.5E-12	3.3E-12
U-234	2.32E-05	4.3E-02	1.6E-11	6.8E-13	U-234	6.97E-05	5.1E-01	1.6E-11	8.2E-12	8.9E-12
U-235/236	1.04E-06	1.9E-03	1.6E-11	3.0E-14	U-235/236	3.11E-06	2.3E-02	1.6E-11	3.7E-13	4.0E-13
U-238	2.32E-05	4.3E-02	2.8E-11	1.2E-12	U-238	6.97E-05	5.1E-01	2.8E-11	1.4E-11	1.6E-11
			Total Pathway:	1.9E-10				Total Pathway:	9.6E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.06E-05	2.1E-08	1.75E+00	3.7E-08	Arsenic	6.18E-07	2.5E-09	1.75E+00	4.4E-09	4.2E-08
Beryllium	3.45E-07	3.5E-10	4.30E+00	1.5E-09	Beryllium	3.11E-10	1.3E-12	4.30E+00	5.5E-12	1.5E-09
Lead	8.20E-07	8.4E-10			Lead	6.83E-07	2.8E-09			
Thallium	1.62E-05	1.7E-08			Thallium	8.11E-07	3.3E-09			
TH-TOTAL	2.22E-08	2.3E-11			TH-TOTAL	1.85E-08	7.6E-11			
2-Methylnaphthalene	1.46E-09	1.5E-12			2-Methylnaphthalene	4.63E-10	1.9E-12			
Benzo(a)anthracene	4.59E-08	4.7E-11	7.30E-01	3.4E-11	Benzo(a)anthracene	1.46E-08	6.0E-11	7.30E-01	4.4E-11	7.8E-11
Benzo(a)pyrene	1.33E-07	1.4E-10	7.30E+00	9.9E-10	Benzo(a)pyrene	4.21E-08	1.7E-10	7.30E+00	1.3E-09	2.3E-09
Benzo(b)fluoranthen	2.05E-07	2.1E-10	7.30E-01	1.5E-10	Benzo(b)fluoranthen	6.51E-08	2.7E-10	7.30E-01	2.0E-10	3.5E-10
Phenanthrene	6.47E-09	6.7E-12			Phenanthrene	2.08E-09	8.6E-12			
			Total Pathway:	4.0E-08				Total Pathway:	6.0E-09	
			Total Rad + Chem	4.0E-08				Total Rad + Chem	6.9E-09	*Total:* 4.7E-08

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TABLE B.3.1-13(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.5E-03	2.8E+00			CS-137	5.43E-04	4.0E+00			
NP-237	1.1E-05	2.0E-02			NP-237	1.01E-06	7.4E-03			
PU-238	1.3E-08	2.4E-05			PU-238	2.66E-09	2.0E-05			
PU-239/240	6.7E-09	1.2E-05			PU-239/240	1.34E-09	9.9E-06			
RA-226	6.1E-05	1.1E-01			RA-226	1.11E-04	8.1E-01			
RA-228	2.7E-05	5.0E-02			RA-228	4.91E-05	3.6E-01			
SR-90	1.1E-04	2.1E-01			SR-90	5.68E-04	4.2E+00			
TH-228	6.9E-07	1.3E-03			TH-228	5.88E-07	4.3E-03			
TH-230	3.2E-06	5.9E-03			TH-230	2.68E-06	2.0E-02			
TH-232	2.4E-06	4.5E-03			TH-232	2.04E-06	1.5E-02			
U-234	2.3E-05	4.3E-02			U-234	6.97E-05	5.1E-01			
U-235/236	1.0E-06	1.9E-03			U-235/236	3.11E-06	2.3E-02			
U-238	2.3E-05	4.3E-02			U-238	6.97E-05	5.1E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-05	2.1E-08	3.0E-04	7.1E-05	Arsenic	6.18E-07	2.5E-09	3.0E-04	8.5E-06	7.9E-05
Beryllium	3.5E-07	3.5E-10	5.0E-03	7.1E-08	Beryllium	3.11E-10	1.3E-12	5.0E-03	2.6E-10	7.1E-08
Lead	8.2E-07	8.4E-10			Lead	6.83E-07	2.8E-09			
Thallium	1.6E-05	1.7E-08	7.0E-05	2.4E-04	Thallium	8.11E-07	3.3E-09	7.0E-05	4.8E-05	2.9E-04
TH-TOTAL	2.2E-08	2.3E-11			TH-TOTAL	1.85E-08	7.6E-11			
2-Methylnaphthalene	1.5E-09	1.5E-12			2-Methylnaphthalene	4.63E-10	1.9E-12			
Benzo(a)anthracene	4.6E-08	4.7E-11			Benzo(a)anthracene	1.46E-08	6.0E-11			
Benzo(a)pyrene	1.3E-07	1.4E-10			Benzo(a)pyrene	4.21E-08	1.7E-10			
Benzo(b)fluoranthen	2.0E-07	2.1E-10			Benzo(b)fluoranthen	6.51E-08	2.7E-10			
Phenanthrene	6.5E-09	6.7E-12			Phenanthrene	2.08E-09	8.6E-12			
		Total Pathway:		3.1E-04			Total Pathway:		5.6E-05	

Total Rad + Chem 3.1E-04

Total Rad + Chem 5.6E-05 *Total:* 3.6E-04

TABLE B.3.1-13(c)

(continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.52E-04	8.3E-01	2.2E-10	1.8E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	5.16E-03	9.5E+00	7.8E-10	7.4E-09
RA-228			1.0E-10	
SR-90	5.58E-01	1.0E+03	3.6E-11	3.7E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.05E-03	1.5E+01	1.6E-11	2.4E-10
U-235/236	1.66E-01	3.1E+02	1.6E-11	4.9E-09
U-238			2.8E-11	
		Total Pathway:		5.0E-08

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.24E-05	3.1E-01	2.2E-10	6.8E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	9.52E-03	7.0E+01	7.8E-10	5.5E-08
RA-228			1.0E-10	
SR-90	2.83E+00	2.1E+04	3.6E-11	7.5E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.50E-02	1.8E+02	1.6E-11	2.9E-09
U-235/236	5.16E-01	3.8E+03	1.6E-11	6.1E-08
U-238			2.8E-11	
		Total Pathway:		8.7E-07

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.26E-07	1.3E-10	1.75E+00	2.3E-10
Beryllium	6.49E-10	6.7E-13	4.30E+00	2.9E-12
Lead	7.15E-07	7.3E-10		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthen			7.30E-01	
Phenanthrene				
U-Total	5.95E-04	6.1E-07		
		Total Pathway:		2.3E-10
		Total Rad + Chem		5.0E-08

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	3.82E-09	1.6E-11	1.8E+00	2.7E-11
Beryllium	5.96E-13	2.5E-15	4.3E+00	1.1E-14
Lead	6.10E-07	2.5E-09		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	1.85E-03	7.6E-06		
		Total Pathway:		2.7E-11
		Total Rad + Chem		8.7E-07

	Total	Total Dust & Groundwate Affected
		1.9E-10
	2.5E-10	2.6E-10
		9.7E-15
		5.1E-15
	6.2E-08	6.3E-08
		4.1E-11
	7.9E-07	7.9E-07
		3.1E-13
		3.3E-13
		3.3E-12
	3.2E-09	3.2E-09
	6.6E-08	6.6E-08
		1.6E-11
		4.2E-08
	2.9E-12	1.5E-09
		7.8E-11
		2.3E-09
		3.5E-10
Total:	9.2E-07	9.6E-07

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TABLE B.3.1-13(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.5E-04	8.3E-01		
PU-238				
PU-239/240				
RA-226	5.2E-03	9.5E+00		
RA-228				
SR-90	5.6E-01	1.0E+03		
TH-228				
TH-230				
TH-232				
U-234	8.1E-03	1.5E+01		
U-235/236	1.7E-01	3.1E+02		
U-238				

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.24E-05	3.1E-01		
PU-238				
PU-239/240				
RA-226	9.52E-03	7.0E+01		
RA-228				
SR-90	2.83E+00	2.1E+04		
TH-228				
TH-230				
TH-232				
U-234	2.50E-02	1.8E+02		
U-235/236	5.16E-01	3.8E+03		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.3E-07	1.3E-10	3.0E-04	4.3E-07
Beryllium	6.5E-10	6.7E-13	5.0E-03	1.3E-10
Lead	7.1E-07	7.3E-10		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthen				
Phenanthrene				
U-Total	6.0E-04	6.1E-07	3.0E-03	2.0E-04

Total Pathway: 2.0E-04

Total Rad + Chem 2.0E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	3.82E-09	1.6E-11	3.0E-04	5.2E-08
Beryllium	5.96E-13	2.5E-15	5.0E-03	4.9E-13
Lead	6.10E-07	2.5E-09		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthen				
Phenanthrene				
U-Total	1.85E-03	7.6E-06	3.0E-03	2.5E-03

Total Pathway: 2.5E-03

Total Rad + Chem 2.5E-03

	Total	Total Dust & Groundwater Affected
	4.8E-07	8.0E-05
	1.3E-10	7.1E-08
		2.9E-04
	2.7E-03	2.7E-03
Total:	2.7E-03	3.1E-03

TABLE B.3.1-13(d)

FUTURE OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.55E-03	9.4E-02	2.8E-11	2.6E-12	CS-137	5.43E-04	7.8E-01	2.8E-11	2.2E-11	2.4E-11
NP-237	1.11E-05	6.8E-04	2.2E-10	1.5E-13	NP-237	1.01E-06	1.4E-03	2.2E-10	3.2E-13	4.7E-13
PU-238	1.33E-08	8.1E-07	2.2E-10	1.8E-16	PU-238	2.66E-09	3.8E-06	2.2E-10	8.4E-16	1.0E-15
PU-239/240	6.72E-09	4.1E-07	2.3E-10	9.4E-17	PU-239/240	1.34E-09	1.9E-06	2.3E-10	4.4E-16	5.4E-16
RA-226	6.14E-05	3.7E-03	7.8E-10	2.9E-12	RA-226	1.11E-04	1.6E-01	7.8E-10	1.2E-10	1.3E-10
RA-228	2.71E-05	1.6E-03	1.0E-10	1.6E-13	RA-228	4.91E-05	7.0E-02	1.0E-10	7.0E-12	7.2E-12
SR-90	1.13E-04	6.9E-03	3.6E-11	2.5E-13	SR-90	5.68E-04	8.1E-01	3.6E-11	2.9E-11	2.9E-11
TH-228	6.91E-07	4.2E-05	5.5E-11	2.3E-15	TH-228	5.88E-07	8.4E-04	5.5E-11	4.6E-14	4.8E-14
TH-230	3.21E-06	2.0E-04	1.3E-11	2.5E-15	TH-230	2.68E-06	3.8E-03	1.3E-11	5.0E-14	5.2E-14
TH-232	2.45E-06	1.5E-04	1.7E-10	2.5E-14	TH-232	2.04E-06	2.9E-03	1.7E-10	4.9E-13	5.2E-13
U-234	2.32E-05	1.4E-03	1.6E-11	2.3E-14	U-234	6.97E-05	1.0E-01	1.6E-11	1.6E-12	1.6E-12
U-235/236	1.04E-06	6.3E-05	1.6E-11	1.0E-15	U-235/236	3.11E-06	4.4E-03	1.6E-11	7.1E-14	7.2E-14
U-238	2.32E-05	1.4E-03	2.8E-11	4.0E-14	U-238	6.97E-05	1.0E-01	2.8E-11	2.8E-12	2.8E-12
			Total Pathway:	6.2E-12				Total Pathway:	1.9E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.06E-05	3.3E-09	1.8E+00	5.7E-09	Arsenic	6.18E-07	2.3E-09	1.8E+00	4.0E-09	9.8E-09
Beryllium	3.45E-07	5.5E-11	4.3E+00	2.4E-10	Beryllium	3.11E-10	1.2E-12	4.3E+00	5.0E-12	2.4E-10
Lead	8.20E-07	1.3E-10			Lead	6.83E-07	2.5E-09			
Thallium	1.62E-05	2.6E-09			Thallium	8.11E-07	3.0E-09			
TH-TOTAL	2.22E-08	3.5E-12			TH-TOTAL	1.85E-08	6.9E-11			
2-Methylnaphthalene	1.46E-09	2.3E-13			2-Methylnaphthalene	4.63E-10	1.7E-12			
Benzo(a)anthracene	4.59E-08	7.3E-12	7.3E-01	5.3E-12	Benzo(a)anthracene	1.46E-08	5.4E-11	7.3E-01	4.0E-11	4.5E-11
Benzo(a)pyrene	1.33E-07	2.1E-11	7.3E+00	1.5E-10	Benzo(a)pyrene	4.21E-08	1.6E-10	7.3E+00	1.1E-09	1.3E-09
Benzo(b)fluoranthen	2.05E-07	3.3E-11	7.3E-01	2.4E-11	Benzo(b)fluoranthen	6.51E-08	2.4E-10	7.3E-01	1.8E-10	2.0E-10
Phenanthrene	6.47E-09	1.0E-12			Phenanthrene	2.08E-09	7.8E-12			
			Total Pathway:	6.2E-09				Total Pathway:	5.4E-09	
			Total Rad + Chem	6.2E-09				Total Rad + Chem	5.6E-09	*Total:* 1.2E-08

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TABLE B.3.1-13(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.5E-03	9.4E-02			CS-137	5.43E-04	7.8E-01			
NP-237	1.1E-05	6.8E-04			NP-237	1.01E-06	1.4E-03			
PU-238	1.3E-08	8.1E-07			PU-238	2.66E-09	3.8E-06			
PU-239/240	6.7E-09	4.1E-07			PU-239/240	1.34E-09	1.9E-06			
RA-226	6.1E-05	3.7E-03			RA-226	1.11E-04	1.6E-01			
RA-228	2.7E-05	1.6E-03			RA-228	4.91E-05	7.0E-02			
SR-90	1.1E-04	6.9E-03			SR-90	5.68E-04	8.1E-01			
TH-228	6.9E-07	4.2E-05			TH-228	5.88E-07	8.4E-04			
TH-230	3.2E-06	2.0E-04			TH-230	2.68E-06	3.8E-03			
TH-232	2.4E-06	1.5E-04			TH-232	2.04E-06	2.9E-03			
U-234	2.3E-05	1.4E-03			U-234	6.97E-05	1.0E-01			
U-235/236	1.0E-06	6.3E-05			U-235/236	3.11E-06	4.4E-03			
U-238	2.3E-05	1.4E-03			U-238	6.97E-05	1.0E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-05	3.8E-08	3.0E-04	1.3E-04	Arsenic	6.18E-07	2.7E-08	3.0E-04	9.0E-05	2.2E-04
Beryllium	3.5E-07	6.4E-10	5.0E-03	1.3E-07	Beryllium	3.11E-10	1.4E-11	5.0E-03	2.7E-09	1.3E-07
Lead	8.2E-07	1.5E-09			Lead	6.83E-07	3.0E-08			
Thallium	1.6E-05	3.0E-08	7.0E-05	4.3E-04	Thallium	8.11E-07	3.5E-08	7.0E-05	5.0E-04	9.3E-04
TH-TOTAL	2.2E-08	4.1E-11			TH-TOTAL	1.85E-08	8.0E-10			
2-Methylnaphthalene	1.5E-09	2.7E-12			2-Methylnaphthalene	4.63E-10	2.0E-11			
Benzo(a)anthracene	4.6E-08	8.5E-11			Benzo(a)anthracene	1.46E-08	6.3E-10			
Benzo(a)pyrene	1.3E-07	2.5E-10			Benzo(a)pyrene	4.21E-08	1.8E-09			
Benzo(b)fluoranthen	2.0E-07	3.8E-10			Benzo(b)fluoranthen	6.51E-08	2.8E-09			
Phenanthrene	6.5E-09	1.2E-11			Phenanthrene	2.08E-09	9.1E-11			
		Total Pathway:		5.6E-04			Total Pathway:		5.9E-04	

Total Rad + Chem 5.6E-04

Total Rad + Chem 5.9E-04 *Total:* 1.2E-03

TABLE B.3.1-13(d)

(continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.52E-04	2.8E-02	2.2E-10	6.1E-12
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	5.16E-03	3.1E-01	7.8E-10	2.5E-10
RA-228			1.0E-10	
SR-90	5.58E-01	3.4E+01	3.6E-11	1.2E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.05E-03	4.9E-01	1.6E-11	7.8E-12
U-235/236	1.66E-01	1.0E+01	1.6E-11	1.6E-10
U-238			2.8E-11	
			Total Pathway:	1.6E-09

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.24E-05	6.0E-02	2.2E-10	1.3E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	9.52E-03	1.4E+01	7.8E-10	1.1E-08
RA-228			1.0E-10	
SR-90	2.83E+00	4.0E+03	3.6E-11	1.5E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.50E-02	3.6E+01	1.6E-11	5.7E-10
U-235/236	5.16E-01	7.4E+02	1.6E-11	1.2E-08
U-238			2.8E-11	
			Total Pathway:	1.7E-07

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.26E-07	2.0E-11	1.75E+00	3.5E-11
Beryllium	6.49E-10	1.0E-13	4.30E+00	4.4E-13
Lead	7.15E-07	1.1E-10		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthen			7.30E-01	
Phenanthrene				
U-Total	5.95E-04	9.5E-08		
			Total Pathway:	3.5E-11

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	3.82E-09	1.4E-11	1.75E+00	2.5E-11
Beryllium	5.96E-13	2.2E-15	4.30E+00	9.6E-15
Lead	6.10E-07	2.3E-09		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthen			7.30E-01	
Phenanthrene				
U-Total	1.85E-03	6.9E-06		
			Total Pathway:	2.5E-11

Total Rad + Chem 1.7E-09

Total Rad + Chem 1.7E-07

	Total	Total Dust & Groundwate Affected
		2.4E-11
	1.9E-11	2.0E-11
		1.0E-15
		5.4E-16
	1.1E-08	1.1E-08
		7.2E-12
	1.5E-07	1.5E-07
		4.8E-14
		5.2E-14
		5.2E-13
	5.8E-10	5.8E-10
	1.2E-08	1.2E-08
		2.8E-12
	6.0E-11	9.8E-09
	4.5E-13	2.4E-10
		4.5E-11
		1.3E-09
		2.0E-10
Total:	1.7E-07	1.8E-07

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TABLE B.3.1-13(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk						Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	Total	Dust & Groundwater Affected
CS-137					CS-137						
NP-237	4.5E-04	2.8E-02			NP-237	4.24E-05	6.0E-02				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226	5.2E-03	3.1E-01			RA-226	9.52E-03	1.4E+01				
RA-228					RA-228						
SR-90	5.6E-01	3.4E+01			SR-90	2.83E+00	4.0E+03				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	8.1E-03	4.9E-01			U-234	2.50E-02	3.6E+01				
U-235/236	1.7E-01	1.0E+01			U-235/236	5.16E-01	7.4E+02				
U-238					U-238						
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Beef					Ingestion/Milk						Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	Total	Dust & Groundwater Affected
Arsenic	1.3E-07	2.3E-10	3.0E-04	7.8E-07	Arsenic	3.82E-09	1.7E-10	3.0E-04	5.5E-07	1.3E-06	2.2E-04
Beryllium	6.5E-10	1.2E-12	5.0E-03	2.4E-10	Beryllium	5.96E-13	2.6E-14	5.0E-03	5.2E-12	2.5E-10	1.3E-07
Lead	7.1E-07	1.3E-09			Lead	6.10E-07	2.7E-08				
Thallium			7.0E-05		Thallium			7.0E-05			9.3E-04
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthen						
Phenanthrene					Phenanthrene						
U-Total	6.0E-04	1.1E-06	3.0E-03	3.7E-04	U-Total	1.85E-03	8.0E-05	3.0E-03	2.7E-02	2.7E-02	2.7E-02
		Total Pathway:		3.7E-04			Total Pathway:		2.7E-02		
		Total Rad + Chem		3.7E-04			Total Rad + Chem		2.7E-02	*Total:* 2.7E-02	2.8E-02

TABLE B.3.1-14 (a)

FUTURE OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.74E-07	9.3E-01	2.8E-11	2.6E-11	CS-137	4.73E-07	4.9E-01	2.8E-11	1.4E-11	4.0E-11
NP-237	2.03E-06	4.0E+00	2.2E-10	8.8E-10	NP-237	2.03E-06	2.1E+00	2.2E-10	4.7E-10	1.3E-09
PU-238	2.57E-07	5.1E-01	2.2E-10	1.1E-10	PU-238	2.56E-07	2.7E-01	2.2E-10	5.9E-11	1.7E-10
PU-239/240	1.21E-07	2.4E-01	2.3E-10	5.5E-11	PU-239/240	1.21E-07	1.3E-01	2.3E-10	2.9E-11	8.4E-11
RA-226	1.73E-06	3.4E+00	7.8E-10	2.7E-09	RA-226	1.73E-06	1.8E+00	7.8E-10	1.4E-09	4.1E-09
RA-228	1.17E-06	2.3E+00	1.0E-10	2.3E-10	RA-228	1.16E-06	1.2E+00	1.0E-10	1.2E-10	3.5E-10
SR-90	1.85E-06	3.6E+00	3.6E-11	1.3E-10	SR-90	1.85E-06	1.9E+00	3.6E-11	6.9E-11	2.0E-10
TH-228	1.39E-06	2.7E+00	5.5E-11	1.5E-10	TH-228	1.35E-06	1.4E+00	5.5E-11	7.7E-11	2.3E-10
TH-230	1.33E-06	2.6E+00	1.3E-11	3.4E-11	TH-230	1.33E-06	1.4E+00	1.3E-11	1.8E-11	5.2E-11
TH-232	1.01E-06	2.0E+00	1.7E-10	3.4E-10	TH-232	1.01E-06	1.1E+00	1.7E-10	1.8E-10	5.2E-10
U-234	1.32E-06	2.6E+00	1.6E-11	4.2E-11	U-234	1.32E-06	1.4E+00	1.6E-11	2.2E-11	6.4E-11
U-235/236	5.88E-08	1.2E-01	1.6E-11	1.9E-12	U-235/236	5.88E-08	6.1E-02	1.6E-11	9.8E-13	2.8E-12
U-238	1.32E-06	2.6E+00	2.8E-11	7.3E-11	U-238	1.32E-06	1.4E+00	2.8E-11	3.9E-11	1.1E-10
			Total Pathway:	4.7E-09				Total Pathway:	2.5E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.05E-05	4.5E-08	1.8E+00	7.8E-08	Arsenic	4.05E-05	2.4E-08	1.8E+00	4.1E-08	1.2E-07
Beryllium	1.85E-06	2.0E-09	4.3E+00	8.7E-09	Beryllium	1.85E-06	1.1E-09	4.3E+00	4.6E-09	1.3E-08
Lead	2.16E-05	2.4E-08			Lead	2.16E-05	1.3E-08			
Thallium	1.07E-06	1.2E-09			Thallium	1.07E-06	6.2E-10			
TH-TOTAL	9.15E-06	1.0E-08			TH-TOTAL	9.15E-06	5.3E-09			
2-Methylnaphthalen	7.18E-08	7.9E-11			2-Methylnaphthalene	7.18E-08	4.2E-11			
Benzo(a)anthracene	4.33E-08	4.8E-11	7.3E-01	3.5E-11	Benzo(a)anthracene	4.30E-08	2.5E-11	7.3E-01	1.8E-11	5.3E-11
Benzo(a)pyrene	4.58E-08	5.0E-11	7.3E+00	3.7E-10	Benzo(a)pyrene	4.55E-08	2.7E-11	7.3E+00	1.9E-10	5.6E-10
Benzo(b)fluoranthen	6.84E-08	7.5E-11	7.3E-01	5.5E-11	Benzo(b)fluoranthene	6.78E-08	4.0E-11	7.3E-01	2.9E-11	8.4E-11
Phenanthrene	8.16E-08	9.0E-11			Phenanthrene	7.96E-08	4.6E-11			
			Total Pathway:	8.7E-08				Total Pathway:	4.6E-08	
			Total Rad + Chem	9.2E-08				Total Rad + Chem	4.9E-08	*Total:* 1.4E-07

TABLE B.3.1-14 (a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.7E-07	9.3E-01		
NP-237	2.0E-06	4.0E+00		
PU-238	2.6E-07	5.1E-01		
PU-239/240	1.2E-07	2.4E-01		
RA-226	1.7E-06	3.4E+00		
RA-228	1.2E-06	2.3E+00		
SR-90	1.8E-06	3.6E+00		
TH-228	1.4E-06	2.7E+00		
TH-230	1.3E-06	2.6E+00		
TH-232	1.0E-06	2.0E+00		
U-234	1.3E-06	2.6E+00		
U-235/236	5.9E-08	1.2E-01		
U-238	1.3E-06	2.6E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.73E-07	4.9E-01		
NP-237	2.03E-06	2.1E+00		
PU-238	2.56E-07	2.7E-01		
PU-239/240	1.21E-07	1.3E-01		
RA-226	1.73E-06	1.8E+00		
RA-228	1.16E-06	1.2E+00		
SR-90	1.85E-06	1.9E+00		
TH-228	1.35E-06	1.4E+00		
TH-230	1.33E-06	1.4E+00		
TH-232	1.01E-06	1.1E+00		
U-234	1.32E-06	1.4E+00		
U-235/236	5.88E-08	6.1E-02		
U-238	1.32E-06	1.4E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.1E-05	4.5E-08	3.0E-04	1.5E-04
Beryllium	1.8E-06	2.0E-09	5.0E-03	4.1E-07
Lead	2.2E-05	2.4E-08		
Thallium	1.1E-06	1.2E-09	7.0E-05	1.7E-05
TH-TOTAL	9.1E-06	1.0E-08		
2-Methylnaphthalene	7.2E-08	7.9E-11		
Benzo(a)anthracene	4.3E-08	4.8E-11		
Benzo(a)pyrene	4.6E-08	5.0E-11		
Benzo(b)fluoranthene	6.8E-08	7.5E-11		
Phenanthrene	8.2E-08	9.0E-11		

Total Pathway: 1.7E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.05E-05	2.4E-08	3.0E-04	7.9E-05
Beryllium	1.85E-06	1.1E-09	5.0E-03	2.2E-07
Lead	2.16E-05	1.3E-08		
Thallium	1.07E-06	6.2E-10	7.0E-05	8.9E-06
TH-TOTAL	9.15E-06	5.3E-09		
2-Methylnaphthalene	7.18E-08	4.2E-11		
Benzo(a)anthracene	4.30E-08	2.5E-11		
Benzo(a)pyrene	4.55E-08	2.7E-11		
Benzo(b)fluoranthene	6.78E-08	4.0E-11		
Phenanthrene	7.96E-08	4.6E-11		

Total Pathway: 8.8E-05

2.3E-04

6.2E-07

2.6E-05

Total Rad + Chem 1.7E-04

Total Rad + Chem 8.8E-05 *Total:* 2.5E-04

TABLE B.3.1-14 (a)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.25E-04	2.5E+02	2.2E-10	5.4E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.63E-04	5.2E+02	7.8E-10	4.0E-07
RA-228			1.0E-10	
SR-90	1.45E-02	2.9E+04	3.6E-11	1.0E-06
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.76E-04	1.3E+03	1.6E-11	2.1E-08
U-235/236	1.40E-02	2.8E+04	1.6E-11	4.4E-07
U-238			2.8E-11	
			Total Pathway:	2.0E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.25E-04	1.3E+02	2.2E-10	2.9E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.63E-04	2.7E+02	7.8E-10	2.1E-07
RA-228			1.0E-10	
SR-90	1.45E-02	1.5E+04	3.6E-11	5.5E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.76E-04	7.1E+02	1.6E-11	1.1E-08
U-235/236	1.40E-02	1.5E+04	1.6E-11	2.3E-07
U-238			2.8E-11	
			Total Pathway:	1.0E-06

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	4.71E-07	5.2E-10	1.8E+00	9.1E-10
Beryllium	7.47E-09	8.2E-12	4.3E+00	3.5E-11
Lead	3.08E-05	3.4E-08		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	5.00E-02	5.5E-05		
			Total Pathway:	9.4E-10
			Total Rad + Chem	2.0E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	6.8E-16	1.8E+00	1.2E-15
Beryllium	9.71E-15	5.7E-18	4.3E+00	2.4E-17
Lead	1.09E-08	6.4E-12		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	2.2E-04		
			Total Pathway:	1.2E-15
			Total Rad + Chem	1.0E-06

	Total	Total Dust & Groundwater Affected
		4.0E-11
	8.3E-08	8.4E-08
		1.7E-10
		8.4E-11
	6.2E-07	6.2E-07
		3.5E-10
	1.6E-06	1.6E-06
		2.3E-10
		5.2E-11
		5.2E-10
	3.3E-08	3.3E-08
	6.7E-07	6.7E-07
		1.1E-10
		1.2E-07
	9.1E-10	
	3.5E-11	1.3E-08
		5.3E-11
		5.6E-10
		8.4E-11
Total:	3.0E-06	3.1E-06

TABLE B.3.1-14 (a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	1.2E-04	2.5E+02			NP-237	1.25E-04	1.3E+02				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226	2.6E-04	5.2E+02			RA-226	2.63E-04	2.7E+02				
RA-228					RA-228						
SR-90	1.5E-02	2.9E+04			SR-90	1.45E-02	1.5E+04				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	6.8E-04	1.3E+03			U-234	6.76E-04	7.1E+02				
U-235/236	1.4E-02	2.8E+04			U-235/236	1.40E-02	1.5E+04				
U-238					U-238						
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Arsenic	4.7E-07	5.2E-10	3.0E-04	1.7E-06	Arsenic	1.16E-12	6.8E-16	3.0E-04	2.3E-12	1.7E-06	2.3E-04
Beryllium	7.5E-09	8.2E-12	5.0E-03	1.6E-09	Beryllium	9.71E-15	5.7E-18	5.0E-03	1.1E-15	1.6E-09	6.2E-07
Lead	3.1E-05	3.4E-08			Lead	1.09E-08	6.4E-12				
Thallium			7.0E-05		Thallium			7.0E-05			2.6E-05
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Phenanthrene					Phenanthrene						
U-Total	5.0E-02	5.5E-05	3.0E-03	1.8E-02	U-Total	3.80E-01	2.2E-04	3.0E-03	7.4E-02	9.2E-02	9.2E-02
			Total Pathway:	1.8E-02				Total Pathway:	7.4E-02		
			Total Rad + Chem	1.8E-02				Total Rad + Chem	7.4E-02	*Total:* 9.2E-02	9.3E-02

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TABLE B.3.1-14 (b)

FUTURE OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.74E-07	4.0E-02	2.8E-11	1.1E-12	CS-137	4.73E-07	6.1E-02	2.8E-11	1.7E-12	2.8E-12
NP-237	2.03E-06	1.7E-01	2.2E-10	3.8E-11	NP-237	2.03E-06	2.6E-01	2.2E-10	5.7E-11	9.5E-11
PU-238	2.57E-07	2.2E-02	2.2E-10	4.7E-12	PU-238	2.56E-07	3.3E-02	2.2E-10	7.2E-12	1.2E-11
PU-239/240	1.21E-07	1.0E-02	2.3E-10	2.3E-12	PU-239/240	1.21E-07	1.6E-02	2.3E-10	3.6E-12	5.9E-12
RA-226	1.73E-06	1.5E-01	7.8E-10	1.1E-10	RA-226	1.73E-06	2.2E-01	7.8E-10	1.7E-10	2.9E-10
RA-228	1.17E-06	9.9E-02	1.0E-10	9.9E-12	RA-228	1.16E-06	1.5E-01	1.0E-10	1.5E-11	2.5E-11
SR-90	1.85E-06	1.6E-01	3.6E-11	5.6E-12	SR-90	1.85E-06	2.4E-01	3.6E-11	8.5E-12	1.4E-11
TH-228	1.39E-06	1.2E-01	5.5E-11	6.4E-12	TH-228	1.35E-06	1.7E-01	5.5E-11	9.5E-12	1.6E-11
TH-230	1.33E-06	1.1E-01	1.3E-11	1.5E-12	TH-230	1.33E-06	1.7E-01	1.3E-11	2.2E-12	3.7E-12
TH-232	1.01E-06	8.5E-02	1.7E-10	1.4E-11	TH-232	1.01E-06	1.3E-01	1.7E-10	2.2E-11	3.6E-11
U-234	1.32E-06	1.1E-01	1.6E-11	1.8E-12	U-234	1.32E-06	1.7E-01	1.6E-11	2.7E-12	4.5E-12
U-235/236	5.88E-08	4.9E-03	1.6E-11	7.9E-14	U-235/236	5.88E-08	7.6E-03	1.6E-11	1.2E-13	2.0E-13
U-238	1.32E-06	1.1E-01	2.8E-11	3.1E-12	U-238	1.32E-06	1.7E-01	2.8E-11	4.7E-12	7.8E-12
			Total Pathway:	2.0E-10				Total Pathway:	3.1E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.05E-05	8.9E-09	1.8E+00	1.6E-08	Arsenic	4.05E-05	1.4E-08	1.8E+00	2.4E-08	3.9E-08
Beryllium	1.85E-06	4.0E-10	4.3E+00	1.7E-09	Beryllium	1.85E-06	6.2E-10	4.3E+00	2.7E-09	4.4E-09
Lead	2.16E-05	4.7E-09			Lead	2.16E-05	7.2E-09			
Thallium	1.07E-06	2.3E-10			Thallium	1.07E-06	3.6E-10			
TH-TOTAL	9.15E-06	2.0E-09			TH-TOTAL	9.15E-06	3.1E-09			
2-Methylnaphthalen	7.18E-08	1.6E-11			2-Methylnaphthalene	7.18E-08	2.4E-11			
Benzo(a)anthracene	4.33E-08	9.5E-12	7.3E-01	6.9E-12	Benzo(a)anthracene	4.30E-08	1.4E-11	7.3E-01	1.1E-11	1.7E-11
Benzo(a)pyrene	4.58E-08	1.0E-11	7.3E+00	7.3E-11	Benzo(a)pyrene	4.55E-08	1.5E-11	7.3E+00	1.1E-10	1.8E-10
Benzo(b)fluoranthen	6.84E-08	1.5E-11	7.3E-01	1.1E-11	Benzo(b)fluoranthene	6.78E-08	2.3E-11	7.3E-01	1.7E-11	2.8E-11
Phenanthrene	8.16E-08	1.8E-11			Phenanthrene	7.96E-08	2.7E-11			
			Total Pathway:	1.7E-08				Total Pathway:	2.7E-08	
			Total Rad + Chem	1.8E-08				Total Rad + Chem	2.7E-08	*Total:* 4.4E-08

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TABLE B.3.1-14 (b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.7E-07	4.0E-02		
NP-237	2.0E-06	1.7E-01		
PU-238	2.6E-07	2.2E-02		
PU-239/240	1.2E-07	1.0E-02		
RA-226	1.7E-06	1.5E-01		
RA-228	1.2E-06	9.9E-02		
SR-90	1.8E-06	1.6E-01		
TH-228	1.4E-06	1.2E-01		
TH-230	1.3E-06	1.1E-01		
TH-232	1.0E-06	8.5E-02		
U-234	1.3E-06	1.1E-01		
U-235/236	5.9E-08	4.9E-03		
U-238	1.3E-06	1.1E-01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.73E-07	6.1E-02		
NP-237	2.03E-06	2.6E-01		
PU-238	2.56E-07	3.3E-02		
PU-239/240	1.21E-07	1.6E-02		
RA-226	1.73E-06	2.2E-01		
RA-228	1.16E-06	1.5E-01		
SR-90	1.85E-06	2.4E-01		
TH-228	1.35E-06	1.7E-01		
TH-230	1.33E-06	1.7E-01		
TH-232	1.01E-06	1.3E-01		
U-234	1.32E-06	1.7E-01		
U-235/236	5.88E-08	7.6E-03		
U-238	1.32E-06	1.7E-01		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.1E-05	1.0E-07	3.0E-04	3.5E-04
Beryllium	1.8E-06	4.7E-09	5.0E-03	9.4E-07
Lead	2.2E-05	5.5E-08		
Thallium	1.1E-06	2.7E-09	7.0E-05	3.9E-05
TH-TOTAL	9.1E-06	2.3E-08		
2-Methylnaphthalene	7.2E-08	1.8E-10		
Benzo(a)anthracene	4.3E-08	1.1E-10		
Benzo(a)pyrene	4.6E-08	1.2E-10		
Benzo(b)fluoranthene	6.8E-08	1.7E-10		
Phenanthrene	8.2E-08	2.1E-10		

Total Pathway: 3.9E-04

Total Rad + Chem 3.9E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.05E-05	1.6E-07	3.0E-04	5.3E-04
Beryllium	1.85E-06	7.2E-09	5.0E-03	1.4E-06
Lead	2.16E-05	8.5E-08		
Thallium	1.07E-06	4.2E-09	7.0E-05	6.0E-05
TH-TOTAL	9.15E-06	3.6E-08		
2-Methylnaphthalene	7.18E-08	2.8E-10		
Benzo(a)anthracene	4.30E-08	1.7E-10		
Benzo(a)pyrene	4.55E-08	1.8E-10		
Benzo(b)fluoranthene	6.78E-08	2.7E-10		
Phenanthrene	7.96E-08	3.1E-10		

Total Pathway: 5.9E-04

Total Rad + Chem 5.9E-04

8.7E-04	
2.4E-06	
9.9E-05	
Total:	9.7E-04

TABLE B.3.1-14 (b)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			2.8E-12
NP-237	1.25E-04	1.0E+01	2.2E-10	2.3E-09	NP-237	1.25E-04	1.6E+01	2.2E-10	3.5E-09	5.8E-09	5.9E-09
PU-238			2.2E-10		PU-238			2.2E-10			1.2E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			5.9E-12
RA-226	2.63E-04	2.2E+01	7.8E-10	1.7E-08	RA-226	2.63E-04	3.4E+01	7.8E-10	2.6E-08	4.4E-08	4.4E-08
RA-228			1.0E-10		RA-228			1.0E-10			2.5E-11
SR-90	1.45E-02	1.2E+03	3.6E-11	4.4E-08	SR-90	1.45E-02	1.9E+03	3.6E-11	6.7E-08	1.1E-07	1.1E-07
TH-228			5.5E-11		TH-228			5.5E-11			1.6E-11
TH-230			1.3E-11		TH-230			1.3E-11			3.7E-12
TH-232			1.7E-10		TH-232			1.7E-10			3.6E-11
U-234	6.76E-04	5.7E+01	1.6E-11	9.1E-10	U-234	6.76E-04	8.7E+01	1.6E-11	1.4E-09	2.3E-09	2.3E-09
U-235/236	1.40E-02	1.2E+03	1.6E-11	1.9E-08	U-235/236	1.40E-02	1.8E+03	1.6E-11	2.9E-08	4.7E-08	4.7E-08
U-238			2.8E-11		U-238			2.8E-11			7.8E-12
			Total Pathway:	8.3E-08				Total Pathway:	1.3E-07		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic	4.71E-07	1.0E-10	1.8E+00	1.8E-10	Arsenic	1.16E-12	3.9E-16	1.8E+00	6.8E-16	1.8E-10	3.9E-08
Beryllium	7.47E-09	1.6E-12	4.3E+00	7.0E-12	Beryllium	9.71E-15	3.3E-18	4.3E+00	1.4E-17	7.0E-12	4.4E-09
Lead	3.08E-05	6.8E-09			Lead	1.09E-08	3.7E-12				
Thallium					Thallium						
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			1.7E-11
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			1.8E-10
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			2.8E-11
Phenanthrene					Phenanthrene						
U-Total	5.00E-02	1.1E-05			U-Total	3.80E-01	1.3E-04				
			Total Pathway:	1.9E-10				Total Pathway:	7.0E-16		
			Total Rad + Chem	8.3E-08				Total Rad + Chem	1.3E-07	*Total:* 2.1E-07	2.6E-07

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TABLE B.3.1-14 (b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.2E-04	1.0E+01		
PU-238				
PU-239/240				
RA-226	2.6E-04	2.2E+01		
RA-228				
SR-90	1.5E-02	1.2E+03		
TH-228				
TH-230				
TH-232				
U-234	6.8E-04	5.7E+01		
U-235/236	1.4E-02	1.2E+03		
U-238				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.25E-04	1.6E+01		
PU-238				
PU-239/240				
RA-226	2.63E-04	3.4E+01		
RA-228				
SR-90	1.45E-02	1.9E+03		
TH-228				
TH-230				
TH-232				
U-234	6.76E-04	8.7E+01		
U-235/236	1.40E-02	1.8E+03		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.7E-07	1.2E-09	3.0E-04	4.0E-06
Beryllium	7.5E-09	1.9E-11	5.0E-03	3.8E-09
Lead	3.1E-05	7.9E-08		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	5.0E-02	1.3E-04	3.0E-03	4.3E-02

Total Pathway: 4.3E-02

Total Rad + Chem 4.3E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.16E-12	4.5E-15	3.0E-04	1.5E-11
Beryllium	9.71E-15	3.8E-17	5.0E-03	7.6E-15
Lead	1.09E-08	4.3E-11		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.80E-01	1.5E-03	3.0E-03	5.0E-01

Total Pathway: 5.0E-01

Total Rad + Chem 5.0E-01

	Total	Total Dust & Groundwater Affected
	4.0E-06	8.8E-04
	3.8E-09	2.4E-06
		9.9E-05
	5.4E-01	5.4E-01
Total:	5.4E-01	5.4E-01

TABLE B.3.1-14 (c)

FUTURE OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.74E-07	9.3E-01	2.8E-11	2.6E-11	CS-137	4.73E-07	4.9E-01	2.8E-11	1.4E-11	4.0E-11
NP-237	2.03E-06	4.0E+00	2.2E-10	8.8E-10	NP-237	2.03E-06	2.1E+00	2.2E-10	4.7E-10	1.3E-09
PU-238	2.57E-07	5.1E-01	2.2E-10	1.1E-10	PU-238	2.56E-07	2.7E-01	2.2E-10	5.9E-11	1.7E-10
PU-239/240	1.21E-07	2.4E-01	2.3E-10	5.5E-11	PU-239/240	1.21E-07	1.3E-01	2.3E-10	2.9E-11	8.4E-11
RA-226	1.73E-06	3.4E+00	7.8E-10	2.7E-09	RA-226	1.73E-06	1.8E+00	7.8E-10	1.4E-09	4.1E-09
RA-228	1.17E-06	2.3E+00	1.0E-10	2.3E-10	RA-228	1.16E-06	1.2E+00	1.0E-10	1.2E-10	3.5E-10
SR-90	1.85E-06	3.6E+00	3.6E-11	1.3E-10	SR-90	1.85E-06	1.9E+00	3.6E-11	6.9E-11	2.0E-10
TH-228	1.39E-06	2.7E+00	5.5E-11	1.5E-10	TH-228	1.35E-06	1.4E+00	5.5E-11	7.7E-11	2.3E-10
TH-230	1.33E-06	2.6E+00	1.3E-11	3.4E-11	TH-230	1.33E-06	1.4E+00	1.3E-11	1.8E-11	5.2E-11
TH-232	1.01E-06	2.0E+00	1.7E-10	3.4E-10	TH-232	1.01E-06	1.1E+00	1.7E-10	1.8E-10	5.2E-10
U-234	1.32E-06	2.6E+00	1.6E-11	4.2E-11	U-234	1.32E-06	1.4E+00	1.6E-11	2.2E-11	6.4E-11
U-235/236	5.88E-08	1.2E-01	1.6E-11	1.9E-12	U-235/236	5.88E-08	6.1E-02	1.6E-11	9.8E-13	2.8E-12
U-238	1.32E-06	2.6E+00	2.8E-11	7.3E-11	U-238	1.32E-06	1.4E+00	2.8E-11	3.9E-11	1.1E-10
			Total Pathway:	4.7E-09				Total Pathway:	2.5E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.05E-05	4.5E-08	1.8E+00	7.8E-08	Arsenic	4.05E-05	2.4E-08	1.8E+00	4.1E-08	1.2E-07
Beryllium	1.85E-06	2.0E-09	4.3E+00	8.7E-09	Beryllium	1.85E-06	1.1E-09	4.3E+00	4.6E-09	1.3E-08
Lead	2.16E-05	2.4E-08			Lead	2.16E-05	1.3E-08			
Thallium	1.07E-06	1.2E-09			Thallium	1.07E-06	6.2E-10			
TH-TOTAL	9.15E-06	1.0E-08			TH-TOTAL	9.15E-06	5.3E-09			
2-Methylnaphthalen	7.18E-08	7.9E-11			2-Methylnaphthalene	7.18E-08	4.2E-11			
Benzo(a)anthracene	4.33E-08	4.8E-11	7.3E-01	3.5E-11	Benzo(a)anthracene	4.30E-08	2.5E-11	7.3E-01	1.8E-11	5.3E-11
Benzo(a)pyrene	4.58E-08	5.0E-11	7.3E+00	3.7E-10	Benzo(a)pyrene	4.55E-08	2.7E-11	7.3E+00	1.9E-10	5.6E-10
Benzo(b)fluoranthen	6.84E-08	7.5E-11	7.3E-01	5.5E-11	Benzo(b)fluoranthene	6.78E-08	4.0E-11	7.3E-01	2.9E-11	8.4E-11
Phenanthrene	8.16E-08	9.0E-11			Phenanthrene	7.96E-08	4.6E-11			
			Total Pathway:	8.7E-08				Total Pathway:	4.6E-08	
			Total Rad + Chem	9.2E-08				Total Rad + Chem	4.9E-08	*Total:* 1.4E-07

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TABLE B.3.1-14 (c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	4.7E-07	9.3E-01			CS-137	4.73E-07	4.9E-01			
NP-237	2.0E-06	4.0E+00			NP-237	2.03E-06	2.1E+00			
PU-238	2.6E-07	5.1E-01			PU-238	2.56E-07	2.7E-01			
PU-239/240	1.2E-07	2.4E-01			PU-239/240	1.21E-07	1.3E-01			
RA-226	1.7E-06	3.4E+00			RA-226	1.73E-06	1.8E+00			
RA-228	1.2E-06	2.3E+00			RA-228	1.16E-06	1.2E+00			
SR-90	1.8E-06	3.6E+00			SR-90	1.85E-06	1.9E+00			
TH-228	1.4E-06	2.7E+00			TH-228	1.35E-06	1.4E+00			
TH-230	1.3E-06	2.6E+00			TH-230	1.33E-06	1.4E+00			
TH-232	1.0E-06	2.0E+00			TH-232	1.01E-06	1.1E+00			
U-234	1.3E-06	2.6E+00			U-234	1.32E-06	1.4E+00			
U-235/236	5.9E-08	1.2E-01			U-235/236	5.88E-08	6.1E-02			
U-238	1.3E-06	2.6E+00			U-238	1.32E-06	1.4E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	4.1E-05	4.5E-08	3.0E-04	1.5E-04	Arsenic	4.05E-05	2.4E-08	3.0E-04	7.9E-05	2.3E-04
Beryllium	1.8E-06	2.0E-09	5.0E-03	4.1E-07	Beryllium	1.85E-06	1.1E-09	5.0E-03	2.2E-07	6.2E-07
Lead	2.2E-05	2.4E-08			Lead	2.16E-05	1.3E-08			
Thallium	1.1E-06	1.2E-09	7.0E-05	1.7E-05	Thallium	1.07E-06	6.2E-10	7.0E-05	8.9E-06	2.6E-05
TH-TOTAL	9.1E-06	1.0E-08			TH-TOTAL	9.15E-06	5.3E-09			
2-Methylnaphthalene	7.2E-08	7.9E-11			2-Methylnaphthalene	7.18E-08	4.2E-11			
Benzo(a)anthracene	4.3E-08	4.8E-11			Benzo(a)anthracene	4.30E-08	2.5E-11			
Benzo(a)pyrene	4.6E-08	5.0E-11			Benzo(a)pyrene	4.55E-08	2.7E-11			
Benzo(b)fluoranthene	6.8E-08	7.5E-11			Benzo(b)fluoranthene	6.78E-08	4.0E-11			
Phenanthrene	8.2E-08	9.0E-11			Phenanthrene	7.96E-08	4.6E-11			
		Total Pathway:		1.7E-04			Total Pathway:		8.8E-05	
		Total Rad + Chem		1.7E-04			Total Rad + Chem		8.8E-05	*Total:* 2.5E-04

TABLE B.3.1-14 (c)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.25E-04	2.5E+02	2.2E-10	5.4E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.63E-04	5.2E+02	7.8E-10	4.0E-07
RA-228			1.0E-10	
SR-90	1.45E-02	2.9E+04	3.6E-11	1.0E-06
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.76E-04	1.3E+03	1.6E-11	2.1E-08
U-235/236	1.40E-02	2.8E+04	1.6E-11	4.4E-07
U-238			2.8E-11	
			Total Pathway:	2.0E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.25E-04	1.3E+02	2.2E-10	2.9E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.63E-04	2.7E+02	7.8E-10	2.1E-07
RA-228			1.0E-10	
SR-90	1.45E-02	1.5E+04	3.6E-11	5.5E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.76E-04	7.1E+02	1.6E-11	1.1E-08
U-235/236	1.40E-02	1.5E+04	1.6E-11	2.3E-07
U-238			2.8E-11	
			Total Pathway:	1.0E-06

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	4.71E-07	5.2E-10	1.8E+00	9.1E-10
Beryllium	7.47E-09	8.2E-12	4.3E+00	3.5E-11
Lead	3.08E-05	3.4E-08		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	5.00E-02	5.5E-05		
			Total Pathway:	9.4E-10
			Total Rad + Chem	2.0E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	6.8E-16	1.8E+00	1.2E-15
Beryllium	9.71E-15	5.7E-18	4.3E+00	2.4E-17
Lead	1.09E-08	6.4E-12		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	2.2E-04		
			Total Pathway:	1.2E-15
			Total Rad + Chem	1.0E-06

	Total	Total Dust & Groundwater Affected
		4.0E-11
	8.3E-08	8.4E-08
		1.7E-10
		8.4E-11
	6.2E-07	6.2E-07
		3.5E-10
	1.6E-06	1.6E-06
		2.3E-10
		5.2E-11
		5.2E-10
	3.3E-08	3.3E-08
	6.7E-07	6.7E-07
		1.1E-10
	9.1E-10	1.2E-07
	3.5E-11	1.3E-08
		5.3E-11
		5.6E-10
		8.4E-11
Total:	3.0E-06	3.1E-06

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TABLE B.3.1-14 (c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.2E-04	2.5E+02		
PU-238				
PU-239/240				
RA-226	2.6E-04	5.2E+02		
RA-228				
SR-90	1.5E-02	2.9E+04		
TH-228				
TH-230				
TH-232				
U-234	6.8E-04	1.3E+03		
U-235/236	1.4E-02	2.8E+04		
U-238				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.25E-04	1.3E+02		
PU-238				
PU-239/240				
RA-226	2.63E-04	2.7E+02		
RA-228				
SR-90	1.45E-02	1.5E+04		
TH-228				
TH-230				
TH-232				
U-234	6.76E-04	7.1E+02		
U-235/236	1.40E-02	1.5E+04		
U-238				

Total Pathway:

	Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.7E-07	5.2E-10	3.0E-04	1.7E-06
Beryllium	7.5E-09	8.2E-12	5.0E-03	1.6E-09
Lead	3.1E-05	3.4E-08		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	5.0E-02	5.5E-05	3.0E-03	1.8E-02

Total Pathway: 1.8E-02

Total Rad + Chem 1.8E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.16E-12	6.8E-16	3.0E-04	2.3E-12
Beryllium	9.71E-15	5.7E-18	5.0E-03	1.1E-15
Lead	1.09E-08	6.4E-12		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.80E-01	2.2E-04	3.0E-03	7.4E-02

Total Pathway: 7.4E-02

Total Rad + Chem 7.4E-02

	Total	Total Dust & Groundwater Affected
	1.7E-06	2.3E-04
	1.6E-09	6.2E-07
		2.6E-05
U-Total	9.2E-02	9.2E-02
Total:	9.2E-02	9.3E-02

TABLE B.3.1-14 (d)

FUTURE OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.74E-07	4.0E-02	2.8E-11	1.1E-12	CS-137	4.73E-07	6.1E-02	2.8E-11	1.7E-12	2.8E-12
NP-237	2.03E-06	1.7E-01	2.2E-10	3.8E-11	NP-237	2.03E-06	2.6E-01	2.2E-10	5.7E-11	9.5E-11
PU-238	2.57E-07	2.2E-02	2.2E-10	4.7E-12	PU-238	2.56E-07	3.3E-02	2.2E-10	7.2E-12	1.2E-11
PU-239/240	1.21E-07	1.0E-02	2.3E-10	2.3E-12	PU-239/240	1.21E-07	1.6E-02	2.3E-10	3.6E-12	5.9E-12
RA-226	1.73E-06	1.5E-01	7.8E-10	1.1E-10	RA-226	1.73E-06	2.2E-01	7.8E-10	1.7E-10	2.9E-10
RA-228	1.17E-06	9.9E-02	1.0E-10	9.9E-12	RA-228	1.16E-06	1.5E-01	1.0E-10	1.5E-11	2.5E-11
SR-90	1.85E-06	1.6E-01	3.6E-11	5.6E-12	SR-90	1.85E-06	2.4E-01	3.6E-11	8.5E-12	1.4E-11
TH-228	1.39E-06	1.2E-01	5.5E-11	6.4E-12	TH-228	1.35E-06	1.7E-01	5.5E-11	9.5E-12	1.6E-11
TH-230	1.33E-06	1.1E-01	1.3E-11	1.5E-12	TH-230	1.33E-06	1.7E-01	1.3E-11	2.2E-12	3.7E-12
TH-232	1.01E-06	8.5E-02	1.7E-10	1.4E-11	TH-232	1.01E-06	1.3E-01	1.7E-10	2.2E-11	3.6E-11
U-234	1.32E-06	1.1E-01	1.6E-11	1.8E-12	U-234	1.32E-06	1.7E-01	1.6E-11	2.7E-12	4.5E-12
U-235/236	5.88E-08	4.9E-03	1.6E-11	7.9E-14	U-235/236	5.88E-08	7.6E-03	1.6E-11	1.2E-13	2.0E-13
U-238	1.32E-06	1.1E-01	2.8E-11	3.1E-12	U-238	1.32E-06	1.7E-01	2.8E-11	4.7E-12	7.8E-12
			Total Pathway:	2.0E-10				Total Pathway:	3.1E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.05E-05	8.9E-09	1.8E+00	1.6E-08	Arsenic	4.05E-05	1.4E-08	1.8E+00	2.4E-08	3.9E-08
Beryllium	1.85E-06	4.0E-10	4.3E+00	1.7E-09	Beryllium	1.85E-06	6.2E-10	4.3E+00	2.7E-09	4.4E-09
Lead	2.16E-05	4.7E-09			Lead	2.16E-05	7.2E-09			
Thallium	1.07E-06	2.3E-10			Thallium	1.07E-06	3.6E-10			
TH-TOTAL	9.15E-06	2.0E-09			TH-TOTAL	9.15E-06	3.1E-09			
2-Methylnaphthalen	7.18E-08	1.6E-11			2-Methylnaphthalene	7.18E-08	2.4E-11			
Benzo(a)anthracene	4.33E-08	9.5E-12	7.3E-01	6.9E-12	Benzo(a)anthracene	4.30E-08	1.4E-11	7.3E-01	1.1E-11	1.7E-11
Benzo(a)pyrene	4.58E-08	1.0E-11	7.3E+00	7.3E-11	Benzo(a)pyrene	4.55E-08	1.5E-11	7.3E+00	1.1E-10	1.8E-10
Benzo(b)fluoranthen	6.84E-08	1.5E-11	7.3E-01	1.1E-11	Benzo(b)fluoranthene	6.78E-08	2.3E-11	7.3E-01	1.7E-11	2.8E-11
Phenanthrene	8.16E-08	1.8E-11			Phenanthrene	7.96E-08	2.7E-11			
			Total Pathway:	1.7E-08				Total Pathway:	2.7E-08	
			Total Rad + Chem	1.8E-08				Total Rad + Chem	2.7E-08	*Total:* 4.4E-08

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TABLE B.3.1-14 (d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.7E-07	4.0E-02		
NP-237	2.0E-06	1.7E-01		
PU-238	2.6E-07	2.2E-02		
PU-239/240	1.2E-07	1.0E-02		
RA-226	1.7E-06	1.5E-01		
RA-228	1.2E-06	9.9E-02		
SR-90	1.8E-06	1.6E-01		
TH-228	1.4E-06	1.2E-01		
TH-230	1.3E-06	1.1E-01		
TH-232	1.0E-06	8.5E-02		
U-234	1.3E-06	1.1E-01		
U-235/236	5.9E-08	4.9E-03		
U-238	1.3E-06	1.1E-01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.73E-07	6.1E-02		
NP-237	2.03E-06	2.6E-01		
PU-238	2.56E-07	3.3E-02		
PU-239/240	1.21E-07	1.6E-02		
RA-226	1.73E-06	2.2E-01		
RA-228	1.16E-06	1.5E-01		
SR-90	1.85E-06	2.4E-01		
TH-228	1.35E-06	1.7E-01		
TH-230	1.33E-06	1.7E-01		
TH-232	1.01E-06	1.3E-01		
U-234	1.32E-06	1.7E-01		
U-235/236	5.88E-08	7.6E-03		
U-238	1.32E-06	1.7E-01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.1E-05	1.0E-07	3.0E-04	3.5E-04
Beryllium	1.8E-06	4.7E-09	5.0E-03	9.4E-07
Lead	2.2E-05	5.5E-08		
Thallium	1.1E-06	2.7E-09	7.0E-05	3.9E-05
TH-TOTAL	9.1E-06	2.3E-08		
2-Methylnaphthalene	7.2E-08	1.8E-10		
Benzo(a)anthracene	4.3E-08	1.1E-10		
Benzo(a)pyrene	4.6E-08	1.2E-10		
Benzo(b)fluoranthene	6.8E-08	1.7E-10		
Phenanthrene	8.2E-08	2.1E-10		

Total Pathway: 3.9E-04

Total Rad + Chem 3.9E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.05E-05	1.6E-07	3.0E-04	5.3E-04
Beryllium	1.85E-06	7.2E-09	5.0E-03	1.4E-06
Lead	2.16E-05	8.5E-08		
Thallium	1.07E-06	4.2E-09	7.0E-05	6.0E-05
TH-TOTAL	9.15E-06	3.6E-08		
2-Methylnaphthalene	7.18E-08	2.8E-10		
Benzo(a)anthracene	4.30E-08	1.7E-10		
Benzo(a)pyrene	4.55E-08	1.8E-10		
Benzo(b)fluoranthene	6.78E-08	2.7E-10		
Phenanthrene	7.96E-08	3.1E-10		

Total Pathway: 5.9E-04

Total Rad + Chem 5.9E-04

Total	
	8.7E-04
	2.4E-06
	9.9E-05
Total:	9.7E-04

TABLE B.3.1-14 (d)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.25E-04	1.0E+01	2.2E-10	2.3E-09
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.63E-04	2.2E+01	7.8E-10	1.7E-08
RA-228			1.0E-10	
SR-90	1.45E-02	1.2E+03	3.6E-11	4.4E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.76E-04	5.7E+01	1.6E-11	9.1E-10
U-235/236	1.40E-02	1.2E+03	1.6E-11	1.9E-08
U-238			2.8E-11	
		Total Pathway:		8.3E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.25E-04	1.6E+01	2.2E-10	3.5E-09
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.63E-04	3.4E+01	7.8E-10	2.6E-08
RA-228			1.0E-10	
SR-90	1.45E-02	1.9E+03	3.6E-11	6.7E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.76E-04	8.7E+01	1.6E-11	1.4E-09
U-235/236	1.40E-02	1.8E+03	1.6E-11	2.9E-08
U-238			2.8E-11	
		Total Pathway:		1.3E-07

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	4.71E-07	1.0E-10	1.8E+00	1.8E-10
Beryllium	7.47E-09	1.6E-12	4.3E+00	7.0E-12
Lead	3.08E-05	6.8E-09		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	5.00E-02	1.1E-05		
		Total Pathway:		1.9E-10
		Total Rad + Chem		8.3E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	3.9E-16	1.8E+00	6.8E-16
Beryllium	9.71E-15	3.3E-18	4.3E+00	1.4E-17
Lead	1.09E-08	3.7E-12		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	1.3E-04		
		Total Pathway:		7.0E-16
		Total Rad + Chem		1.3E-07

	Total	Total Dust & Groundwater Affected
CS-137		2.8E-12
NP-237	5.8E-09	5.9E-09
PU-238		1.2E-11
PU-239/240		5.9E-12
RA-226	4.4E-08	4.4E-08
RA-228		2.5E-11
SR-90	1.1E-07	1.1E-07
TH-228		1.6E-11
TH-230		3.7E-12
TH-232		3.6E-11
U-234	2.3E-09	2.3E-09
U-235/236	4.7E-08	4.7E-08
U-238		7.8E-12
Arsenic	1.8E-10	3.9E-08
Beryllium	7.0E-12	4.4E-09
Lead		
Thallium		
TH-TOTAL		
2-Methylnaphthalene		
Benzo(a)anthracene		1.7E-11
Benzo(a)pyrene		1.8E-10
Benzo(b)fluoranthene		2.8E-11
Phenanthrene		
U-Total		
Total:	2.1E-07	2.6E-07

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TABLE B.3.1-14 (d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.2E-04	1.0E+01		
PU-238				
PU-239/240				
RA-226	2.6E-04	2.2E+01		
RA-228				
SR-90	1.5E-02	1.2E+03		
TH-228				
TH-230				
TH-232				
U-234	6.8E-04	5.7E+01		
U-235/236	1.4E-02	1.2E+03		
U-238				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.25E-04	1.6E+01		
PU-238				
PU-239/240				
RA-226	2.63E-04	3.4E+01		
RA-228				
SR-90	1.45E-02	1.9E+03		
TH-228				
TH-230				
TH-232				
U-234	6.76E-04	8.7E+01		
U-235/236	1.40E-02	1.8E+03		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.7E-07	1.2E-09	3.0E-04	4.0E-06
Beryllium	7.5E-09	1.9E-11	5.0E-03	3.8E-09
Lead	3.1E-05	7.9E-08		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	5.0E-02	1.3E-04	3.0E-03	4.3E-02

Total Pathway: 4.3E-02

Total Rad + Chem 4.3E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.16E-12	4.5E-15	3.0E-04	1.5E-11
Beryllium	9.71E-15	3.8E-17	5.0E-03	7.6E-15
Lead	1.09E-08	4.3E-11		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.80E-01	1.5E-03	3.0E-03	5.0E-01

Total Pathway: 5.0E-01

Total Rad + Chem 5.0E-01

	Total	Total Dust & Groundwater Affected
U-Total	4.0E-06	8.8E-04
	3.8E-09	2.4E-06
		9.9E-05
U-Total	5.4E-01	5.4E-01
Total:	5.4E-01	5.4E-01

TABLE B.3.1-15(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
ACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.52E-02	1.2E+03	2.2E-10	2.7E-07
SR-90	5.19E-02	2.5E+03	3.6E-11	9.2E-08
U-234	2.58E+00	1.3E+05	1.6E-11	2.0E-06
U-235/236	1.38E-01	6.8E+03	1.6E-11	1.1E-07
U-238	2.85E+00	1.4E+05	2.8E-11	3.9E-06

Total Pathway: 6.4E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	7.46E-08	2.0E-09	1.8E+00	3.6E-09
Beryllium	1.40E-09	3.8E-11	4.3E+00	1.6E-10
Lead	5.82E-06	1.6E-07		
U-Total	1.02E-02	2.8E-04		
2-Methylnaphthalen				

Total Pathway: 3.7E-09

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Arsenic	7.7E-09		
Beryllium	1.4E-10		
Lead	6.0E-07		
U-Total	1.0E-03		
2-Methylnaphthalen			

Total Pathway:

Total Rad + Chem 6.4E-06

Total Rad + Chem

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TABLE B.3.1-15(a)
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				2.7E-07
				9.2E-08
				2.0E-06
				1.1E-07
				3.9E-06
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	5.9E-12	1.8E+00	1.1E-11	3.6E-09
Beryllium			1.6E-10	3.3E-10
Lead	1.8E-12			
U-Total	8.0E-07			
2-Methylnaphthalen				
		Total Pathway:	1.8E-10	

Total Rad + Chem 1.8E-10 *Total:* 6.4E-06

TABLE B.3.1-15(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.5E-02	1.2E+03		
SR-90	5.2E-02	2.5E+03		
U-234	2.6E+00	1.3E+05		
U-235/236	1.4E-01	6.8E+03		
U-238	2.9E+00	1.4E+05		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	7.5E-08	2.0E-09	3.0E-04	6.8E-06
Beryllium	1.4E-09	3.8E-11	5.0E-03	7.7E-09
Lead	5.8E-06	1.6E-07		
U-Total	1.0E-02	2.8E-04	3.0E-03	9.3E-02
2-Methylnaphthale				

Total Pathway: 9.3E-02

Total Rad + Chem 9.3E-02

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
Arsenic	7.7E-09		
Beryllium	1.4E-10		
Lead	6.0E-07		
U-Total	1.0E-03		
2-Methylnaphthalen			

Total Pathway:

Total Rad + Chem

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TABLE B.3.1-15(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	5.9E-12	2.9E-04	2.1E-08	6.8E-06
Beryllium	1.1E-13	5.0E-05	2.2E-09	9.9E-09
Lead	1.8E-12			
U-Total	8.0E-07	1.5E-04	5.4E-03	9.9E-02
2-Methylnaphthalen				
		Total Pathway:	5.4E-03	

Total Rad + Chem	5.4E-03	*Total:*	9.9E-02

TABLE B.3.1-15(b)
FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)
ACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.52E-02	5.3E+01	2.2E-10	1.2E-08
SR-90	5.19E-02	1.1E+02	3.6E-11	3.9E-09
U-234	2.58E+00	5.4E+03	1.6E-11	8.7E-08
U-235/236	1.38E-01	2.9E+02	1.6E-11	4.6E-09
U-238	2.85E+00	6.0E+03	2.8E-11	1.7E-07
			Total Pathway:	2.7E-07

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	7.46E-08	4.1E-10	1.8E+00	7.2E-10
Beryllium	1.40E-09	7.7E-12	4.3E+00	3.3E-11
Lead	5.82E-06	3.2E-08		
U-Total	1.02E-02	5.6E-05		
2-Methylnaphthalene				
			Total Pathway:	7.5E-10

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Arsenic	3.1E-09		
Beryllium	5.8E-11		
Lead	2.4E-07		
U-Total	4.2E-04		
2-Methylnaphthalen			

Total Pathway:

Total Rad + Chem 2.8E-07

Total Rad + Chem

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TABLE B.3.1-15(b)
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				1.2E-08
				3.9E-09
				8.7E-08
				4.6E-09
				1.7E-07
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	8.2E-13	1.8E+00	1.5E-12	7.2E-10
Beryllium			3.3E-11	6.6E-11
Lead	2.6E-13			
U-Total	1.1E-07			
2-Methylnaphthalen				
Total Pathway:			3.4E-11	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 3.4E-11 *Total:* 2.8E-07

TABLE B.3.1-15(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	2.5E-02	5.3E+01			Not applicable
SR-90	5.2E-02	1.1E+02			
U-234	2.6E+00	5.4E+03			
U-235/236	1.4E-01	2.9E+02			
U-238	2.9E+00	6.0E+03			
			Total Pathway:		Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic	7.5E-08	4.8E-09	3.0E-04	1.6E-05	Arsenic	3.6E-08		
Beryllium	1.4E-09	8.9E-11	5.0E-03	1.8E-08	Beryllium	6.7E-10		
Lead	5.8E-06	3.7E-07			Lead	2.8E-06		
U-Total	1.0E-02	6.5E-04	3.0E-03	2.2E-01	U-Total	4.9E-03		
2-Methylnaphthale					2-Methylnaphthalen			
			Total Pathway:	2.2E-01			Total Pathway:	
			Total Rad + Chem	2.2E-01			Total Rad + Chem	

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TABLE B.3.1-15(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	9.5E-12	2.9E-04	3.3E-08	1.6E-05
Beryllium	1.8E-13	5.0E-05	3.6E-09	2.1E-08
Lead	3.0E-12			
U-Total	1.3E-06	1.5E-04	8.7E-03	2.3E-01
2-Methylnaphthalene				
		Total Pathway:	8.7E-03	

Total Rad + Chem	8.7E-03	*Total:*	2.3E-01

TABLE B.3.1-15(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
ACTIVE FLYASH PILE: GROUNDWATER

CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237	2.52E-02	1.2E+03	2.2E-10	2.7E-07	Not applicable
SR-90	5.19E-02	2.5E+03	3.6E-11	9.2E-08	
U-234	2.58E+00	1.3E+05	1.6E-11	2.0E-06	
U-235/236	1.38E-01	6.8E+03	1.6E-11	1.1E-07	
U-238	2.85E+00	1.4E+05	2.8E-11	3.9E-06	
			Total Pathway:	6.4E-06	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
Arsenic	7.46E-08	2.0E-09	1.8E+00	3.6E-09	Arsenic	7.7E-09		
Beryllium	1.40E-09	3.8E-11	4.3E+00	1.6E-10	Beryllium	1.4E-10		
Lead	5.82E-06	1.6E-07			Lead	6.0E-07		
U-Total	1.02E-02	2.8E-04			U-Total	1.0E-03		
2-Methylnaphthalen					2-Methylnaphthalen			
			Total Pathway:	3.7E-09				Total Pathway:
			Total Rad + Chem	6.4E-06				Total Rad + Chem

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TABLE B.3.1-15(c)
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				2.7E-07
				9.2E-08
				2.0E-06
				1.1E-07
				3.9E-06
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	5.9E-12	1.8E+00	1.1E-11	3.6E-09
Beryllium			1.6E-10	3.3E-10
Lead	1.8E-12			
U-Total	8.0E-07			
2-Methylnaphthalen				
Total Pathway:			1.8E-10	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.8E-10 *Total:* 6.4E-06

TABLE B.3.1-15(c)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	2.5E-02	1.2E+03			Not applicable
SR-90	5.2E-02	2.5E+03			
U-234	2.6E+00	1.3E+05			
U-235/236	1.4E-01	6.8E+03			
U-238	2.9E+00	1.4E+05			
			Total Pathway:		Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic	7.5E-08	2.0E-09	3.0E-04	6.8E-06	Arsenic	7.7E-09		
Beryllium	1.4E-09	3.8E-11	5.0E-03	7.7E-09	Beryllium	1.4E-10		
Lead	5.8E-06	1.6E-07			Lead	6.0E-07		
U-Total	1.0E-02	2.8E-04	3.0E-03	9.3E-02	U-Total	1.0E-03		
2-Methylnaphthale					2-Methylnaphthalen			
			Total Pathway:	9.3E-02			Total Pathway:	
			Total Rad + Chem	9.3E-02			Total Rad + Chem	

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TABLE B.3.1-15(c)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				Total
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	5.9E-12	2.9E-04	2.1E-08	6.8E-06
Beryllium	1.1E-13	5.0E-05	2.2E-09	9.9E-09
Lead	1.8E-12			
U-Total	8.0E-07	1.5E-04	5.4E-03	9.9E-02
2-Methylnaphthalen				
Total Pathway:			5.4E-03	

Total Rad + Chem	5.4E-03	*Total:*	9.9E-02

TABLE B.3.1-15(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
ACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237	2.52E-02	5.3E+01	2.2E-10	1.2E-08	Not applicable
SR-90	5.19E-02	1.1E+02	3.6E-11	3.9E-09	
U-234	2.58E+00	5.4E+03	1.6E-11	8.7E-08	
U-235/236	1.38E-01	2.9E+02	1.6E-11	4.6E-09	
U-238	2.85E+00	6.0E+03	2.8E-11	1.7E-07	
			Total Pathway:	2.7E-07	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
Arsenic	7.46E-08	4.1E-10	1.8E+00	7.2E-10	Arsenic	3.1E-09		
Beryllium	1.40E-09	7.7E-12	4.3E+00	3.3E-11	Beryllium	5.8E-11		
Lead	5.82E-06	3.2E-08			Lead	2.4E-07		
U-Total	1.02E-02	5.6E-05			U-Total	4.2E-04		
2-Methylnaphthalene					2-Methylnaphthalen			
			Total Pathway:	7.5E-10			Total Pathway:	
			Total Rad + Chem	2.8E-07			Total Rad + Chem	

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TABLE B.3.1-15(d)
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				1.2E-08
				3.9E-09
				8.7E-08
				4.6E-09
				1.7E-07
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	8.2E-13	1.8E+00	1.5E-12	7.2E-10
Beryllium	1.5E-14		3.3E-11	6.6E-11
Lead	2.6E-13			
U-Total	1.1E-07			
2-Methylnaphthalen				
Total Pathway:			3.4E-11	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 3.4E-11 *Total:* 2.8E-07

TABLE B.3.1-15(d)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	2.5E-02	5.3E+01			Not applicable
SR-90	5.2E-02	1.1E+02			
U-234	2.6E+00	5.4E+03			
U-235/236	1.4E-01	2.9E+02			
U-238	2.9E+00	6.0E+03			
		Total Pathway:			Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic	7.5E-08	4.8E-09	3.0E-04	1.6E-05	Arsenic	3.6E-08		
Beryllium	1.4E-09	8.9E-11	5.0E-03	1.8E-08	Beryllium	6.7E-10		
Lead	5.8E-06	3.7E-07			Lead	2.8E-06		
U-Total	1.0E-02	6.5E-04	3.0E-03	2.2E-01	U-Total	4.9E-03		
2-Methylnaphthale					2-Methylnaphthalen			
			Total Pathway:	2.2E-01				Total Pathway:
			Total Rad + Chem	2.2E-01				Total Rad + Chem

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TABLE B.3.1-15(d)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	

Total Pathway:

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	9.5E-12	2.9E-04	3.3E-08	1.6E-05
Beryllium	1.8E-13	5.0E-05	3.6E-09	2.1E-08
Lead	3.0E-12			
U-Total	1.3E-06	1.5E-04	8.7E-03	2.3E-01
2-Methylnaphthalene				
		Total Pathway:	8.7E-03	

Total Rad + Chem 8.7E-03 *Total:* 2.3E-01

TABLE B.3.1-16
FUTURE, EXPANDED TRESPASSER
ACTIVE FLYASH PILE: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	9.47E-06	3.1E-02	1.9E-11	5.9E-13
NP-237	5.67E-05	1.8E-01	2.9E-08	5.3E-09
PU-238	7.21E-06	2.3E-02	3.9E-08	9.1E-10
PU-239/240	3.30E-06	1.1E-02	3.8E-08	4.1E-10
RA-226	4.74E-05	1.5E-01	7.0E-09	1.1E-09
RA-228	3.30E-05	1.1E-01	6.9E-10	7.4E-11
SR-90	4.64E-05	1.5E-01	6.2E-11	9.4E-12
TH-228	3.91E-05	1.3E-01	7.8E-08	9.9E-09
TH-230	3.66E-05	1.2E-01	2.9E-08	3.5E-09
TH-232	2.78E-05	9.0E-02	1.1E-07	9.9E-09
U-234	3.71E-05	1.2E-01	2.6E-08	3.1E-09
U-235/236	1.65E-06	5.4E-03	2.5E-08	1.3E-10
U-238	3.71E-05	1.2E-01	5.2E-08	6.3E-09
			Total Pathway:	4.1E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.92	3.0E+01	2.8E-11	8.4E-10
NP-237	5.48	1.8E+02	2.2E-10	3.9E-08
PU-238	0.72	2.3E+01	2.2E-10	5.2E-09
PU-239/240	0.33	1.1E+01	2.3E-10	2.5E-09
RA-226	4.61	1.5E+02	7.8E-10	1.2E-07
RA-228	3.17	1.0E+02	1.0E-10	1.0E-08
SR-90	4.47	1.5E+02	3.6E-11	5.2E-09
TH-228	3.81	1.2E+02	5.5E-11	6.8E-09
TH-230	3.55	1.2E+02	1.3E-11	1.5E-09
TH-232	2.67	8.7E+01	1.7E-10	1.5E-08
U-234	3.60	1.2E+02	1.6E-11	1.9E-09
U-235/236	0.16	5.2E+00	1.6E-11	8.3E-11
U-238	3.606	1.2E+02	2.8E-11	3.3E-09
			Total Pathway:	2.1E-07

Chemical Risk

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Arsenic	9.25E-07	2.4E-09	1.5E+01	3.6E-08
Beryllium	4.84E-08	1.3E-10	8.4E+00	1.1E-09
Lead	5.71E-07	1.5E-09		
Thallium	2.78E-08	7.2E-11		
TH-TOTAL	2.53E-07	6.5E-10		
2-Methylnaphthalene	5.77E-10	1.5E-12		
Benzo(a)anthracene	1.13E-09	2.9E-12	6.1E-01	1.8E-12
Benzo(a)pyrene	1.24E-09	3.2E-12	6.1E+00	2.0E-11
Benzo(b)fluoranthene	1.85E-09	4.8E-12	6.1E-01	2.9E-12
Phenanthrene	2.16E-09	5.6E-12		
			Total Pathway:	3.7E-08
			Total Rad + Chem	7.8E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	89.82	2.2E-06	1.8E+00	3.8E-06
Beryllium	4.67	1.1E-07	4.3E+00	4.8E-07
Lead	55.44	1.3E-06		
Thallium	2.66	6.4E-08		
TH-TOTAL	24.49	5.9E-07		
2-Methylnaphthalene	0.06	1.3E-09		
Benzo(a)anthracene	0.11	2.6E-09	7.3E-01	1.9E-09
Benzo(a)pyrene	0.12	2.9E-09	7.3E+00	2.1E-08
Benzo(b)fluoranthene	0.18	4.3E-09	7.3E-01	3.1E-09
Phenanthrene	0.21	5.0E-09		
			Total Pathway:	4.3E-06
			Total Rad + Chem	4.5E-06

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TABLE B.3.1-16
(continued)

CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil				External Radiation/Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable (1)				CS-137	4.1E-01	2.0E-06	8.2E-07	8.2E-07
				NP-237	2.5E+00	4.3E-07	1.1E-06	1.1E-06
				PU-238	3.2E-01	2.8E-11	9.0E-12	6.1E-09
				PU-239/240	1.5E-01	2.7E-11	4.0E-12	2.9E-09
				RA-226	2.1E+00	6.0E-06	1.2E-05	1.2E-05
				RA-228	1.4E+00	2.9E-06	4.1E-06	4.1E-06
				SR-90	2.0E+00			5.2E-09
				TH-228	1.7E+00	5.6E-06	9.5E-06	9.6E-06
				TH-230	1.6E+00	5.4E-11	8.6E-11	5.0E-09
				TH-232	1.2E+00	8.5E-06	1.0E-05	1.0E-05
				U-234	1.6E+00	3.0E-11	4.8E-11	5.1E-09
				U-235/236	7.2E-02	2.4E-07	1.7E-08	1.7E-08
				U-238	1.6E+00	3.6E-08	5.8E-08	6.8E-08
Total Pathway:				Total Pathway:			3.8E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Arsenic	8.2E-07	1.8E+00	1.5E-06					5.3E-06
Beryllium			4.8E-07					9.6E-07
Lead	5.1E-06							
Thallium	2.4E-07			Not applicable				
TH-TOTAL								
2-Methylnaphthalene	1.5E-07							
Benzo(a)anthracene			1.9E-09					3.9E-09
Benzo(a)pyrene			2.1E-08					4.2E-08
Benzo(b)fluoranthene			3.1E-09					6.3E-09
Phenanthrene	5.8E-07							
Total Pathway:			2.0E-06	Total Pathway:				

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.0E-06 3.8E-05 *Total:* 4.5E-05

TABLE B.3.1-16
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3	Intake	RfD(i)	HQ
CS-137	9.47E-06	3.1E-02		
NP-237	5.67E-05	1.8E-01		
PU-238	7.21E-06	2.3E-02		
PU-239/240	3.30E-06	1.1E-02		
RA-226	4.74E-05	1.5E-01		
RA-228	3.30E-05	1.1E-01		
SR-90	4.64E-05	1.5E-01		
TH-228	3.91E-05	1.3E-01		
TH-230	3.66E-05	1.2E-01		
TH-232	2.78E-05	9.0E-02		
U-234	3.71E-05	1.2E-01		
U-235/236	1.65E-06	5.4E-03		
U-238	3.71E-05	1.2E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	HQ
CS-137	0.92	3.0E+01		
NP-237	5.48	1.8E+02		
PU-238	0.72	2.3E+01		
PU-239/240	0.33	1.1E+01		
RA-226	4.61	1.5E+02		
RA-228	3.17	1.0E+02		
SR-90	4.47	1.5E+02		
TH-228	3.81	1.2E+02		
TH-230	3.55	1.2E+02		
TH-232	2.67	8.7E+01		
U-234	3.60	1.2E+02		
U-235/236	0.16	5.2E+00		
U-238	3.61	1.2E+02		

Total Pathway:

Chemical Hazard

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	HQ
Arsenic	9.25E-07	3.8E-09		
Beryllium	4.84E-08	2.0E-10		
Lead	5.71E-07	2.4E-09		
Thallium	2.78E-08	1.1E-10		
TH-TOTAL	2.53E-07	1.0E-09		
2-Methylnaphthalene	5.77E-10	2.4E-12		
Benzo(a)anthracene	1.13E-09	4.7E-12		
Benzo(a)pyrene	1.24E-09	5.1E-12		
Benzo(b)fluoranthene	1.85E-09	7.6E-12		
Phenanthrene	2.16E-09	8.9E-12		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	HQ
Arsenic	89.82	3.4E-06	3.0E-04	1.1E-02
Beryllium	4.67	1.8E-07	5.0E-03	3.6E-05
Lead	55.44	2.1E-06		
Thallium	2.66	1.0E-07	7.0E-05	1.4E-03
TH-TOTAL	24.49	9.3E-07		
2-Methylnaphthalene	0.06	2.1E-09		
Benzo(a)anthracene	0.11	4.2E-09		
Benzo(a)pyrene	0.12	4.6E-09		
Benzo(b)fluoranthene	0.18	6.9E-09		
Phenanthrene	0.21	8.0E-09		

Total Pathway: 1.3E-02

Total Rad + Chem

Total Rad + Chem 1.3E-02

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TABLE B.3.1-16
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	HQ
Not applicable	CS-137	4.1E-01		
	NP-237	2.5E+00		
	PU-238	3.2E-01		
	PU-239/240	1.5E-01		
	RA-226	2.1E+00		
	RA-228	1.4E+00		
	SR-90	2.0E+00		
	TH-228	1.7E+00		
	TH-230	1.6E+00		
	TH-232	1.2E+00		
	U-234	1.6E+00		
	U-235/236	7.2E-02		
	U-238	1.6E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	HQ	Compound	Intake	RfD(o)	HQ	
Arsenic	1.3E-06	2.9E-04	4.6E-03					1.6E-02
Beryllium	6.8E-07	5.0E-05	1.4E-02					1.4E-02
Lead	8.1E-06							
Thallium	3.9E-07	7.0E-05	5.5E-03					7.0E-03
TH-TOTAL				Not applicable				
2-Methylnaphthalen	2.4E-07							
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthen								
Phenanthrene	9.2E-07							
Total Pathway:			2.4E-02	Total Pathway:				
Total Rad + Chem			2.4E-02	Total Rad + Chem				***Total:*** 3.7E-02

TABLE B.3.1-17(a)
FUTURE, EXPANDED TRESPASSER
ACTIVE FLYASH PILE: SURFACE WATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	2.51E+01	5.5E+02	2.2E-10	1.2E-07		1.2E-07
PU-238	1.70E-01	3.7E+00	2.2E-10	8.2E-10	Not applicable	8.2E-10
PU-239/240	7.79E-02	1.7E+00	2.3E-10	3.9E-10		3.9E-10
RA-226	1.02E+00	2.2E+01	7.8E-10	1.7E-08		1.7E-08
RA-228	7.08E-01	1.5E+01	1.0E-10	1.5E-09		1.5E-09
SR-90	9.94E-01	2.2E+01	3.6E-11	7.8E-10		7.8E-10
U-234	5.14E+01	1.1E+03	1.6E-11	1.8E-08		1.8E-08
U-235/236	2.29E+00	5.0E+01	1.6E-11	8.0E-10		8.0E-10
U-238	5.13E+01	1.1E+03	2.8E-11	3.1E-08		3.1E-08
			Total Pathway:	1.9E-07	Total Pathway: 0.0E+00	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	1.06E-02	2.1E-07	1.8E+00	3.7E-07	Arsenic	3.1E-08	1.8E+00	5.7E-08	4.3E-07
Beryllium	4.41E-04	8.8E-09	4.3E+00	3.8E-08	Beryllium			3.8E-08	7.5E-08
Lead	3.40E-02	6.8E-07			Lead	4.0E-10			
			Total Pathway:	4.1E-07			Total Pathway:	9.5E-08	

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 6.0E-07 | Total Rad + Chem 9.5E-08 | *Total:* 6.9E-07

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TABLE B.3.1-17(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	2.51E+01	5.5E+02				
PU-238	1.70E-01	3.7E+00				
PU-239/240	7.79E-02	1.7E+00				
RA-226	1.02E+00	2.2E+01				
RA-228	7.08E-01	1.5E+01				
SR-90	9.94E-01	2.2E+01				
U-234	5.14E+01	1.1E+03				
U-235/236	2.29E+00	5.0E+01				
U-238	5.13E+01	1.1E+03				
			Total Pathway:	0.0E+00	Not applicable	
					Total Pathway: 0.0E+00	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				Total
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	1.06E-02	1.2E-06	3.0E-04	4.1E-03	Arsenic	1.8E-07	2.9E-04	6.3E-04	4.7E-03
Beryllium	4.41E-04	5.1E-08	5.0E-03	1.0E-05	Beryllium	7.5E-09	5.0E-05	1.5E-04	1.6E-04
Lead	3.40E-02	3.9E-06			Lead	2.3E-09			
			Total Pathway:	4.1E-03			Total Pathway:	7.8E-04	
			Total Rad + Chem	4.1E-03			Total Rad + Chem	7.8E-04	*Total:* 4.9E-03

TABLE B.3.1-17(b)
FUTURE, EXPANDED TRESPASSER
ACTIVE FLYASH PILE: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	5.29E+00	2.1E+01	2.2E-10	4.6E-09
PU-238	7.20E-01	2.8E+00	2.2E-10	6.2E-10
PU-239/240	3.30E-01	1.3E+00	2.3E-10	3.0E-10
RA-226	4.60E+00	1.8E+01	7.8E-10	1.4E-08
RA-228	3.18E+00	1.3E+01	1.0E-10	1.3E-09
SR-90	4.47E+00	1.8E+01	3.6E-11	6.3E-10
U-234	3.22E+00	1.3E+01	1.6E-11	2.0E-10
U-235/236	1.43E-01	5.6E-01	1.6E-11	9.0E-12
U-238	3.22E+00	1.3E+01	2.8E-11	3.5E-10

Total Pathway: 2.2E-08

Dermal Contact/Sediment

Not applicable

Total Pathway:

External RadiationSediment

Compound	Intake	SF(e)	Risk	
NP-237	3.8E-01	4.3E-07	1.6E-07	1.7E-07
PU-238	5.1E-02	2.8E-11	1.4E-12	6.2E-10
PU-239/240	2.4E-02	2.7E-11	6.3E-13	3.0E-10
RA-226	3.3E-01	6.0E-06	2.0E-06	2.0E-06
RA-228	2.3E-01	2.9E-06	6.6E-07	6.6E-07
SR-90	3.2E-01			6.3E-10
U-234	2.3E-01	3.0E-11	6.9E-12	2.1E-10
U-235/236	1.0E-02	2.4E-07	2.4E-09	2.5E-09
U-238	2.3E-01	3.6E-08	8.3E-09	8.6E-09

Total Pathway: 2.8E-06

Chemical Risk

Ingestion/Sediment

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	
Arsenic	8.97E+01	3.2E-07	1.8E+00	5.6E-07	1.0E-06
Beryllium	4.67E+00	1.7E-08	4.3E+00	7.2E-08	1.4E-07
Lead	5.48E+01	2.0E-07			

Total Pathway: 6.3E-07

Dermal Contact/Sediment

Compound	Intake	SF(derm)	Risk
Arsenic	2.6E-07	1.8E+00	4.8E-07
Beryllium			7.2E-08
Lead	1.6E-06		

Total Pathway: 5.5E-07

Chemical Risk

External RadiationSediment

Compound	Intake	SF(e)	Risk

Not Applicable

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem	6.6E-07	Total Rad + Chem	5.5E-07	Total Rad + Chem	2.8E-06	*Total:*	4.0E-06

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TABLE B.3.1-17(b)

(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment				
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	5.29E+00	2.1E+01		
PU-238	7.20E-01	2.8E+00		
PU-239/240	3.30E-01	1.3E+00		
RA-226	4.60E+00	1.8E+01		
RA-228	3.18E+00	1.3E+01		
SR-90	4.47E+00	1.8E+01		
U-234	3.22E+00	1.3E+01		
U-235/236	1.43E-01	5.6E-01		
U-238	3.22E+00	1.3E+01		

Total Pathway:

Dermal Contact/Sediment
Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Sediment				
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	8.97E+01	1.9E-06	3.0E-04	6.2E-03
Beryllium	4.67E+00	9.7E-08	5.0E-03	1.9E-05
Lead	5.48E+01	1.1E-06		

Total Pathway: 6.3E-03

Dermal Contact/Sediment				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	1.5E-06	2.9E-04	5.3E-03	1.2E-02
Beryllium	7.9E-07	5.0E-05	1.6E-02	1.6E-02
Lead	9.3E-06			

Total Pathway: 2.1E-02

Total Rad + Chem 6.3E-03

Total Rad + Chem 2.1E-02 *Total:* 2.7E-02

TABLE B.3.1-18(a)

FUTURE ON-PROPERTY FARMER (RME VALUES)

ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
	Inhalation/Soil				Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.91E-06	8.0E-01	1.9E-11	1.5E-11	1.5E-11
NP-237	4.13E-05	4.8E+00	2.9E-08	1.4E-07	1.4E-07
PU-238	5.25E-06	6.1E-01	3.9E-08	2.4E-08	2.4E-08
PU-239/240	2.48E-06	2.9E-01	3.8E-08	1.1E-08	1.1E-08
RA-226	3.45E-05	4.0E+00	7.0E-09	2.8E-08	2.8E-08
RA-228	2.40E-05	2.8E+00	6.9E-10	1.9E-09	1.9E-09
SR-90	3.38E-05	3.9E+00	6.2E-11	2.4E-10	2.4E-10
TH-228	2.85E-05	3.3E+00	7.8E-08	2.6E-07	2.6E-07
TH-230	2.67E-05	3.1E+00	2.9E-08	9.0E-08	9.0E-08
TH-232	2.03E-05	2.4E+00	1.1E-07	2.6E-07	2.6E-07
U-234	2.70E-05	3.1E+00	2.6E-08	8.1E-08	8.1E-08
U-235/236	1.20E-06	1.4E-01	2.5E-08	3.5E-09	3.5E-09
U-238	2.70E-05	3.1E+00	5.2E-08	1.6E-07	1.6E-07
			Total Pathway:	1.1E-06	

Chemical Risk					
	Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.74E-07	4.4E-08	1.5E+01	6.6E-07	6.6E-07
Beryllium	3.53E-08	2.3E-09	8.4E+00	1.9E-08	1.9E-08
Lead	4.16E-07	2.7E-08			
Thallium	2.03E-08	1.3E-09			
TH-TOTAL	1.84E-07	1.2E-08			
2-Methylnaphthalene	4.21E-10	2.7E-11			
Benzo(a)anthracene	8.27E-10	5.4E-11	6.1E-01	3.3E-11	3.3E-11
Benzo(a)pyrene	9.02E-10	5.8E-11	6.1E+00	3.6E-10	3.6E-10
Benzo(b)fluoranthene	1.35E-09	8.7E-11	6.1E-01	5.3E-11	5.3E-11
Phenanthrene	1.58E-09	1.0E-10			
			Total Pathway:	6.7E-07	

Total Rad + Chem 1.7E-06 | *Total:* 1.7E-06

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TABLE B.3.1-18(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Inhalation/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	6.91E-06	8.0E-01		
NP-237	4.13E-05	4.8E+00		
PU-238	5.25E-06	6.1E-01		
PU-239/240	2.48E-06	2.9E-01		
RA-226	3.45E-05	4.0E+00		
RA-228	2.40E-05	2.8E+00		
SR-90	3.38E-05	3.9E+00		
TH-228	2.85E-05	3.3E+00		
TH-230	2.67E-05	3.1E+00		
TH-232	2.03E-05	2.4E+00		
U-234	2.70E-05	3.1E+00		
U-235/236	1.20E-06	1.4E-01		
U-238	2.70E-05	3.1E+00		

Total Pathway:

Total

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.74E-07	4.4E-08		
Beryllium	3.53E-08	2.3E-09		
Lead	4.16E-07	2.7E-08		
Thallium	2.03E-08	1.3E-09		
TH-TOTAL	1.84E-07	1.2E-08		
2-Methylnaphthalene	4.21E-10	2.7E-11		
Benzo(a)anthracene	8.27E-10	5.4E-11		
Benzo(a)pyrene	9.02E-10	5.8E-11		
Benzo(b)fluoranthene	1.35E-09	8.7E-11		
Phenanthrene	1.58E-09	1.0E-10		

Total Pathway:

Total Rad + Chem

Total:

TABLE B.3.1-18(b)

FUTURE ON-PROPERTY CHILD

ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.91E-06	1.5E-02	1.9E-11	2.8E-13	2.8E-13
NP-237	4.13E-05	8.7E-02	2.9E-08	2.5E-09	2.5E-09
PU-238	5.25E-06	1.1E-02	3.9E-08	4.3E-10	4.3E-10
PU-239/240	2.48E-06	5.2E-03	3.8E-08	2.0E-10	2.0E-10
RA-226	3.45E-05	7.2E-02	7.0E-09	5.1E-10	5.1E-10
RA-228	2.40E-05	5.0E-02	6.9E-10	3.5E-11	3.5E-11
SR-90	3.38E-05	7.1E-02	6.2E-11	4.4E-12	4.4E-12
TH-228	2.85E-05	6.0E-02	7.8E-08	4.7E-09	4.7E-09
TH-230	2.67E-05	5.6E-02	2.9E-08	1.6E-09	1.6E-09
TH-232	2.03E-05	4.3E-02	1.1E-07	4.7E-09	4.7E-09
U-234	2.70E-05	5.7E-02	2.6E-08	1.5E-09	1.5E-09
U-235/236	1.20E-06	2.5E-03	2.5E-08	6.3E-11	6.3E-11
U-238	2.70E-05	5.7E-02	5.2E-08	2.9E-09	2.9E-09
			Total Pathway:	1.9E-08	

Chemical Risk					
Inhalation/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.74E-07	3.7E-09	1.5E+01	5.5E-08	5.5E-08
Beryllium	3.53E-08	1.9E-10	8.4E+00	1.6E-09	1.6E-09
Lead	4.16E-07	2.3E-09			
Thallium	2.03E-08	1.1E-10			
TH-TOTAL	1.84E-07	1.0E-09			
2-Methylnaphthalene	4.21E-10	2.3E-12			
Benzo(a)anthracene	8.27E-10	4.5E-12	6.1E-01	2.8E-12	2.8E-12
Benzo(a)pyrene	9.02E-10	4.9E-12	6.1E+00	3.0E-11	3.0E-11
Benzo(b)fluoranthene	1.35E-09	7.4E-12	6.1E-01	4.5E-12	4.5E-12
Phenanthrene	1.58E-09	8.7E-12			
			Total Pathway:	5.7E-08	

Total Rad + Chem	7.6E-08	*Total:*	7.6E-08

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TABLE B.3.1-18(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Inhalation/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	6.91E-06	1.5E-02		
NP-237	4.13E-05	8.7E-02		
PU-238	5.25E-06	1.1E-02		
PU-239/240	2.48E-06	5.2E-03		
RA-226	3.45E-05	7.2E-02		
RA-228	2.40E-05	5.0E-02		
SR-90	3.38E-05	7.1E-02		
TH-228	2.85E-05	6.0E-02		
TH-230	2.67E-05	5.6E-02		
TH-232	2.03E-05	4.3E-02		
U-234	2.70E-05	5.7E-02		
U-235/236	1.20E-06	2.5E-03		
U-238	2.70E-05	5.7E-02		
		Total Pathway:		

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.74E-07	4.3E-08		
Beryllium	3.53E-08	2.3E-09		
Lead	4.16E-07	2.7E-08		
Thallium	2.03E-08	1.3E-09		
TH-TOTAL	1.84E-07	1.2E-08		
2-Methylnaphthalene	4.21E-10	2.7E-11		
Benzo(a)anthracene	8.27E-10	5.3E-11		
Benzo(a)pyrene	9.02E-10	5.8E-11		
Benzo(b)fluoranthene	1.35E-09	8.6E-11		
Phenanthrene	1.58E-09	1.0E-10		
		Total Pathway:		

Total

Total Rad + Chem | *Total:*

TABLE B.3.1-19(a)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
ACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	3.14E-04	1.5E+01	2.2E-10	3.4E-09
SR-90	5.47E-01	2.7E+04	3.6E-11	9.6E-07
U-234	1.98E+01	9.7E+05	1.6E-11	1.6E-05
U-235/236	1.05E+00	5.1E+04	1.6E-11	8.2E-07
U-238	2.18E+01	1.1E+06	2.8E-11	3.0E-05
			Total Pathway:	4.7E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	1.84E-13	5.0E-15	1.8E+00	8.8E-15
Beryllium	1.82E-15	5.0E-17	4.3E+00	2.1E-16
Lead	2.06E-09	5.6E-11		
U-Total	7.76E-02	2.1E-03		
2-Methylnaphthalen	1.95E-03	5.3E-05		
			Total Pathway:	9.0E-15
			Total Rad + Chem	4.7E-05

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Arsenic	1.9E-14		
Beryllium	1.9E-16		
Lead	2.1E-10		
U-Total	8.0E-03		
2-Methylnaphthalen	2.0E-04		

Total Pathway:

Total Rad + Chem

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TABLE B.3.1-19(a)
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				Total
Not applicable				3.4E-09
				9.6E-07
				1.6E-05
				8.2E-07
				3.0E-05
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	1.4E-17	1.8E+00	2.7E-17	8.8E-15
Beryllium			2.1E-16	4.3E-16
Lead	6.5E-16			
U-Total	6.1E-06			
2-Methylnaphthalene				
		Total Pathway:	2.4E-16	

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.4E-16 *Total:* 4.7E-05

TABLE B.3.1-19(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	3.1E-04	1.5E+01			Not applicable
SR-90	5.5E-01	2.7E+04			
U-234	2.0E+01	9.7E+05			
U-235/236	1.1E+00	5.1E+04			
U-238	2.2E+01	1.1E+06			
Total Pathway:					Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic	1.8E-13	5.0E-15	3.0E-04	1.7E-11	Arsenic	1.9E-14		
Beryllium	1.8E-15	5.0E-17	5.0E-03	1.0E-14	Beryllium	1.9E-16		
Lead	2.1E-09	5.6E-11			Lead	2.1E-10		
U-Total	7.8E-02	2.1E-03	3.0E-03	7.1E-01	U-Total	8.0E-03		
2-Methylnaphthale	2.0E-03	5.3E-05			2-Methylnaphthalen	2.0E-04		
		Total Pathway:		7.1E-01			Total Pathway:	
		Total Rad + Chem		7.1E-01			Total Rad + Chem	

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TABLE B.3.1-19(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	1.4E-17	2.9E-04	5.1E-14	1.7E-11
Beryllium	1.4E-19	5.0E-05	2.9E-15	1.3E-14
Lead	6.5E-16			
U-Total	6.1E-06	1.5E-04	4.1E-02	7.5E-01
2-Methylnaphthalen	1.5E-07			
		Total Pathway:	4.1E-02	
		Total Rad + Chem	4.1E-02	*Total:* 7.5E-01

TABLE B.3.1-19(b)
FUTURE, ON-PROPERTY CHILD
ACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	3.14E-04	6.6E-01	2.2E-10	1.5E-10
SR-90	5.47E-01	1.1E+03	3.6E-11	4.1E-08
U-234	1.98E+01	4.2E+04	1.6E-11	6.7E-07
U-235/236	1.05E+00	2.2E+03	1.6E-11	3.5E-08
U-238	2.18E+01	4.6E+04	2.8E-11	1.3E-06

Total Pathway: 2.0E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	1.84E-13	1.0E-15	1.8E+00	1.8E-15
Beryllium	1.82E-15	1.0E-17	4.3E+00	4.3E-17
Lead	2.06E-09	1.1E-11		
U-Total	7.76E-02	4.3E-04		
2-Methylnaphthalene	1.95E-03	1.1E-05		

Total Pathway: 1.8E-15

Total Rad + Chem 2.0E-06

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Arsenic	7.6E-15		
Beryllium	7.5E-17		
Lead	8.5E-11		
U-Total	3.2E-03		
2-Methylnaphthalene	8.0E-05		

Total Pathway:

Total Rad + Chem

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TABLE B.3.1-19(b)
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				1.5E-10
				4.1E-08
				6.7E-07
				3.5E-08
				1.3E-06
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	2.0E-18	1.8E+00	3.7E-18	1.8E-15
Beryllium			4.3E-17	8.6E-17
Lead	9.0E-17			
U-Total	8.5E-07			
2-Methylnaphthalene				
		Total Pathway:	4.7E-17	

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 4.7E-17 *Total:* 2.0E-06

TABLE B.3.1-19(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	3.1E-04	6.6E-01			Not applicable
SR-90	5.5E-01	1.1E+03			
U-234	2.0E+01	4.2E+04			
U-235/236	1.1E+00	2.2E+03			
U-238	2.2E+01	4.6E+04			
		Total Pathway:			Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic	1.8E-13	1.2E-14	3.0E-04	3.9E-11	Arsenic	8.8E-14		
Beryllium	1.8E-15	1.2E-16	5.0E-03	2.3E-14	Beryllium	8.7E-16		
Lead	2.1E-09	1.3E-10			Lead	9.9E-10		
U-Total	7.8E-02	5.0E-03	3.0E-03	1.7E+00	U-Total	3.7E-02		
2-Methylnaphthalene	2.0E-03	1.2E-04			2-Methylnaphthalene	9.3E-04		
			Total Pathway:	1.7E+00			Total Pathway:	
			Total Rad + Chem	1.7E+00			Total Rad + Chem	

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TABLE B.3.1-19(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	2.4E-17	2.9E-04	8.3E-14	3.9E-11
Beryllium	2.3E-19	5.0E-05	4.7E-15	2.8E-14
Lead	1.1E-15			
U-Total	9.9E-06	1.5E-04	6.6E-02	1.7E+00
2-Methylnaphthalene				
		Total Pathway:	6.6E-02	

Total Rad + Chem	6.6E-02	*Total:*	1.7E+00

TABLE B.3.1-20(a)

FUTURE ON-PROPERTY FARMER (RME VALUES)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.77E-06	9.4E+00	2.8E-11	2.6E-10	CS-137	4.76E-06	5.0E+00	2.8E-11	1.4E-10	4.0E-10
NP-237	2.04E-05	4.0E+01	2.2E-10	8.8E-09	NP-237	2.04E-05	2.1E+01	2.2E-10	4.7E-09	1.4E-08
PU-238	2.57E-06	5.1E+00	2.2E-10	1.1E-09	PU-238	2.57E-06	2.7E+00	2.2E-10	5.9E-10	1.7E-09
PU-239/240	1.21E-06	2.4E+00	2.3E-10	5.5E-10	PU-239/240	1.21E-06	1.3E+00	2.3E-10	2.9E-10	8.4E-10
RA-226	1.74E-05	3.4E+01	7.8E-10	2.7E-08	RA-226	1.74E-05	1.8E+01	7.8E-10	1.4E-08	4.1E-08
RA-228	1.18E-05	2.3E+01	1.0E-10	2.3E-09	RA-228	1.17E-05	1.2E+01	1.0E-10	1.2E-09	3.5E-09
SR-90	1.86E-05	3.7E+01	3.6E-11	1.3E-09	SR-90	1.85E-05	1.9E+01	3.6E-11	7.0E-10	2.0E-09
TH-228	1.39E-05	2.7E+01	5.5E-11	1.5E-09	TH-228	1.35E-05	1.4E+01	5.5E-11	7.8E-10	2.3E-09
TH-230	1.33E-05	2.6E+01	1.3E-11	3.4E-10	TH-230	1.33E-05	1.4E+01	1.3E-11	1.8E-10	5.2E-10
TH-232	1.01E-05	2.0E+01	1.7E-10	3.4E-09	TH-232	1.01E-05	1.1E+01	1.7E-10	1.8E-09	5.2E-09
U-234	1.32E-05	2.6E+01	1.6E-11	4.2E-10	U-234	1.32E-05	1.4E+01	1.6E-11	2.2E-10	6.4E-10
U-235/236	5.88E-07	1.2E+00	1.6E-11	1.9E-11	U-235/236	5.88E-07	6.1E-01	1.6E-11	9.8E-12	2.8E-11
U-238	1.32E-05	2.6E+01	2.8E-11	7.3E-10	U-238	1.32E-05	1.4E+01	2.8E-11	3.9E-10	1.1E-09
			Total Pathway:	4.8E-08				Total Pathway:	2.5E-08	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.06E-04	4.5E-07	1.8E+00	7.8E-07	Arsenic	4.06E-04	2.4E-07	1.8E+00	4.1E-07	1.2E-06
Beryllium	1.85E-05	2.0E-08	4.3E+00	8.8E-08	Beryllium	1.85E-05	1.1E-08	4.3E+00	4.6E-08	1.3E-07
Lead	2.17E-04	2.4E-07			Lead	2.17E-04	1.3E-07			
Thallium	1.07E-05	1.2E-08			Thallium	1.07E-05	6.3E-09			
TH-TOTAL	9.20E-05	1.0E-07			TH-TOTAL	9.20E-05	5.4E-08			
2-Methylnaphthalen	7.21E-07	7.9E-10			2-Methylnaphthalene	7.21E-07	4.2E-10			
Benzo(a)anthracene	4.35E-07	4.8E-10	7.3E-01	3.5E-10	Benzo(a)anthracene	4.32E-07	2.5E-10	7.3E-01	1.8E-10	5.3E-10
Benzo(a)pyrene	4.60E-07	5.1E-10	7.3E+00	3.7E-09	Benzo(a)pyrene	4.57E-07	2.7E-10	7.3E+00	1.9E-09	5.6E-09
Benzo(b)fluoranthen	6.84E-07	7.5E-10	7.3E-01	5.5E-10	Benzo(b)fluoranthene	6.78E-07	4.0E-10	7.3E-01	2.9E-10	8.4E-10
Phenanthrene	8.21E-07	9.0E-10			Phenanthrene	8.01E-07	4.7E-10			
			Total Pathway:	8.8E-07				Total Pathway:	4.6E-07	
			Total Rad + Chem	9.2E-07				Total Rad + Chem	4.9E-07	*Total:* 1.4E-06

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TABLE B.3.1-20(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.8E-06	9.4E+00		
NP-237	2.0E-05	4.0E+01		
PU-238	2.6E-06	5.1E+00		
PU-239/240	1.2E-06	2.4E+00		
RA-226	1.7E-05	3.4E+01		
RA-228	1.2E-05	2.3E+01		
SR-90	1.9E-05	3.7E+01		
TH-228	1.4E-05	2.7E+01		
TH-230	1.3E-05	2.6E+01		
TH-232	1.0E-05	2.0E+01		
U-234	1.3E-05	2.6E+01		
U-235/236	5.9E-07	1.2E+00		
U-238	1.3E-05	2.6E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.76E-06	5.0E+00		
NP-237	2.04E-05	2.1E+01		
PU-238	2.57E-06	2.7E+00		
PU-239/240	1.21E-06	1.3E+00		
RA-226	1.74E-05	1.8E+01		
RA-228	1.17E-05	1.2E+01		
SR-90	1.85E-05	1.9E+01		
TH-228	1.35E-05	1.4E+01		
TH-230	1.33E-05	1.4E+01		
TH-232	1.01E-05	1.1E+01		
U-234	1.32E-05	1.4E+01		
U-235/236	5.88E-07	6.1E-01		
U-238	1.32E-05	1.4E+01		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.1E-04	4.5E-07	3.0E-04	1.5E-03
Beryllium	1.9E-05	2.0E-08	5.0E-03	4.1E-06
Lead	2.2E-04	2.4E-07		
Thallium	1.1E-05	1.2E-08	7.0E-05	1.7E-04
TH-TOTAL	9.2E-05	1.0E-07		
2-Methylnaphthalene	7.2E-07	7.9E-10		
Benzo(a)anthracene	4.4E-07	4.8E-10		
Benzo(a)pyrene	4.6E-07	5.1E-10		
Benzo(b)fluoranthene	6.8E-07	7.5E-10		
Phenanthrene	8.2E-07	9.0E-10		

Total Pathway: 1.7E-03

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.06E-04	2.4E-07	3.0E-04	7.9E-04
Beryllium	1.85E-05	1.1E-08	5.0E-03	2.2E-06
Lead	2.17E-04	1.3E-07		
Thallium	1.07E-05	6.3E-09	7.0E-05	8.9E-05
TH-TOTAL	9.20E-05	5.4E-08		
2-Methylnaphthalene	7.21E-07	4.2E-10		
Benzo(a)anthracene	4.32E-07	2.5E-10		
Benzo(a)pyrene	4.57E-07	2.7E-10		
Benzo(b)fluoranthene	6.78E-07	4.0E-10		
Phenanthrene	8.01E-07	4.7E-10		

Total Pathway: 8.8E-04

			2.3E-03
			6.2E-06
			2.6E-04

Total Rad + Chem 1.7E-03

Total Rad + Chem 8.8E-04 *Total:* 2.5E-03

TABLE B.3.1-20(a)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.56E-06	3.1E+00	2.2E-10	6.7E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.78E-03	5.5E+03	7.8E-10	4.3E-06
RA-228			1.0E-10	
SR-90	1.12E-01	2.2E+05	3.6E-11	7.9E-06
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	5.15E-03	1.0E+04	1.6E-11	1.6E-07
U-235/236	1.07E-01	2.1E+05	1.6E-11	3.4E-06
U-238			2.8E-11	

Total Pathway: 1.6E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.56E-06	1.6E+00	2.2E-10	3.6E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.78E-03	2.9E+03	7.8E-10	2.3E-06
RA-228			1.0E-10	
SR-90	1.11E-01	1.2E+05	3.6E-11	4.2E-06
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	5.15E-03	5.4E+03	1.6E-11	8.6E-08
U-235/236	1.07E-01	1.1E+05	1.6E-11	1.8E-06
U-238			2.8E-11	

Total Pathway: 8.3E-06

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	1.3E-15	1.8E+00	2.2E-15
Beryllium	9.71E-15	1.1E-17	4.3E+00	4.6E-17
Lead	1.09E-08	1.2E-11		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	4.2E-04		

Total Pathway: 2.3E-15

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	6.8E-16	1.8E+00	1.2E-15
Beryllium	9.71E-15	5.7E-18	4.3E+00	2.4E-17
Lead	1.09E-08	6.4E-12		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	2.2E-04		

Total Pathway: 1.2E-15

Total Rad + Chem 1.6E-05

Total Rad + Chem 8.3E-06

	Total	Total Dust & Groundwater Affected
CS-137		4.0E-10
NP-237	1.0E-09	1.5E-08
PU-238		1.7E-09
PU-239/240		8.4E-10
RA-226	6.5E-06	6.6E-06
RA-228		3.5E-09
SR-90	1.2E-05	1.2E-05
TH-228		2.3E-09
TH-230		5.2E-10
TH-232		5.2E-09
U-234	2.5E-07	2.5E-07
U-235/236	5.2E-06	5.2E-06
U-238		1.1E-09
Arsenic	3.4E-15	1.2E-06
Beryllium	7.0E-17	1.3E-07
Lead		
Thallium		
TH-TOTAL		
2-Methylnaphthalene		
Benzo(a)anthracene		5.3E-10
Benzo(a)pyrene		5.6E-09
Benzo(b)fluoranthene		8.4E-10
Phenanthrene		
U-Total		
Total:	2.4E-05	2.5E-05

TABLE B.3.1-20(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.6E-06	3.1E+00		
PU-238				
PU-239/240				
RA-226	2.8E-03	5.5E+03		
RA-228				
SR-90	1.1E-01	2.2E+05		
TH-228				
TH-230				
TH-232				
U-234	5.1E-03	1.0E+04		
U-235/236	1.1E-01	2.1E+05		
U-238				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.56E-06	1.6E+00		
PU-238				
PU-239/240				
RA-226	2.78E-03	2.9E+03		
RA-228				
SR-90	1.11E-01	1.2E+05		
TH-228				
TH-230				
TH-232				
U-234	5.15E-03	5.4E+03		
U-235/236	1.07E-01	1.1E+05		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.2E-12	1.3E-15	3.0E-04	4.3E-12
Beryllium	9.7E-15	1.1E-17	5.0E-03	2.1E-15
Lead	1.1E-08	1.2E-11		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.8E-01	4.2E-04	3.0E-03	1.4E-01

Total Pathway: 1.4E-01

Total Rad + Chem 1.4E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.16E-12	6.8E-16	3.0E-04	2.3E-12
Beryllium	9.71E-15	5.7E-18	5.0E-03	1.1E-15
Lead	1.09E-08	6.4E-12		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.80E-01	2.2E-04	3.0E-03	7.4E-02

Total Pathway: 7.4E-02

Total Rad + Chem 7.4E-02

	Total	Total Dust & Groundwater Affected
	6.5E-12	2.3E-03
	3.3E-15	6.2E-06
		2.6E-04
	2.1E-01	2.1E-01
Total:	2.1E-01	2.2E-01

TABLE B.3.1-20(b)

FUTURE ON-PROPERTY CHILD

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.77E-06	4.0E-01	2.8E-11	1.1E-11	CS-137	4.76E-06	6.1E-01	2.8E-11	1.7E-11	2.8E-11
NP-237	2.04E-05	1.7E+00	2.2E-10	3.8E-10	NP-237	2.04E-05	2.6E+00	2.2E-10	5.8E-10	9.5E-10
PU-238	2.57E-06	2.2E-01	2.2E-10	4.7E-11	PU-238	2.57E-06	3.3E-01	2.2E-10	7.3E-11	1.2E-10
PU-239/240	1.21E-06	1.0E-01	2.3E-10	2.3E-11	PU-239/240	1.21E-06	1.6E-01	2.3E-10	3.6E-11	5.9E-11
RA-226	1.74E-05	1.5E+00	7.8E-10	1.1E-09	RA-226	1.74E-05	2.2E+00	7.8E-10	1.7E-09	2.9E-09
RA-228	1.18E-05	9.9E-01	1.0E-10	9.9E-11	RA-228	1.17E-05	1.5E+00	1.0E-10	1.5E-10	2.5E-10
SR-90	1.86E-05	1.6E+00	3.6E-11	5.6E-11	SR-90	1.85E-05	2.4E+00	3.6E-11	8.6E-11	1.4E-10
TH-228	1.39E-05	1.2E+00	5.5E-11	6.4E-11	TH-228	1.35E-05	1.7E+00	5.5E-11	9.6E-11	1.6E-10
TH-230	1.33E-05	1.1E+00	1.3E-11	1.5E-11	TH-230	1.33E-05	1.7E+00	1.3E-11	2.2E-11	3.7E-11
TH-232	1.01E-05	8.5E-01	1.7E-10	1.4E-10	TH-232	1.01E-05	1.3E+00	1.7E-10	2.2E-10	3.7E-10
U-234	1.32E-05	1.1E+00	1.6E-11	1.8E-11	U-234	1.32E-05	1.7E+00	1.6E-11	2.7E-11	4.5E-11
U-235/236	5.88E-07	4.9E-02	1.6E-11	7.9E-13	U-235/236	5.88E-07	7.6E-02	1.6E-11	1.2E-12	2.0E-12
U-238	1.32E-05	1.1E+00	2.8E-11	3.1E-11	U-238	1.32E-05	1.7E+00	2.8E-11	4.8E-11	7.9E-11
			Total Pathway:	2.0E-09				Total Pathway:	3.1E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.06E-04	8.9E-08	1.8E+00	1.6E-07	Arsenic	4.06E-04	1.4E-07	1.8E+00	2.4E-07	3.9E-07
Beryllium	1.85E-05	4.1E-09	4.3E+00	1.7E-08	Beryllium	1.85E-05	6.2E-09	4.3E+00	2.7E-08	4.4E-08
Lead	2.17E-04	4.8E-08			Lead	2.17E-04	7.3E-08			
Thallium	1.07E-05	2.3E-09			Thallium	1.07E-05	3.6E-09			
TH-TOTAL	9.20E-05	2.0E-08			TH-TOTAL	9.20E-05	3.1E-08			
2-Methylnaphthálen	7.21E-07	1.6E-10			2-Methylnaphthalene	7.21E-07	2.4E-10			
Benzo(a)anthracene	4.35E-07	9.5E-11	7.3E-01	7.0E-11	Benzo(a)anthracene	4.32E-07	1.4E-10	7.3E-01	1.1E-10	1.8E-10
Benzo(a)pyrene	4.60E-07	1.0E-10	7.3E+00	7.4E-10	Benzo(a)pyrene	4.57E-07	1.5E-10	7.3E+00	1.1E-09	1.9E-09
Benzo(b)fluoranthen	6.84E-07	1.5E-10	7.3E-01	1.1E-10	Benzo(b)fluoranthene	6.78E-07	2.3E-10	7.3E-01	1.7E-10	2.8E-10
Phenanthrene	8.21E-07	1.8E-10			Phenanthrene	8.01E-07	2.7E-10			
			Total Pathway:	1.7E-07				Total Pathway:	2.7E-07	
			Total Rad + Chem	1.8E-07				Total Rad + Chem	2.7E-07	*Total:* 4.5E-07

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TABLE B.3.1-20(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	4.8E-06	4.0E-01			CS-137	4.76E-06	6.1E-01			
NP-237	2.0E-05	1.7E+00			NP-237	2.04E-05	2.6E+00			
PU-238	2.6E-06	2.2E-01			PU-238	2.57E-06	3.3E-01			
PU-239/240	1.2E-06	1.0E-01			PU-239/240	1.21E-06	1.6E-01			
RA-226	1.7E-05	1.5E+00			RA-226	1.74E-05	2.2E+00			
RA-228	1.2E-05	9.9E-01			RA-228	1.17E-05	1.5E+00			
SR-90	1.9E-05	1.6E+00			SR-90	1.85E-05	2.4E+00			
TH-228	1.4E-05	1.2E+00			TH-228	1.35E-05	1.7E+00			
TH-230	1.3E-05	1.1E+00			TH-230	1.33E-05	1.7E+00			
TH-232	1.0E-05	8.5E-01			TH-232	1.01E-05	1.3E+00			
U-234	1.3E-05	1.1E+00			U-234	1.32E-05	1.7E+00			
U-235/236	5.9E-07	4.9E-02			U-235/236	5.88E-07	7.6E-02			
U-238	1.3E-05	1.1E+00			U-238	1.32E-05	1.7E+00			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	4.1E-04	1.0E-06	3.0E-04	3.5E-03	Arsenic	4.06E-04	1.6E-06	3.0E-04	5.3E-03	8.8E-03
Beryllium	1.9E-05	4.7E-08	5.0E-03	9.5E-06	Beryllium	1.85E-05	7.2E-08	5.0E-03	1.4E-05	2.4E-05
Lead	2.2E-04	5.5E-07			Lead	2.17E-04	8.5E-07			
Thallium	1.1E-05	2.7E-08	7.0E-05	3.9E-04	Thallium	1.07E-05	4.2E-08	7.0E-05	6.0E-04	9.9E-04
TH-TOTAL	9.2E-05	2.4E-07			TH-TOTAL	9.20E-05	3.6E-07			
2-Methylnaphthalene	7.2E-07	1.8E-09			2-Methylnaphthalene	7.21E-07	2.8E-09			
Benzo(a)anthracene	4.4E-07	1.1E-09			Benzo(a)anthracene	4.32E-07	1.7E-09			
Benzo(a)pyrene	4.6E-07	1.2E-09			Benzo(a)pyrene	4.57E-07	1.8E-09			
Benzo(b)fluoranthene	6.8E-07	1.7E-09			Benzo(b)fluoranthene	6.78E-07	2.7E-09			
Phenanthrene	8.2E-07	2.1E-09			Phenanthrene	8.01E-07	3.1E-09			
			Total Pathway:	3.9E-03				Total Pathway:	5.9E-03	
			Total Rad + Chem	3.9E-03				Total Rad + Chem	5.9E-03	*Total:* 9.8E-03

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TABLE B.3.1-20(b)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.56E-06	1.3E-01	2.2E-10	2.9E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.78E-03	2.3E+02	7.8E-10	1.8E-07
RA-228			1.0E-10	
SR-90	1.12E-01	9.4E+03	3.6E-11	3.4E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	5.15E-03	4.3E+02	1.6E-11	6.9E-09
U-235/236	1.07E-01	9.0E+03	1.6E-11	1.4E-07
U-238			2.8E-11	

Total Pathway: 6.7E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.56E-06	2.0E-01	2.2E-10	4.4E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	2.78E-03	3.6E+02	7.8E-10	2.8E-07
RA-228			1.0E-10	
SR-90	1.11E-01	1.4E+04	3.6E-11	5.2E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	5.15E-03	6.6E+02	1.6E-11	1.1E-08
U-235/236	1.07E-01	1.4E+04	1.6E-11	2.2E-07
U-238			2.8E-11	

Total Pathway: 1.0E-06

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	2.5E-16	1.8E+00	4.5E-16
Beryllium	9.71E-15	2.1E-18	4.3E+00	9.2E-18
Lead	1.09E-08	2.4E-12		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	8.3E-05		

Total Pathway: 4.5E-16

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.16E-12	3.9E-16	1.8E+00	6.8E-16
Beryllium	9.71E-15	3.3E-18	4.3E+00	1.4E-17
Lead	1.09E-08	3.7E-12		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Phenanthrene				
U-Total	3.80E-01	1.3E-04		

Total Pathway: 7.0E-16

Total Rad + Chem 6.7E-07

Total Rad + Chem 1.0E-06

	Total	Total Dust & Groundwater Affected
		2.8E-11
	7.3E-11	1.0E-09
		1.2E-10
		5.9E-11
	4.6E-07	4.6E-07
		2.5E-10
	8.5E-07	8.5E-07
		1.6E-10
		3.7E-11
		3.7E-10
	1.7E-08	1.8E-08
	3.6E-07	3.6E-07
		7.9E-11
	1.1E-15	3.9E-07
	2.3E-17	4.4E-08
		1.8E-10
		1.9E-09
		2.8E-10
Total:	1.7E-06	2.1E-06

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TABLE B.3.1-20(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.6E-06			
PU-238				
PU-239/240				
RA-226	2.8E-03			
RA-228				
SR-90	1.1E-01			
TH-228				
TH-230				
TH-232				
U-234	5.1E-03			
U-235/236	1.1E-01			
U-238				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.56E-06			
PU-238				
PU-239/240				
RA-226	2.78E-03			
RA-228				
SR-90	1.11E-01			
TH-228				
TH-230				
TH-232				
U-234	5.15E-03			
U-235/236	1.07E-01			
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.2E-12	3.0E-15	3.0E-04	9.9E-12
Beryllium	9.7E-15	2.5E-17	5.0E-03	5.0E-15
Lead	1.1E-08	2.8E-11		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.8E-01	9.7E-04	3.0E-03	3.2E-01

Total Pathway: 3.2E-01

Total Rad + Chem 3.2E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.16E-12	4.5E-15	3.0E-04	1.5E-11
Beryllium	9.71E-15	3.8E-17	5.0E-03	7.6E-15
Lead	1.09E-08	4.3E-11		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.80E-01	1.5E-03	3.0E-03	5.0E-01

Total Pathway: 5.0E-01

Total Rad + Chem 5.0E-01

	Total	Total Dust & Groundwater Affected
	2.5E-11	8.8E-03
	1.3E-14	2.4E-05
		9.9E-04
	8.2E-01	8.2E-01
Total:	8.2E-01	8.3E-01

TABLE B.3.1-21(a)

FUTURE ON-PROPERTY FARMER (RME VALUES)

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137	1.56E-02	2.9E+01	2.8E-11	8.0E-10
NP-237	1.12E-04	2.0E-01	2.2E-10	4.5E-11
PU-238	1.33E-07	2.4E-04	2.2E-10	5.4E-14
PU-239/240	6.75E-08	1.2E-04	2.3E-10	2.9E-14
RA-226	6.16E-04	1.1E+00	7.8E-10	8.8E-10
RA-228	2.72E-04	5.0E-01	1.0E-10	5.0E-11
SR-90	1.14E-03	2.1E+00	3.6E-11	7.5E-11
TH-228	6.94E-06	1.3E-02	5.5E-11	7.0E-13
TH-230	3.22E-05	5.9E-02	1.3E-11	7.7E-13
TH-232	2.46E-05	4.5E-02	1.7E-10	7.7E-12
U-234	2.33E-04	4.3E-01	1.6E-11	6.9E-12
U-235/236	1.04E-05	1.9E-02	1.6E-11	3.0E-13
U-238	2.33E-04	4.3E-01	2.8E-11	1.2E-11
			Total Pathway:	1.9E-09

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
CS-137	5.46E-03	4.0E+01	2.8E-11	1.1E-09
NP-237	1.01E-05	7.5E-02	2.2E-10	1.6E-11
PU-238	2.66E-08	2.0E-04	2.2E-10	4.3E-14
PU-239/240	1.35E-08	9.9E-05	2.3E-10	2.3E-14
RA-226	1.11E-03	8.1E+00	7.8E-10	6.4E-09
RA-228	4.93E-04	3.6E+00	1.0E-10	3.6E-10
SR-90	5.70E-03	4.2E+01	3.6E-11	1.5E-09
TH-228	5.90E-06	4.3E-02	5.5E-11	2.4E-12
TH-230	2.69E-05	2.0E-01	1.3E-11	2.6E-12
TH-232	2.05E-05	1.5E-01	1.7E-10	2.6E-11
U-234	7.00E-04	5.1E+00	1.6E-11	8.2E-11
U-235/236	3.11E-05	2.3E-01	1.6E-11	3.7E-12
U-238	7.00E-04	5.1E+00	2.8E-11	1.4E-10
			Total Pathway:	9.6E-09

Total
1.9E-09
6.1E-11
9.7E-14
5.1E-14
7.2E-09
4.1E-10
1.6E-09
3.1E-12
3.3E-12
3.3E-11
8.9E-11
4.0E-12
1.6E-10

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.07E-04	2.1E-07	1.75E+00	3.7E-07
Beryllium	3.46E-06	3.6E-09	4.30E+00	1.5E-08
Lead	8.24E-06	8.5E-09		
Thallium	1.63E-04	1.7E-07		
TH-TOTAL	2.23E-07	2.3E-10		
2-Methylnaphthalene	1.47E-08	1.5E-11		
Benzo(a)anthracene	4.61E-07	4.7E-10	7.30E-01	3.5E-10
Benzo(a)pyrene	1.33E-06	1.4E-09	7.30E+00	1.0E-08
Benzo(b)fluoranthen	2.05E-06	2.1E-09	7.30E-01	1.5E-09
Phenanthrene	6.51E-08	6.7E-11		
			Total Pathway:	4.0E-07
			Total Rad + Chem	4.0E-07

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	6.20E-06	2.5E-08	1.75E+00	4.5E-08
Beryllium	3.12E-09	1.3E-11	4.30E+00	5.5E-11
Lead	6.87E-06	2.8E-08		
Thallium	8.15E-06	3.4E-08		
TH-TOTAL	1.86E-07	7.6E-10		
2-Methylnaphthalene	4.65E-09	1.9E-11		
Benzo(a)anthracene	1.46E-07	6.0E-10	7.30E-01	4.4E-10
Benzo(a)pyrene	4.23E-07	1.7E-09	7.30E+00	1.3E-08
Benzo(b)fluoranthen	6.51E-07	2.7E-09	7.30E-01	2.0E-09
Phenanthrene	2.10E-08	8.6E-11		
			Total Pathway:	6.0E-08
			Total Rad + Chem	6.9E-08

Total
4.2E-07
1.5E-08
7.9E-10
2.3E-08
3.5E-09

Total: 4.7E-07

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TABLE B.3.1-21(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	1.6E-02	2.9E+01		
NP-237	1.1E-04	2.0E-01		
PU-238	1.3E-07	2.4E-04		
PU-239/240	6.7E-08	1.2E-04		
RA-226	6.2E-04	1.1E+00		
RA-228	2.7E-04	5.0E-01		
SR-90	1.1E-03	2.1E+00		
TH-228	6.9E-06	1.3E-02		
TH-230	3.2E-05	5.9E-02		
TH-232	2.5E-05	4.5E-02		
U-234	2.3E-04	4.3E-01		
U-235/236	1.0E-05	1.9E-02		
U-238	2.3E-04	4.3E-01		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	5.46E-03	4.0E+01		
NP-237	1.01E-05	7.5E-02		
PU-238	2.66E-08	2.0E-04		
PU-239/240	1.35E-08	9.9E-05		
RA-226	1.11E-03	8.1E+00		
RA-228	4.93E-04	3.6E+00		
SR-90	5.70E-03	4.2E+01		
TH-228	5.90E-06	4.3E-02		
TH-230	2.69E-05	2.0E-01		
TH-232	2.05E-05	1.5E-01		
U-234	7.00E-04	5.1E+00		
U-235/236	3.11E-05	2.3E-01		
U-238	7.00E-04	5.1E+00		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.1E-04	2.1E-07	3.0E-04	7.1E-04
Beryllium	3.5E-06	3.6E-09	5.0E-03	7.1E-07
Lead	8.2E-06	8.5E-09		
Thallium	1.6E-04	1.7E-07	7.0E-05	2.4E-03
TH-TOTAL	2.2E-07	2.3E-10		
2-Methylnaphthalene	1.5E-08	1.5E-11		
Benzo(a)anthracene	4.6E-07	4.7E-10		
Benzo(a)pyrene	1.3E-06	1.4E-09		
Benzo(b)fluoranthen	2.0E-06	2.1E-09		
Phenanthrene	6.5E-08	6.7E-11		

Total Pathway: 3.1E-03

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	6.20E-06	2.5E-08	3.0E-04	8.5E-05
Beryllium	3.12E-09	1.3E-11	5.0E-03	2.6E-09
Lead	6.87E-06	2.8E-08		
Thallium	8.15E-06	3.4E-08	7.0E-05	4.8E-04
TH-TOTAL	1.86E-07	7.6E-10		
2-Methylnaphthalene	4.65E-09	1.9E-11		
Benzo(a)anthracene	1.46E-07	6.0E-10		
Benzo(a)pyrene	4.23E-07	1.7E-09		
Benzo(b)fluoranthen	6.51E-07	2.7E-09		
Phenanthrene	2.10E-08	8.6E-11		

Total Pathway: 5.6E-04

Total
7.9E-04
7.1E-07
2.9E-03

Total Rad + Chem 3.1E-03

Total Rad + Chem 5.6E-04 *Total:* 3.7E-03

TABLE B.3.1-21(a) (continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	5.63E-06	1.0E-02	2.2E-10	2.3E-12
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	5.44E-02	1.0E+02	7.8E-10	7.8E-08
RA-228			1.0E-10	
SR-90	4.28E+00	7.9E+03	3.6E-11	2.8E-07
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.13E-02	1.1E+02	1.6E-11	1.8E-09
U-235/236	1.27E+00	2.3E+03	1.6E-11	3.7E-08
U-238			2.8E-11	
		Total Pathway:		4.0E-07

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	5.28E-07	3.9E-03	2.2E-10	8.5E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	1.00E-01	7.4E+02	7.8E-10	5.8E-07
RA-228			1.0E-10	
SR-90	2.17E+01	1.6E+05	3.6E-11	5.7E-06
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.90E-01	1.4E+03	1.6E-11	2.2E-08
U-235/236	3.95E+00	2.9E+04	1.6E-11	4.6E-07
U-238			2.8E-11	
		Total Pathway:		6.8E-06

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	3.10E-13	3.2E-16	1.75E+00	5.6E-16
Beryllium	8.43E-16	8.7E-19	4.30E+00	3.7E-18
Lead	2.53E-10	2.6E-13		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthene			7.30E-01	
Phenanthrene				
U-Total	4.53E-03	4.7E-06		
		Total Pathway:		5.6E-16

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	9.42E-15	3.9E-17	1.75E+00	6.8E-17
Beryllium	7.75E-19	3.2E-21	4.30E+00	1.4E-20
Lead	2.16E-10	8.9E-13		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthene			7.30E-01	
Phenanthrene				
U-Total	1.41E-02	5.8E-05		
		Total Pathway:		6.8E-17

	Total	Total Dust & Groundwater Affected
		1.9E-09
	3.1E-12	6.5E-11
		9.7E-14
		5.1E-14
	6.5E-07	6.6E-07
		4.1E-10
	6.0E-06	6.0E-06
		3.1E-12
		3.3E-12
		3.3E-11
	2.4E-08	2.4E-08
	5.0E-07	5.0E-07
		1.6E-10
	6.3E-16	4.2E-07
	3.7E-18	1.5E-08
		7.9E-10
		2.3E-08
		3.5E-09

Total Rad + Chem 4.0E-07

Total Rad + Chem 6.8E-06

Total: 7.2E-06 7.7E-06

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TABLE B.3.1-21(a) (continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Compound	Ingestion/Beef: Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Ingestion/Milk: Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137								
NP-237	5.6E-06	1.0E-02			5.28E-07	3.9E-03		
PU-238								
PU-239/240								
RA-226	5.4E-02	1.0E+02			1.00E-01	7.4E+02		
RA-228								
SR-90	4.3E+00	7.9E+03			2.17E+01	1.6E+05		
TH-228								
TH-230								
TH-232								
U-234	6.1E-02	1.1E+02			1.90E-01	1.4E+03		
U-235/236	1.3E+00	2.3E+03			3.95E+00	2.9E+04		
U-238								
Total Pathway:								

Chemical Hazard

Compound	Ingestion/Beef: Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Ingestion/Milk: Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	Total	Total Dust & Groundwater Affected
Arsenic	3.1E-13	3.2E-16	3.0E-04	1.1E-12	9.42E-15	3.9E-17	3.0E-04	1.3E-13	1.2E-12	7.9E-04
Beryllium	8.4E-16	8.7E-19	5.0E-03	1.7E-16	7.75E-19	3.2E-21	5.0E-03	6.4E-19	1.7E-16	7.1E-07
Lead	2.5E-10	2.6E-13			2.16E-10	8.9E-13				
Thallium			7.0E-05				7.0E-05			2.9E-03
TH-TOTAL										
2-Methylnaphthalene										
Benzo(a)anthracene										
Benzo(a)pyrene										
Benzo(b)fluoranthene										
Phenanthrene										
U-Total	4.5E-03	4.7E-06	3.0E-03	1.6E-03	1.41E-02	5.8E-05	3.0E-03	1.9E-02	2.1E-02	2.1E-02
Total Pathway:				1.6E-03				1.9E-02		
Total Rad + Chem				1.6E-03				1.9E-02	*Total:* 2.1E-02	2.4E-02

TABLE B.3.1-21(b)

FUTURE ON-PROPERTY CHILD

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.56E-02	9.5E-01	2.8E-11	2.7E-11	CS-137	5.46E-03	7.8E+00	2.8E-11	2.2E-10	2.4E-10
NP-237	1.12E-04	6.8E-03	2.2E-10	1.5E-12	NP-237	1.01E-05	1.4E-02	2.2E-10	3.2E-12	4.7E-12
PU-238	1.33E-07	8.1E-06	2.2E-10	1.8E-15	PU-238	2.66E-08	3.8E-05	2.2E-10	8.4E-15	1.0E-14
PU-239/240	6.75E-08	4.1E-06	2.3E-10	9.5E-16	PU-239/240	1.35E-08	1.9E-05	2.3E-10	4.4E-15	5.4E-15
RA-226	6.16E-04	3.8E-02	7.8E-10	2.9E-11	RA-226	1.11E-03	1.6E+00	7.8E-10	1.2E-09	1.3E-09
RA-228	2.72E-04	1.7E-02	1.0E-10	1.7E-12	RA-228	4.93E-04	7.0E-01	1.0E-10	7.0E-11	7.2E-11
SR-90	1.14E-03	6.9E-02	3.6E-11	2.5E-12	SR-90	5.70E-03	8.1E+00	3.6E-11	2.9E-10	3.0E-10
TH-228	6.94E-06	4.2E-04	5.5E-11	2.3E-14	TH-228	5.90E-06	8.4E-03	5.5E-11	4.6E-13	4.9E-13
TH-230	3.22E-05	2.0E-03	1.3E-11	2.6E-14	TH-230	2.69E-05	3.8E-02	1.3E-11	5.0E-13	5.2E-13
TH-232	2.46E-05	1.5E-03	1.7E-10	2.5E-13	TH-232	2.05E-05	2.9E-02	1.7E-10	5.0E-12	5.2E-12
U-234	2.33E-04	1.4E-02	1.6E-11	2.3E-13	U-234	7.00E-04	1.0E+00	1.6E-11	1.6E-11	1.6E-11
U-235/236	1.04E-05	6.3E-04	1.6E-11	1.0E-14	U-235/236	3.11E-05	4.4E-02	1.6E-11	7.1E-13	7.2E-13
U-238	2.33E-04	1.4E-02	2.8E-11	4.0E-13	U-238	7.00E-04	1.0E+00	2.8E-11	2.8E-11	2.8E-11
			Total Pathway:	6.2E-11				Total Pathway:	1.9E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.07E-04	3.3E-08	1.75E+00	5.7E-08	Arsenic	6.20E-06	2.3E-08	1.75E+00	4.0E-08	9.8E-08
Beryllium	3.46E-06	5.5E-10	4.30E+00	2.4E-09	Beryllium	3.12E-09	1.2E-11	4.30E+00	5.0E-11	2.4E-09
Lead	8.24E-06	1.3E-09			Lead	6.87E-06	2.6E-08			
Thallium	1.63E-04	2.6E-08			Thallium	8.15E-06	3.0E-08			
TH-TOTAL	2.23E-07	3.5E-11			TH-TOTAL	1.86E-07	6.9E-10			
2-Methylnaphthalene	1.47E-08	2.3E-12			2-Methylnaphthalene	4.65E-09	1.7E-11			
Benzo(a)anthracene	4.61E-07	7.3E-11	7.30E-01	5.3E-11	Benzo(a)anthracene	1.46E-07	5.5E-10	7.30E-01	4.0E-10	4.5E-10
Benzo(a)pyrene	1.33E-06	2.1E-10	7.30E+00	1.5E-09	Benzo(a)pyrene	4.23E-07	1.6E-09	7.30E+00	1.2E-08	1.3E-08
Benzo(b)fluoranthene	2.05E-06	3.3E-10	7.30E-01	2.4E-10	Benzo(b)fluoranthene	6.51E-07	2.4E-09	7.30E-01	1.8E-09	2.0E-09
Phenanthrene	6.51E-08	1.0E-11			Phenanthrene	2.10E-08	7.8E-11			
			Total Pathway:	6.2E-08				Total Pathway:	5.4E-08	
			Total Rad + Chem	6.2E-08				Total Rad + Chem	5.6E-08	*Total:* 1.2E-07

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TABLE B.3.1-21(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.6E-02	9.5E-01			CS-137	5.46E-03	7.8E+00			
NP-237	1.1E-04	6.8E-03			NP-237	1.01E-05	1.4E-02			
PU-238	1.3E-07	8.1E-06			PU-238	2.66E-08	3.8E-05			
PU-239/240	6.7E-08	4.1E-06			PU-239/240	1.35E-08	1.9E-05			
RA-226	6.2E-04	3.8E-02			RA-226	1.11E-03	1.6E+00			
RA-228	2.7E-04	1.7E-02			RA-228	4.93E-04	7.0E-01			
SR-90	1.1E-03	6.9E-02			SR-90	5.70E-03	8.1E+00			
TH-228	6.9E-06	4.2E-04			TH-228	5.90E-06	8.4E-03			
TH-230	3.2E-05	2.0E-03			TH-230	2.69E-05	3.8E-02			
TH-232	2.5E-05	1.5E-03			TH-232	2.05E-05	2.9E-02			
U-234	2.3E-04	1.4E-02			U-234	7.00E-04	1.0E+00			
U-235/236	1.0E-05	6.3E-04			U-235/236	3.11E-05	4.4E-02			
U-238	2.3E-04	1.4E-02			U-238	7.00E-04	1.0E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-04	3.8E-07	3.0E-04	1.3E-03	Arsenic	6.20E-06	2.7E-07	3.0E-04	9.0E-04	2.2E-03
Beryllium	3.5E-06	6.4E-09	5.0E-03	1.3E-06	Beryllium	3.12E-09	1.4E-10	5.0E-03	2.7E-08	1.3E-06
Lead	8.2E-06	1.5E-08			Lead	6.87E-06	3.0E-07			
Thallium	1.6E-04	3.0E-07	7.0E-05	4.3E-03	Thallium	8.15E-06	3.5E-07	7.0E-05	5.1E-03	9.4E-03
TH-TOTAL	2.2E-07	4.1E-10			TH-TOTAL	1.86E-07	8.1E-09			
2-Methylnaphthalene	1.5E-08	2.7E-11			2-Methylnaphthalen	4.65E-09	2.0E-10			
Benzo(a)anthracene	4.6E-07	8.5E-10			Benzo(a)anthracene	1.46E-07	6.4E-09			
Benzo(a)pyrene	1.3E-06	2.5E-09			Benzo(a)pyrene	4.23E-07	1.8E-08			
Benzo(b)fluoranthene	2.0E-06	3.8E-09			Benzo(b)fluoranthen	6.51E-07	2.8E-08			
Phenanthrene	6.5E-08	1.2E-10			Phenanthrene	2.10E-08	9.1E-10			
		Total Pathway:		5.6E-03			Total Pathway:		6.0E-03	
		Total Rad + Chem		5.6E-03			Total Rad + Chem		6.0E-03	*Total:* 1.2E-02

TABLE B.3.1-21(b)

(continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	5.63E-06	3.4E-04	2.2E-10	7.5E-14
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	5.44E-02	3.3E+00	7.8E-10	2.6E-09
RA-228			1.0E-10	
SR-90	4.28E+00	2.6E+02	3.6E-11	9.4E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	6.13E-02	3.7E+00	1.6E-11	6.0E-11
U-235/236	1.27E+00	7.7E+01	1.6E-11	1.2E-09
U-238			2.8E-11	
			Total Pathway:	1.3E-08

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	5.28E-07	7.5E-04	2.2E-10	1.7E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	1.00E-01	1.4E+02	7.8E-10	1.1E-07
RA-228			1.0E-10	
SR-90	2.17E+01	3.1E+04	3.6E-11	1.1E-06
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.90E-01	2.7E+02	1.6E-11	4.3E-09
U-235/236	3.95E+00	5.6E+03	1.6E-11	9.0E-08
U-238			2.8E-11	
			Total Pathway:	1.3E-06

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	3.10E-13	4.9E-17	1.75E+00	8.6E-17
Beryllium	8.43E-16	1.3E-19	4.30E+00	5.8E-19
Lead	2.53E-10	4.0E-14		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthene			7.30E-01	
Phenanthrene				
U-Total	4.53E-03	7.2E-07		
			Total Pathway:	8.7E-17

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	9.42E-15	3.5E-17	1.75E+00	6.1E-17
Beryllium	7.75E-19	2.9E-21	4.30E+00	1.2E-20
Lead	2.16E-10	8.0E-13		
Thallium				
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthene			7.30E-01	
Phenanthrene				
U-Total	1.41E-02	5.2E-05		
			Total Pathway:	6.1E-17

	Total	Total Dust & Groundwater Affected
		2.4E-10
	2.4E-13	4.9E-12
		1.0E-14
		5.4E-15
	1.1E-07	1.2E-07
		7.2E-11
	1.1E-06	1.1E-06
		4.9E-13
		5.2E-13
		5.2E-12
	4.4E-09	4.4E-09
	9.1E-08	9.1E-08
		2.8E-11
	1.5E-16	9.8E-08
	5.9E-19	2.4E-09
		4.5E-10
		1.3E-08
		2.0E-09

Total Rad + Chem 1.3E-08

Total Rad + Chem 1.3E-06

Total: 1.3E-06 1.3E-06

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TABLE B.3.1-21(b)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	5.6E-06			
PU-238				
PU-239/240				
RA-226	5.4E-02			
RA-228				
SR-90	4.3E+00			
TH-228				
TH-230				
TH-232				
U-234	6.1E-02			
U-235/236	1.3E+00			
U-238				

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	5.28E-07	7.5E-04		
PU-238				
PU-239/240				
RA-226	1.00E-01	1.4E+02		
RA-228				
SR-90	2.17E+01	3.1E+04		
TH-228				
TH-230				
TH-232				
U-234	1.90E-01	2.7E+02		
U-235/236	3.95E+00	5.6E+03		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.1E-13	5.8E-16	3.0E-04	1.9E-12
Beryllium	8.4E-16	1.6E-18	5.0E-03	3.1E-16
Lead	2.5E-10	4.7E-13		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	4.5E-03	8.4E-06	3.0E-03	2.8E-03

Total Pathway: 2.8E-03

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	9.42E-15	4.1E-16	3.0E-04	1.4E-12
Beryllium	7.75E-19	3.4E-20	5.0E-03	6.7E-18
Lead	2.16E-10	9.4E-12		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	1.41E-02	6.1E-04	3.0E-03	2.0E-01

Total Pathway: 2.0E-01

	Total	Total Dust & Groundwater Affected
Arsenic	3.3E-12	2.2E-03
Beryllium	3.2E-16	1.3E-06
Lead		9.4E-03
Thallium		
TH-TOTAL		
2-Methylnaphthalene		
Benzo(a)anthracene		
Benzo(a)pyrene		
Benzo(b)fluoranthene		
Phenanthrene		
U-Total	2.1E-01	2.1E-01

Total Rad + Chem 2.8E-03

Total Rad + Chem 2.0E-01 *Total:* 2.1E-01 2.1E-01

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TABLE B.3.1-22

FUTURE ON-PROPERTY FARMER (CT VALUES)

ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.91E-06	5.9E-02	1.9E-11	1.1E-12	1.1E-12
NP-237	4.13E-05	3.5E-01	2.9E-08	1.0E-08	1.0E-08
PU-238	5.25E-06	4.5E-02	3.9E-08	1.8E-09	1.8E-09
PU-239/240	2.48E-06	2.1E-02	3.8E-08	8.1E-10	8.1E-10
RA-226	3.45E-05	3.0E-01	7.0E-09	2.1E-09	2.1E-09
RA-228	2.40E-05	2.1E-01	6.9E-10	1.4E-10	1.4E-10
SR-90	3.38E-05	2.9E-01	6.2E-11	1.8E-11	1.8E-11
TH-228	2.85E-05	2.4E-01	7.8E-08	1.9E-08	1.9E-08
TH-230	2.67E-05	2.3E-01	2.9E-08	6.6E-09	6.6E-09
TH-232	2.03E-05	1.7E-01	1.1E-07	1.9E-08	1.9E-08
U-234	2.70E-05	2.3E-01	2.6E-08	6.0E-09	6.0E-09
U-235/236	1.20E-06	1.0E-02	2.5E-08	2.6E-10	2.6E-10
U-238	2.70E-05	2.3E-01	5.2E-08	1.2E-08	1.2E-08
			Total Pathway:	7.8E-08	

Chemical Risk					
Inhalation/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	6.74E-07	3.2E-09	1.5E+01	4.8E-08	4.8E-08
Beryllium	3.53E-08	1.7E-10	8.4E+00	1.4E-09	1.4E-09
Lead	4.16E-07	2.0E-09			
Thallium	2.03E-08	9.7E-11			
TH-TOTAL	1.84E-07	8.8E-10			
2-Methylnaphthalene	4.21E-10	2.0E-12			
Benzo(a)anthracene	8.27E-10	4.0E-12	6.1E-01	2.4E-12	2.4E-12
Benzo(a)pyrene	9.02E-10	4.3E-12	6.1E+00	2.6E-11	2.6E-11
Benzo(b)fluoranthene	1.35E-09	6.5E-12	6.1E-01	3.9E-12	3.9E-12
Phenanthrene	1.58E-09	7.6E-12			
			Total Pathway:	5.0E-08	

Total Rad + Chem 1.3E-07 *Total:* 1.3E-07

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TABLE B.3.1-22

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard					
Inhalation/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	6.91E-06				
NP-237	4.13E-05				
PU-238	5.25E-06				
PU-239/240	2.48E-06				
RA-226	3.45E-05				
RA-228	2.40E-05				
SR-90	3.38E-05				
TH-228	2.85E-05				
TH-230	2.67E-05				
TH-232	2.03E-05				
U-234	2.70E-05				
U-235/236	1.20E-06				
U-238	2.70E-05				
			Total Pathway:		

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.74E-07	2.5E-08		
Beryllium	3.53E-08	1.3E-09		
Lead	4.16E-07	1.5E-08		
Thallium	2.03E-08	7.6E-10		
TH-TOTAL	1.84E-07	6.9E-09		
2-Methylnaphthalene	4.21E-10	1.6E-11		
Benzo(a)anthracene	8.27E-10	3.1E-11		
Benzo(a)pyrene	9.02E-10	3.4E-11		
Benzo(b)fluoranthene	1.35E-09	5.0E-11		
Phenanthrene	1.58E-09	5.9E-11		
			Total Pathway:	

Total Rad + Chem | *Total:*

TABLE B.3.1-23
FUTURE, ON-PROPERTY FARMER (CT VALUES)
ACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237	3.14E-04	9.3E-01	2.2E-10	2.0E-10	Not applicable
SR-90	5.47E-01	1.6E+03	3.6E-11	5.8E-08	
U-234	1.98E+01	5.8E+04	1.6E-11	9.3E-07	
U-235/236	1.05E+00	3.1E+03	1.6E-11	5.0E-08	
U-238	2.18E+01	6.4E+04	2.8E-11	1.8E-06	
			Total Pathway:	2.8E-06	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
Arsenic	1.84E-13	3.0E-16	1.8E+00	5.3E-16	Arsenic	1.6E-15		
Beryllium	1.82E-15	3.0E-18	4.3E+00	1.3E-17	Beryllium	1.6E-17		
Lead	2.06E-09	3.4E-12			Lead	1.8E-11		
U-Total	7.76E-02	1.3E-04			U-Total	6.9E-04		
2-Methylnaphthalen	1.95E-03	3.2E-06			2-Methylnaphthalene	1.7E-05		
			Total Pathway:	5.4E-16			Total Pathway:	
			Total Rad + Chem	2.8E-06			Total Rad + Chem	

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TABLE B.3.1-23
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				2.0E-10
				5.8E-08
				9.3E-07
				5.0E-08
				1.8E-06
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	7.4E-19	1.8E+00	1.4E-18	5.3E-16
Beryllium			1.3E-17	2.6E-17
Lead	3.3E-17			
U-Total	3.1E-07			
2-Methylnaphthalene				
Total Pathway:			1.4E-17	

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.4E-17 *Total:* 2.8E-06

TABLE B.3.1-23
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	3.1E-04	9.3E-01			Not applicable
SR-90	5.5E-01	1.6E+03			
U-234	2.0E+01	5.8E+04			
U-235/236	1.1E+00	3.1E+03			
U-238	2.2E+01	6.4E+04			
		Total Pathway:			Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic	1.8E-13	2.4E-15	3.0E-04	7.9E-12	Arsenic	1.3E-14		
Beryllium	1.8E-15	2.3E-17	5.0E-03	4.7E-15	Beryllium	1.3E-16		
Lead	2.1E-09	2.6E-11			Lead	1.4E-10		
U-Total	7.8E-02	9.9E-04	3.0E-03	3.3E-01	U-Total	5.3E-03		
2-Methylnaphthalene	2.0E-03	2.5E-05			2-Methylnaphthalene	1.3E-04		
		Total Pathway:		3.3E-01		Total Pathway:		
		Total Rad + Chem		3.3E-01		Total Rad + Chem		

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TABLE B.3.1-23
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	5.7E-18	2.9E-04	2.0E-14	7.9E-12
Beryllium	5.7E-20	5.0E-05	1.1E-15	5.8E-15
Lead	2.6E-16			
U-Total	2.4E-06	1.5E-04	1.6E-02	3.5E-01
2-Methylnaphthalene	6.1E-08			
		Total Pathway:	1.6E-02	

Total Rad + Chem	1.6E-02	*Total:*	3.5E-01

TABLE B.3.1-24

FUTURE ON-PROPERTY FARMER (CT VALUES)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.77E-06	5.0E-01	2.8E-11	1.4E-11	CS-137	4.76E-06	2.8E-01	2.8E-11	8.0E-12	2.2E-11
NP-237	2.04E-05	2.2E+00	2.2E-10	4.8E-10	NP-237	2.04E-05	1.2E+00	2.2E-10	2.7E-10	7.4E-10
PU-238	2.57E-06	2.7E-01	2.2E-10	6.0E-11	PU-238	2.57E-06	1.5E-01	2.2E-10	3.4E-11	9.4E-11
PU-239/240	1.21E-06	1.3E-01	2.3E-10	3.0E-11	PU-239/240	1.21E-06	7.3E-02	2.3E-10	1.7E-11	4.6E-11
RA-226	1.74E-05	1.8E+00	7.8E-10	1.4E-09	RA-226	1.74E-05	1.0E+00	7.8E-10	8.1E-10	2.2E-09
RA-228	1.18E-05	1.2E+00	1.0E-10	1.2E-10	RA-228	1.17E-05	7.0E-01	1.0E-10	7.0E-11	1.9E-10
SR-90	1.86E-05	2.0E+00	3.6E-11	7.1E-11	SR-90	1.85E-05	1.1E+00	3.6E-11	4.0E-11	1.1E-10
TH-228	1.39E-05	1.5E+00	5.5E-11	8.1E-11	TH-228	1.35E-05	8.1E-01	5.5E-11	4.5E-11	1.3E-10
TH-230	1.33E-05	1.4E+00	1.3E-11	1.8E-11	TH-230	1.33E-05	8.0E-01	1.3E-11	1.0E-11	2.9E-11
TH-232	1.01E-05	1.1E+00	1.7E-10	1.8E-10	TH-232	1.01E-05	6.1E-01	1.7E-10	1.0E-10	2.9E-10
U-234	1.32E-05	1.4E+00	1.6E-11	2.2E-11	U-234	1.32E-05	7.9E-01	1.6E-11	1.3E-11	3.5E-11
U-235/236	5.88E-07	6.2E-02	1.6E-11	1.0E-12	U-235/236	5.88E-07	3.5E-02	1.6E-11	5.6E-13	1.6E-12
U-238	1.32E-05	1.4E+00	2.8E-11	3.9E-11	U-238	1.32E-05	7.9E-01	2.8E-11	2.2E-11	6.1E-11
			Total Pathway:	2.6E-09				Total Pathway:	1.4E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	4.06E-04	2.4E-08	1.8E+00	4.2E-08	Arsenic	4.06E-04	1.4E-08	1.8E+00	2.4E-08	6.6E-08
Beryllium	1.85E-05	1.1E-09	4.3E+00	4.7E-09	Beryllium	1.85E-05	6.2E-10	4.3E+00	2.7E-09	7.4E-09
Lead	2.17E-04	1.3E-08			Lead	2.17E-04	7.3E-09			
Thallium	1.07E-05	6.3E-10			Thallium	1.07E-05	3.6E-10			
TH-TOTAL	9.20E-05	5.4E-09			TH-TOTAL	9.20E-05	3.1E-09			
2-Methylnaphthalen	7.21E-07	4.3E-11			2-Methylnaphthalene	7.21E-07	2.4E-11			
Benzo(a)anthracene	4.35E-07	2.6E-11	7.3E-01	1.9E-11	Benzo(a)anthracene	4.32E-07	1.4E-11	7.3E-01	1.1E-11	2.9E-11
Benzo(a)pyrene	4.60E-07	2.7E-11	7.3E+00	2.0E-10	Benzo(a)pyrene	4.57E-07	1.5E-11	7.3E+00	1.1E-10	3.1E-10
Benzo(b)fluoranthen	6.84E-07	4.0E-11	7.3E-01	3.0E-11	Benzo(b)fluoranthene	6.78E-07	2.3E-11	7.3E-01	1.7E-11	4.6E-11
Phenanthrene	8.21E-07	4.9E-11			Phenanthrene	8.01E-07	2.7E-11			
			Total Pathway:	4.7E-08				Total Pathway:	2.7E-08	
			Total Rad + Chem	5.0E-08				Total Rad + Chem	2.8E-08	*Total:* 7.8E-08

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TABLE B.3.1-24

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.8E-06	5.0E-01		
NP-237	2.0E-05	2.2E+00		
PU-238	2.6E-06	2.7E-01		
PU-239/240	1.2E-06	1.3E-01		
RA-226	1.7E-05	1.8E+00		
RA-228	1.2E-05	1.2E+00		
SR-90	1.9E-05	2.0E+00		
TH-228	1.4E-05	1.5E+00		
TH-230	1.3E-05	1.4E+00		
TH-232	1.0E-05	1.1E+00		
U-234	1.3E-05	1.4E+00		
U-235/236	5.9E-07	6.2E-02		
U-238	1.3E-05	1.4E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.76E-06	2.8E-01		
NP-237	2.04E-05	1.2E+00		
PU-238	2.57E-06	1.5E-01		
PU-239/240	1.21E-06	7.3E-02		
RA-226	1.74E-05	1.0E+00		
RA-228	1.17E-05	7.0E-01		
SR-90	1.85E-05	1.1E+00		
TH-228	1.35E-05	8.1E-01		
TH-230	1.33E-05	8.0E-01		
TH-232	1.01E-05	6.1E-01		
U-234	1.32E-05	7.9E-01		
U-235/236	5.88E-07	3.5E-02		
U-238	1.32E-05	7.9E-01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.1E-04	1.9E-07	3.0E-04	6.2E-04
Beryllium	1.9E-05	8.5E-09	5.0E-03	1.7E-06
Lead	2.2E-04	1.0E-07		
Thallium	1.1E-05	4.9E-09	7.0E-05	7.0E-05
TH-TOTAL	9.2E-05	4.2E-08		
2-Methylnaphthalene	7.2E-07	3.3E-10		
Benzo(a)anthracene	4.4E-07	2.0E-10		
Benzo(a)pyrene	4.6E-07	2.1E-10		
Benzo(b)fluoranthene	6.8E-07	3.1E-10		
Phenanthrene	8.2E-07	3.8E-10		

Total Pathway: 7.0E-04

Total Rad + Chem 7.0E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.06E-04	1.1E-07	3.0E-04	3.5E-04
Beryllium	1.85E-05	4.8E-09	5.0E-03	9.6E-07
Lead	2.17E-04	5.6E-08		
Thallium	1.07E-05	2.8E-09	7.0E-05	4.0E-05
TH-TOTAL	9.20E-05	2.4E-08		
2-Methylnaphthalene	7.21E-07	1.9E-10		
Benzo(a)anthracene	4.32E-07	1.1E-10		
Benzo(a)pyrene	4.57E-07	1.2E-10		
Benzo(b)fluoranthene	6.78E-07	1.8E-10		
Phenanthrene	8.01E-07	2.1E-10		

Total Pathway: 3.9E-04

Total Rad + Chem 3.9E-04

Total	
	9.8E-04
	2.7E-06
	1.1E-04

Total: 1.1E-03

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TABLE B.3.1-24

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			2.2E-11
NP-237	1.56E-06	1.6E-01	2.2E-10	3.6E-11	NP-237	1.56E-06	9.3E-02	2.2E-10	2.0E-11	5.7E-11	8.0E-10
PU-238			2.2E-10		PU-238			2.2E-10			9.4E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			4.6E-11
RA-226	2.78E-03	2.9E+02	7.8E-10	2.3E-07	RA-226	2.78E-03	1.7E+02	7.8E-10	1.3E-07	3.6E-07	3.6E-07
RA-228			1.0E-10		RA-228			1.0E-10			1.9E-10
SR-90	1.12E-01	1.2E+04	3.6E-11	4.3E-07	SR-90	1.11E-01	6.7E+03	3.6E-11	2.4E-07	6.7E-07	6.7E-07
TH-228			5.5E-11		TH-228			5.5E-11			1.3E-10
TH-230			1.3E-11		TH-230			1.3E-11			2.9E-11
TH-232			1.7E-10		TH-232			1.7E-10			2.9E-10
U-234	5.15E-03	5.4E+02	1.6E-11	8.7E-09	U-234	5.15E-03	3.1E+02	1.6E-11	4.9E-09	1.4E-08	1.4E-08
U-235/236	1.07E-01	1.1E+04	1.6E-11	1.8E-07	U-235/236	1.07E-01	6.4E+03	1.6E-11	1.0E-07	2.8E-07	2.8E-07
U-238			2.8E-11		U-238			2.8E-11			6.1E-11
		Total Pathway:		8.4E-07			Total Pathway:		4.8E-07		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic	1.16E-12	6.9E-17	1.8E+00	1.2E-16	Arsenic	1.16E-12	3.9E-17	1.8E+00	6.8E-17	1.9E-16	6.6E-08
Beryllium	9.71E-15	5.7E-19	4.3E+00	2.5E-18	Beryllium	9.71E-15	3.2E-19	4.3E+00	1.4E-18	3.9E-18	7.4E-09
Lead	1.09E-08	6.5E-13			Lead	1.09E-08	3.6E-13				
Thallium					Thallium						
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			2.9E-11
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			3.1E-10
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			4.6E-11
Phenanthrene					Phenanthrene						
U-Total	3.80E-01	2.3E-05			U-Total	3.80E-01	1.3E-05				
		Total Pathway:		1.2E-16			Total Pathway:		6.9E-17		
		Total Rad + Chem		8.4E-07			Total Rad + Chem		4.8E-07	*Total:*	1.3E-06	1.4E-06

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TABLE B.3.1-24
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.6E-06	1.6E-01		
PU-238				
PU-239/240				
RA-226	2.8E-03	2.9E+02		
RA-228				
SR-90	1.1E-01	1.2E+04		
TH-228				
TH-230				
TH-232				
U-234	5.1E-03	5.4E+02		
U-235/236	1.1E-01	1.1E+04		
U-238				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.56E-06	9.3E-02		
PU-238				
PU-239/240				
RA-226	2.78E-03	1.7E+02		
RA-228				
SR-90	1.11E-01	6.7E+03		
TH-228				
TH-230				
TH-232				
U-234	5.15E-03	3.1E+02		
U-235/236	1.07E-01	6.4E+03		
U-238				

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.2E-12	5.3E-16	3.0E-04	1.8E-12
Beryllium	9.7E-15	4.5E-18	5.0E-03	8.9E-16
Lead	1.1E-08	5.0E-12		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.8E-01	1.8E-04	3.0E-03	5.8E-02

Total Pathway: 5.8E-02

Total Rad + Chem 5.8E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.16E-12	3.0E-16	3.0E-04	1.0E-12
Beryllium	9.71E-15	2.5E-18	5.0E-03	5.1E-16
Lead	1.09E-08	2.8E-12		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	3.80E-01	9.9E-05	3.0E-03	3.3E-02

Total Pathway: 3.3E-02

Total Rad + Chem 3.3E-02

Total	Total Dust & Groundwater Affected
2.8E-12	9.8E-04
1.4E-15	2.7E-06
	1.1E-04
9.1E-02	9.1E-02
Total: 9.1E-02	9.2E-02

TABLE B.3.1-25

FUTURE ON-PROPERTY FARMER (CT VALUES)

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.56E-02	1.6E+00	2.8E-11	4.6E-11	CS-137	5.46E-03	1.8E+00	2.8E-11	5.1E-11	9.7E-11
NP-237	1.12E-04	1.2E-02	2.2E-10	2.6E-12	NP-237	1.01E-05	3.4E-03	2.2E-10	7.4E-13	3.3E-12
PU-238	1.33E-07	1.4E-05	2.2E-10	3.1E-15	PU-238	2.66E-08	8.8E-06	2.2E-10	1.9E-15	5.0E-15
PU-239/240	6.75E-08	7.1E-06	2.3E-10	1.6E-15	PU-239/240	1.35E-08	4.5E-06	2.3E-10	1.0E-15	2.7E-15
RA-226	6.16E-04	6.5E-02	7.8E-10	5.1E-11	RA-226	1.11E-03	3.7E-01	7.8E-10	2.9E-10	3.4E-10
RA-228	2.72E-04	2.9E-02	1.0E-10	2.9E-12	RA-228	4.93E-04	1.6E-01	1.0E-10	1.6E-11	1.9E-11
SR-90	1.14E-03	1.2E-01	3.6E-11	4.3E-12	SR-90	5.70E-03	1.9E+00	3.6E-11	6.8E-11	7.2E-11
TH-228	6.94E-06	7.3E-04	5.5E-11	4.0E-14	TH-228	5.90E-06	2.0E-03	5.5E-11	1.1E-13	1.5E-13
TH-230	3.22E-05	3.4E-03	1.3E-11	4.4E-14	TH-230	2.69E-05	8.9E-03	1.3E-11	1.2E-13	1.6E-13
TH-232	2.46E-05	2.6E-03	1.7E-10	4.4E-13	TH-232	2.05E-05	6.8E-03	1.7E-10	1.2E-12	1.6E-12
U-234	2.33E-04	2.5E-02	1.6E-11	3.9E-13	U-234	7.00E-04	2.3E-01	1.6E-11	3.7E-12	4.1E-12
U-235/236	1.04E-05	1.1E-03	1.6E-11	1.7E-14	U-235/236	3.11E-05	1.0E-02	1.6E-11	1.7E-13	1.8E-13
U-238	2.33E-04	2.5E-02	2.8E-11	6.9E-13	U-238	7.00E-04	2.3E-01	2.8E-11	6.5E-12	7.2E-12
			Total Pathway:	1.1E-10				Total Pathway:	4.3E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.07E-04	1.2E-08	1.75E+00	2.1E-08	Arsenic	6.20E-06	1.2E-09	1.75E+00	2.0E-09	2.3E-08
Beryllium	3.46E-06	2.0E-10	4.30E+00	8.8E-10	Beryllium	3.12E-09	5.8E-13	4.30E+00	2.5E-12	8.8E-10
Lead	8.24E-06	4.9E-10			Lead	6.87E-06	1.3E-09			
Thallium	1.63E-04	9.6E-09			Thallium	8.15E-06	1.5E-09			
TH-TOTAL	2.23E-07	1.3E-11			TH-TOTAL	1.86E-07	3.4E-11			
2-Methylnaphthalene	1.47E-08	8.7E-13			2-Methylnaphthalene	4.65E-09	8.6E-13			
Benzo(a)anthracene	4.61E-07	2.7E-11	7.30E-01	2.0E-11	Benzo(a)anthracene	1.46E-07	2.7E-11	7.30E-01	2.0E-11	4.0E-11
Benzo(a)pyrene	1.33E-06	7.8E-11	7.30E+00	5.7E-10	Benzo(a)pyrene	4.23E-07	7.9E-11	7.30E+00	5.7E-10	1.1E-09
Benzo(b)fluoranthene	2.05E-06	1.2E-10	7.30E-01	8.8E-11	Benzo(b)fluoranthene	6.51E-07	1.2E-10	7.30E-01	8.8E-11	1.8E-10
Phenanthrene	6.51E-08	3.8E-12			Phenanthrene	2.10E-08	3.9E-12			
			Total Pathway:	2.3E-08				Total Pathway:	2.7E-09	
			Total Rad + Chem	2.3E-08				Total Rad + Chem	3.1E-09	*Total:* 2.6E-08

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TABLE B.3.1-25

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.6E-02	1.6E+00			CS-137	5.46E-03	1.8E+00			
NP-237	1.1E-04	1.2E-02			NP-237	1.01E-05	3.4E-03			
PU-238	1.3E-07	1.4E-05			PU-238	2.66E-08	8.8E-06			
PU-239/240	6.7E-08	7.1E-06			PU-239/240	1.35E-08	4.5E-06			
RA-226	6.2E-04	6.5E-02			RA-226	1.11E-03	3.7E-01			
RA-228	2.7E-04	2.9E-02			RA-228	4.93E-04	1.6E-01			
SR-90	1.1E-03	1.2E-01			SR-90	5.70E-03	1.9E+00			
TH-228	6.9E-06	7.3E-04			TH-228	5.90E-06	2.0E-03			
TH-230	3.2E-05	3.4E-03			TH-230	2.69E-05	8.9E-03			
TH-232	2.5E-05	2.6E-03			TH-232	2.05E-05	6.8E-03			
U-234	2.3E-04	2.5E-02			U-234	7.00E-04	2.3E-01			
U-235/236	1.0E-05	1.1E-03			U-235/236	3.11E-05	1.0E-02			
U-238	2.3E-04	2.5E-02			U-238	7.00E-04	2.3E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.1E-04	9.5E-08	3.0E-04	3.2E-04	Arsenic	6.20E-06	8.9E-09	3.0E-04	3.0E-05	3.5E-04
Beryllium	3.5E-06	1.6E-09	5.0E-03	3.2E-07	Beryllium	3.12E-09	4.5E-12	5.0E-03	9.0E-10	3.2E-07
Lead	8.2E-06	3.8E-09			Lead	6.87E-06	9.9E-09			
Thallium	1.6E-04	7.5E-08	7.0E-05	1.1E-03	Thallium	8.15E-06	1.2E-08	7.0E-05	1.7E-04	1.2E-03
TH-TOTAL	2.2E-07	1.0E-10			TH-TOTAL	1.86E-07	2.7E-10			
2-Methylnaphthalene	1.5E-08	6.7E-12			2-Methylnaphthalene	4.65E-09	6.7E-12			
Benzo(a)anthracene	4.6E-07	2.1E-10			Benzo(a)anthracene	1.46E-07	2.1E-10			
Benzo(a)pyrene	1.3E-06	6.1E-10			Benzo(a)pyrene	4.23E-07	6.1E-10			
Benzo(b)fluoranthen	2.0E-06	9.4E-10			Benzo(b)fluoranthen	6.51E-07	9.4E-10			
Phenanthrene	6.5E-08	3.0E-11			Phenanthrene	2.10E-08	3.0E-11			
		Total Pathway:		1.4E-03			Total Pathway:		2.0E-04	

Total Rad + Chem 1.4E-03

Total Rad + Chem 2.0E-04 *Total:* 1.6E-03

TABLE B.3.1-25

(continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			9.7E-11
NP-237	5.63E-06	5.9E-04	2.2E-10	1.3E-13	NP-237	5.28E-07	1.8E-04	2.2E-10	3.9E-14	1.7E-13	3.5E-12
PU-238			2.2E-10		PU-238			2.2E-10			5.0E-15
PU-239/240			2.3E-10		PU-239/240			2.3E-10			2.7E-15
RA-226	5.44E-02	5.7E+00	7.8E-10	4.5E-09	RA-226	1.00E-01	3.3E+01	7.8E-10	2.6E-08	3.0E-08	3.1E-08
RA-228			1.0E-10		RA-228			1.0E-10			1.9E-11
SR-90	4.28E+00	4.5E+02	3.6E-11	1.6E-08	SR-90	2.17E+01	7.2E+03	3.6E-11	2.6E-07	2.8E-07	2.8E-07
TH-228			5.5E-11		TH-228			5.5E-11			1.5E-13
TH-230			1.3E-11		TH-230			1.3E-11			1.6E-13
TH-232			1.7E-10		TH-232			1.7E-10			1.6E-12
U-234	6.13E-02	6.5E+00	1.6E-11	1.0E-10	U-234	1.90E-01	6.3E+01	1.6E-11	1.0E-09	1.1E-09	1.1E-09
U-235/236	1.27E+00	1.3E+02	1.6E-11	2.1E-09	U-235/236	3.95E+00	1.3E+03	1.6E-11	2.1E-08	2.3E-08	2.3E-08
U-238			2.8E-11		U-238			2.8E-11			7.2E-12
		Total Pathway:		2.3E-08			Total Pathway:		3.1E-07		

Chemical Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk		
Arsenic	3.10E-13	1.8E-17	1.75E+00	3.2E-17	Arsenic	9.42E-15	1.7E-18	1.75E+00	3.1E-18	3.5E-17	2.3E-08
Beryllium	8.43E-16	5.0E-20	4.30E+00	2.1E-19	Beryllium	7.75E-19	1.4E-22	4.30E+00	6.2E-22	2.1E-19	8.8E-10
Lead	2.53E-10	1.5E-14			Lead	2.16E-10	4.0E-14				
Thallium					Thallium						
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene			7.30E-01		Benzo(a)anthracene			7.30E-01			4.0E-11
Benzo(a)pyrene			7.30E+00		Benzo(a)pyrene			7.30E+00			1.1E-09
Benzo(b)fluoranthene			7.30E-01		Benzo(b)fluoranthene			7.30E-01			1.8E-10
Phenanthrene					Phenanthrene						
U-Total	4.53E-03	2.7E-07			U-Total	1.41E-02	2.6E-06				
		Total Pathway:		3.2E-17			Total Pathway:		3.1E-18		
		Total Rad + Chem		2.3E-08			Total Rad + Chem		3.1E-07	*Total:* 3.3E-07	3.6E-07

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TABLE B.3.1-25

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	5.6E-06	5.9E-04		
PU-238				
PU-239/240				
RA-226	5.4E-02	5.7E+00		
RA-228				
SR-90	4.3E+00	4.5E+02		
TH-228				
TH-230				
TH-232				
U-234	6.1E-02	6.5E+00		
U-235/236	1.3E+00	1.3E+02		
U-238				

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	5.28E-07	1.8E-04		
PU-238				
PU-239/240				
RA-226	1.00E-01	3.3E+01		
RA-228				
SR-90	2.17E+01	7.2E+03		
TH-228				
TH-230				
TH-232				
U-234	1.90E-01	6.3E+01		
U-235/236	3.95E+00	1.3E+03		
U-238				

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.1E-13	1.4E-16	3.0E-04	4.7E-13
Beryllium	8.4E-16	3.9E-19	5.0E-03	7.7E-17
Lead	2.5E-10	1.2E-13		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	4.5E-03	2.1E-06	3.0E-03	6.9E-04

Total Pathway: 6.9E-04

Total Rad + Chem 6.9E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	9.42E-15	1.4E-17	3.0E-04	4.5E-14
Beryllium	7.75E-19	1.1E-21	5.0E-03	2.2E-19
Lead	2.16E-10	3.1E-13		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	1.41E-02	2.0E-05	3.0E-03	6.8E-03

Total Pathway: 6.8E-03

Total Rad + Chem 6.8E-03

Total	Total Dust & Groundwater Affected
5.2E-13	3.5E-04
7.7E-17	3.2E-07
	1.2E-03
7.4E-03	7.4E-03
Total: 7.4E-03	9.0E-03

TABLE B.3.1-26(a)
CURRENT/FUTURE GREAT MIAMI RIVER RECREATIONAL USER, ADULT
ACTIVE FLYASH PILE: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Chemical Risk

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	1.6E-07	2.4E-12	1.8E+00	4.3E-12
Lead	5.2E-07	7.9E-12		
			Total Pathway	4.3E-12
			Total Rad + Chem:	4.3E-12

Dermal Contact/Surface Water

Compound	Intake	SF(derm)	Risk
Arsenic	1.1E-12	1.8E+00	2.1E-12
Lead	1.4E-14		
		Total Pathway	2.1E-12
		Total Rad + Chem:	2.1E-12

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
Arsenic	7.04E-06	7.8E-10	1.8E+00	1.4E-09
Lead	2.52E-05	2.8E-09		
			Total Pathway:	1.4E-09
			Total Rad + Chem:	1.4E-09

1.4E-09

Total: 1.4E-09

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TABLE B.3.1-26(a)
(continued)

Noncarcinogenic Hazard

Chemical Hazard

Ingestion of Surface Water					Dermal Contact/Surface Water				Ingestion of Fish					
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm	Hazard	Compound	Conc'n-Fish (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	1.60E-07	5.7E-12	3.0E-04	1.9E-08	Arsenic	2.6E-12	2.9E-04	9.2E-09	Arsenic	7.04E-06	1.8E-09	3.0E-04	6.1E-06	6.1E-06
Lead	5.15E-07	1.8E-11			Lead	3.4E-14			Lead	2.52E-05	6.5E-09			
			Total Pathway	1.9E-08			Total Pathway:	9.2E-09				Total Pathway:	6.1E-06	
			Total Rad + Chem:	1.9E-08			Total Rad + Chem:	9.2E-09				Total Rad + Chem:	6.1E-06	Total: 6.1E-06

TABLE B.3.1-26(b)

CURRENT/FUTURE GREAT MIAMI RIVER AGRICULTURAL USER

ACTIVE FLYASH PILE: BEEF AND MILK (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Chemical Risk										
Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.70E-07	2.8E-10	1.8E+00	4.9E-10	Arsenic	8.19E-09	3.4E-11	1.8E+00	5.9E-11	5.5E-10
Lead	6.32E-08	6.6E-11			Lead	5.40E-08	2.2E-10			
			Total Pathway:	4.9E-10				Total Pathway:	5.9E-11	
			Total Rad + Chem	4.9E-10				Total Rad + Chem	5.9E-11	*Total:* 5.5E-10

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TABLE B.3.1-26(b)
(continued)

NONCARCINOGENIC HAZARD

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.7E-07	2.8E-10	3.0E-04	9.3E-07
Lead	6.3E-08	6.6E-11		

Total Pathway: 9.3E-07

Total Rad + Chem 9.3E-07

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic	8.19E-09	3.4E-11	3.0E-04	1.1E-07
Lead	5.40E-08	2.2E-10		

Total Pathway: 1.1E-07

Total Rad + Chem 1.1E-07

1.0E-06

Total: 1.0E-06

TABLE B.3.1-26(c)

CURRENT/FUTURE GREAT MIAMI AGRICULTURAL USER

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.01E-06	1.1E-09	1.8E+00	1.9E-09
Lead	2.73E-06	3.0E-09		
			Total Pathway:	1.9E-09
			Total Rad + Chem	1.9E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.01E-06	5.9E-10	1.8E+00	1.0E-09
Lead	2.73E-06	1.6E-09		
			Total Pathway:	1.0E-09
			Total Rad + Chem	1.0E-09

3.0E-09

Total: 3.0E-09

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TABLE B.3.1-26(c)
(continued)

NONCARCINOGENIC HAZARD

Chemical Hazard										
Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	1.0E-06	1.1E-09	3.0E-04	3.7E-06	Arsenic	1.01E-06	5.9E-10	3.0E-04	2.0E-06	5.7E-06
Lead	2.7E-06	3.0E-09			Lead	2.73E-06	1.6E-09			
			Total Pathway:	3.7E-06				Total Pathway:	2.0E-06	
			Total Rad + Chem	3.7E-06				Total Rad + Chem	2.0E-06	*Total:* 5.7E-06

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TABLE B.3.1-26(d)
CURRENT/FUTURE, GREAT MIAMI RIVER RESIDENTIAL USER, ADULT
ACTIVE FLYASH PILE: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Inhalation of Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(i)	Risk
Arsenic	1.6E-07	1.6E-08		
Lead	5.2E-07	5.3E-08		
		Total Pathway		
		Total Rad + Chem		

Ingestion of Surface Water					
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.6E-07	4.4E-09	1.8E+00	7.7E-09	
Lead	5.2E-07	1.4E-08			
			Total Pathway	7.7E-09	
			Total Rad + Chem	7.7E-09	

Dermal Contact/Surface Water					
Compound	Intake	SF(derm)	Risk		
Arsenic	2.0E-15	1.8E+00	3.7E-15		7.7E-09
Lead	2.1E-14				
			Total Pathway	3.7E-15	
			Total Rad + Chem	3.7E-15	**Total:** 7.7E-09

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TABLE B.3.1-26(d)
(continued)

Noncarcinogenic Hazard

Chemical Hazard

Inhalation of Surface Water

Compound	Conc'n (mg/L	Intake	RfD(i)	Hazard
Arsenic	1.6E-07	1.6E-08		
Lead	5.2E-07	5.3E-08		

Total Pathway:

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.60E-07	4.4E-09	3.0E-04	1.5E-05
Lead	5.15E-07	1.4E-08		

Total Pathway 1.5E-05

Dermal Contact/Surface Water

Compound	Intake	RfD(derm)	Hazard
Arsenic	2.0E-15	2.9E-04	7.1E-12
Lead	2.1E-14		

Total Pathway: 7.1E-12

1.5E-05

Total Rad + Chem:

Total Rad + Chem 1.5E-05

Total Rad + Chem 7.1E-12

Total: 1.5E-05

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TABLE B.3.2-2(a)
Constituents of Potential Concern (CPCs)
South Field: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	L	21	21	7110	16300	–[e]	–	–	–	10329	10329	Y	–	ND[g]	D	N	10329
Antimony	mg/kg	U	10	2	1.2	1.9	0.89	1.3	0.7605	–	–	–	N	Y	10.8	G	N	1.900
Arsenic	mg/kg	L	21	21	4.6	9.3	–	–	–	–	6.680	7.268	Y	–	0.0366		Y	7.268
Barium	mg/kg	L	21	21	55.1	151	–	–	–	–	81.80	90.77	Y	–	1890	G	N	90.77
Beryllium	mg/kg	L	21	20	0.49	1.9	0.92	0.92	–	–	0.8145	0.9422	Y	–	0.0149		Y	0.9422
Calcium	mg/kg	L	21	21	12900	140000	–	–	–	–	61709	78143	Y	–	ND	D	N	78143
Chromium	mg/kg	N	21	20	8.8	21.5	8.1	8.1	12.59	13.90	–	–	Y	–	135	G	N	13.90
Cobalt	mg/kg	U	21	21	3.7	13.9	–	–	6.967	–	–	–	N	N	1670	A, B	N	13.90
Copper	mg/kg	N	21	21	9.3	19.6	–	–	15.59	16.62	–	–	Y	–	999	G	N	16.62
Cyanide	mg/kg	U	21	10	0.12	0.32	0.12	0.15	0.1224	–	–	–	N	Y	540	G	N	0.3200
Iron	mg/kg	N	21	21	12800	20700	–	–	17405	18297	–	–	Y	–	ND	D	N	18297
Lead	mg/kg	L	21	21	13.7	46	–	–	–	–	21.66	24.58	Y	–	ND		Y	24.58
Magnesium	mg/kg	L	21	21	6490	31600	–	–	–	–	18124	21447	Y	–	262000	D	N	21447
Manganese	mg/kg	U	21	21	368	2650	–	–	694.3	–	–	–	N	Y	3780	G	N	2650
Molybdenum	mg/kg	U	21	17	4	6.2	4.7	9.2	4.829	–	–	–	Y	–	135	G	N	6.200
Nickel	mg/kg	N	21	20	11.9	22.7	16.3	16.3	15.89	17.10	–	–	Y	–	540	G	N	17.10
Potassium	mg/kg	N	21	21	903	2170	–	–	1447	1561	–	–	Y	–	ND	D	N	1561
Selenium	mg/kg	U	21	4	0.52	0.72	0.36	0.52	0.2995	–	–	–	N	Y	135	G	N	0.7200
Silicon	mg/kg	L	21	21	406	1080	–	–	–	–	621.5	701.2	N	N	ND	A, B	N	701.2
Silver	mg/kg	N	21	20	3.2	6.5	4.6	4.6	4.971	5.384	–	–	Y	–	135	G	N	5.384
Sodium	mg/kg	L	21	21	69.5	328	–	–	–	–	119.0	137.4	Y	–	ND	D	N	137.4
Vanadium	mg/kg	N	21	21	17.8	30.8	–	–	25.03	26.59	–	–	Y	–	189	G	N	26.59
Zinc	mg/kg	N	21	21	33.3	67.8	–	–	49.70	52.73	–	–	Y	–	8100	G	N	52.73
CS-137	pci/g	N	21	19	0.089	0.836	0.087	0.109	0.4030	0.4987	–	–	N	Y	--[i]		Y	0.4987
GROSS ALPHA	pci/g	L	21	21	18.7	237	–	–	–	–	50.88	72.04	*[f]	–	ND		N[h]	72.04
GROSS BETA	pci/g	L	21	21	27.7	113	–	–	–	–	44.72	51.93	*	–	ND		N[h]	51.93
NP-237	pci/g	U	15	3	0.11	0.214	0.052	0.483	0.1060	–	–	–	*	–	--		Y	0.2140
PU-238	pci/g	U	17	3	0.019	0.116	0.019	0.341	0.0450	–	–	–	*	–	--		Y	0.1160
PU-239/240	pci/g	U	17	2	0.061	0.076	0.019	0.132	0.0287	–	–	–	*	–	--		Y	0.0760
RA-226	pci/g	U	21	21	0.874	30.8	–	–	3.734	–	–	–	N	Y	--		Y	30.80
RA-228	pci/g	U	21	21	0.917	3.88	–	–	1.306	–	–	–	Y*	Y	--		Y	3.880
SR-90	pci/g	U	21	1	0.16	0.16	0.355	1	0.2573	–	–	–	N	Y	--		Y	0.1600
TC-99	pci/g	U	21	1	142	142	0.31	0.392	6.931	–	–	–	N	Y	--		Y	142.0
TH-228	pci/g	U	16	15	0.658	4.41	1.71	1.71	1.130	–	–	–	N	Y	--		Y	4.410
TH-230	pci/g	U	16	16	0.117	13.8	–	–	3.117	–	–	–	Y	–	--		Y	13.80
TH-232	pci/g	U	16	16	0.19	3.99	–	–	1.071	–	–	–	N	Y	--		Y	3.990
TH-TOTAL	mg/kg	U	16	16	6.2	36.7	–	–	10.26	–	–	–	*	Y	ND		Y	36.70
U-234	pci/g	L	21	21	2.73	16.3	–	–	–	–	6.923	8.658	Y	–	--		Y	8.658
U-235/236	pci/g	U	21	6	0.17	0.887	0.149	0.47	0.2398	–	–	–	Y	–	--		Y	0.8870
U-238	pci/g	L	21	21	2.87	16.6	–	–	–	–	7.489	9.311	Y	–	--		Y	9.311
U-TOTAL	mg/kg	N	21	21	1.86	50.6	–	–	24.88	29.58	–	–	*	–	81	G	N	29.58
Aroclor-1254	mg/kg	U	21	1	0.089	0.089	0.039	0.05	0.02480	–	–	–	–	–	0.00831		Y	0.089

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TABLE B.3.2-2(a)
Constituents of Potential Concern (CPCs)
South Field: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aroclor-1260	mg/kg	U	21	2	0.038	0.052	0.04	0.05	0.02390	-	-	-	-	-	0.00831		Y	0.052
Dieldrin	mg/kg	U	21	1	0.009	0.0097	0.003	0.005	0.00251	-	-	-	-	-	0.004		Y	0.0097
Endrin ketone	mg/kg	U	20	1	0.005	0.0059	0.003	0.005	0.00234	-	-	-	-	-	8.1	G	N	0.0059
Acenaphthene	mg/kg	U	20	1	0.14	0.14	0.39	4	0.30225	-	-	-	-	-	1620	G	N	0.14
Acenaphthylene	mg/kg	U	21	5	0.055	1.2	0.41	0.5	0.26619	-	-	-	-	-	1620	G	N	1.2
Anthracene	mg/kg	U	21	6	0.059	0.73	0.41	0.5	0.23623	-	-	-	-	-	8100	G	N	0.73
Benzo(a)anthracene	mg/kg	U	21	12	0.044	5.5	0.41	0.5	0.57180	-	-	-	-	-	0.0877		Y	5.5
Benzo(a)pyrene	mg/kg	U	21	12	0.051	9.4	0.41	0.5	0.89004	-	-	-	-	-	0.00877		Y	9.4
Benzo(b)fluoranthene	mg/kg	U	21	12	0.046	6.2	0.41	0.5	0.68728	-	-	-	-	-	0.0877		Y	6.2
Benzo(g,h,i)perylene	mg/kg	U	21	12	0.051	6.2	0.41	0.48	0.63571	-	-	-	-	-	ND		Y	6.2
Benzo(k)fluoranthene	mg/kg	U	21	13	0.049	7.3	0.41	0.5	0.70671	-	-	-	-	-	0.877		Y	7.3
Benzoic acid	mg/kg	U	17	10	0.052	0.27	1.9	2.2	0.47529	-	-	-	-	-	108000	G	N	0.27
Carbazole	mg/kg	U	21	3	0.048	0.17	0.41	4	0.28547	-	-	-	-	-	3.2	G	N	0.17
Chrysene	mg/kg	U	21	13	0.06	6	0.41	0.5	0.64704	-	-	-	-	-	8.77	G	N	6
Dibenzo(a,h)anthracene	mg/kg	U	21	7	0.043	1.9	0.41	0.5	0.31704	-	-	-	-	-	0.00877		Y	1.9
Dibenzofuran	mg/kg	U	21	1	0.13	0.13	0.39	4	0.29690	-	-	-	-	-	108	G	N	0.13
Dimethyl phthalate	mg/kg	U	21	1	0.062	0.062	0.39	4	0.29390	-	-	-	-	-	27000	G	N	0.062
Fluoranthene	mg/kg	L	21	16	0.045	9.2	0.43	0.48	-	-	0.672	1.849	-	-	1080	G	N	1.84896
Fluorene	mg/kg	U	21	1	0.22	0.22	0.39	4	0.30119	-	-	-	-	-	1080	G	N	0.22
Indeno(1,2,3-cd)pyrene	mg/kg	U	21	10	0.045	6	0.41	0.5	0.628	-	-	-	-	-	0.0877		Y	6
Phenanthrene	mg/kg	U	21	9	0.048	2.3	0.41	0.5	0.36766	-	-	-	-	-	ND		Y	2.3
Pyrene	mg/kg	U	21	13	0.062	8.2	0.41	0.5	0.79928	-	-	-	-	-	810	G	N	8.2
bis(2-Ethylhexyl) phthalate	mg/kg	U	21	19	0.064	0.11	0.45	4	0.18123	-	-	-	-	-	4.57	G	N	0.11
Acetone	mg/kg	U	21	5	0.007	0.068	0.01	0.041	0.01159	-	-	-	-	-	2700	G	N	0.068
Methylene chloride	mg/kg	U	21	2	0.003	0.005	0.006	0.014	0.00559	-	-	-	-	-	8.53	G	N	0.005

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concen term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] - Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[j] Summary of Screening Criteria:
(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).

TABLE B.3.2–2(a)
Constituents of Potential Concern (CPCs)
South Field: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	CPC–1[b]	CPC–2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)

(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

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TABLE B.3.2-2(b)
Constituents of Potential Concern (CPCs)
South Field\Inactive Flyash Pile: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	NPar.95	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg pCi/g)
Aluminum	mg/kg	N	93	93	2130	22800	--	--	9360	10072	--[e]	--	--	N	--	ND[g]	A	N	10072
Antimony	mg/kg	U	69	17	1.2	29.7	0.24	13.8	3.74	--	--	--	18.7	N	--	10.8	A	N	18.70
Arsenic	mg/kg	L	93	93	1.5	81.8	--	--	--	--	10.22	12.06	--	Y	--	0.0366		Y	12.06
Barium	mg/kg	L	93	93	8	1080	--	--	--	--	146.9	181.3	--	Y	--	1890	G	N	181.3
Beryllium	mg/kg	L	93	76	0.31	8.7	0.39	1.7	--	--	1.212	1.438	--	Y	--	0.0149		Y	1.438
Boron	mg/kg	N	7	5	17.1	36	22.7	23.1	23.36	30.75	--	--	--	N	N	2430	A, B	N	30.75
Cadmium	mg/kg	L	93	33	0.47	4.9	0.41	4.4	--	--	1.034	1.216	--	Y	--	27	G	N	1.216
Calcium	mg/kg	L	93	93	1620	252000	--	--	--	--	83986	124191	--	N	--	ND	A	N	124191
Chromium	mg/kg	L	93	91	3.6	36.2	5	7.7	--	--	15.06	16.77	--	Y	--	135	G	N	16.77
Cobalt	mg/kg	N	93	88	3	23.2	5	9.5	8.71	9.37	--	--	--	N	--	1620	A	N	9.369
Copper	mg/kg	L	93	91	7	436	7.7	9.3	--	--	25.90	29.81	--	Y	--	999	G	N	29.81
Cyanide	mg/kg	U	90	29	0.12	2.6	0.1	0.3	0.210	--	--	--	0.78	Y	--	540	G	N	0.780
Iron	mg/kg	N	93	93	3430	44100	--	--	17834	19229	--	--	--	N	--	ND	A	N	19229
Lead	mg/kg	L	93	93	3.3	1140	--	--	--	--	22.44	28.08	--	Y	--	ND		Y	28.08
Magnesium	mg/kg	N	93	93	377	55900	--	--	16545	18890	--	--	--	N	--	262000	A	N	18890
Manganese	mg/kg	N	93	93	22.7	1200	--	--	479.6	525.3	--	--	--	N	--	3780	A	N	525.3
Mercury	mg/kg	U	90	16	0.12	1.3	0.09	0.19	0.111	--	--	--	0.44	Y	--	8.1	G	N	0.440
Molybdenum	mg/kg	N	93	67	0.72	17.5	1.1	17.5	5.98	6.69	--	--	--	Y	--	135	G	N	6.694
Nickel	mg/kg	L	93	89	8.1	82.3	10.1	17.5	--	--	21.30	23.45	--	N	--	540	A	N	23.45
Potassium	mg/kg	L	93	93	456	2900	--	--	--	--	1163	1260	--	N	--	ND	A	N	1260
Selenium	mg/kg	U	87	18	0.73	11.1	0.2	0.53	0.804	--	--	--	4.1	N	--	135	A	N	4.100
Silicon	mg/kg	L	72	72	5.5	3370	--	--	--	--	846.7	992.1	--	N	--	ND	A	N	992.1
Silver	mg/kg	N	93	64	0.49	16.2	0.41	8.7	4.60	5.24	--	--	--	Y	--	135	G	N	5.244
Sodium	mg/kg	L	93	89	37.5	663	71.9	237	--	--	171.0	191.7	--	Y	--	ND	D	N	191.7
Thallium	mg/kg	U	93	14	0.19	3.6	0.16	0.59	0.316	--	--	--	0.88	N	--	1.89	A	N	0.880
Vanadium	mg/kg	N	93	93	9.8	53.2	--	--	26.16	27.68	--	--	--	Y	--	189	G	N	27.68
Zinc	mg/kg	L	93	91	9.4	508	11.9	12.9	--	--	56.96	66.44	--	N	--	8100	A	N	66.44
CS-137	pci/g	U	116	9	0.165	0.55	0.07	0.95	0.101	--	--	--	0.237	Y	--	--[i]		Y	0.237
GROSS ALPHA	pci/g	L	67	62	7.81	2030	8.72	10.9	--	--	67.52	98.89	--	•[f]	--	ND		N[h]	98.89
GROSS BETA	pci/g	L	67	67	12.41	1810	--	--	--	--	67.00	87.98	--	•	--	ND		N[h]	87.98
NP-237	pci/g	U	105	9	0.116	37.3	0.03	6.53	0.604	--	--	--	0.3	•	--	--		Y	0.300
PB-210	pci/g	L	10	10	0.71	16.8	--	--	--	--	2.398	6.014	--	Y	--	--		Y	6.014
PU-238	pci/g	U	121	8	0.024	0.6	0.016	1.85	0.175	--	--	--	0.04	•	--	--		Y	0.040
PU-239/240	pci/g	U	118	6	0.0209	1.23	0.01	1.77	0.165	--	--	--	0.0209	•	--	--		Y	0.021
RA-224	pci/g	N	10	10	1.02	3.49	--	--	2.68	3.13	--	--	--	Y	--	--		Y	3.133
RA-226	pci/g	L	116	111	0.492	42.3	0.3	1.04	--	--	2.427	2.919	--	Y	--	--		Y	2.919
RA-228	pci/g	L	115	111	0.34	19	0.442	0.54	--	--	1.485	1.656	--	Y	--	--		Y	1.656
RU-106	pci/g	U	116	11	1	1.8	0.104	8.95	0.561	--	--	--	1.3	Y	--	--		Y	1.300
SR-90	pci/g	U	113	37	0.5	2.39	0.15	0.963	0.478	--	--	--	1.36	N	--	--	A	N	1.360
TC-99	pci/g	U	90	4	0.9	1.1	0.207	0.9	0.279	--	--	--	0.9	N	--	--	A	N	0.900
TH-228	pci/g	L	111	102	0.308	20.3	0.33	0.88	--	--	1.493	1.704	--	Y	--	--		Y	1.704
TH-230	pci/g	L	111	111	0.8	121	--	--	--	--	3.562	4.263	--	Y	--	--		Y	4.263
TH-232	pci/g	L	111	99	0.264	17.5	0.29	0.979	--	--	1.341	1.531	--	Y	--	--		Y	1.531
TH-TOTAL	mg/kg	L	108	108	2.41	158	--	--	--	--	12.27	13.65	--	•	Y	ND		Y	13.65
U-234	pci/g	L	121	114	0.6	1380	0.49	2.59	--	--	19.01	30.19	--	Y	--	--		Y	30.19
U-235	pci/g	L	10	6	0.57	12.7	0.4	3.3	--	--	2.887	17.06	--	•	--	--		Y	12.70
U-235/236	pci/g	U	121	40	-0.04	68.8	0.0196	0.6	2.31	--	--	--	5.76	Y	--	--		Y	5.760
U-238	pci/g	L	121	117	0.385	1570	0.471	0.6	--	--	20.46	32.30	--	Y	--	--		Y	32.30
U-TOTAL	mg/kg	L	118	114	1.05	3580	2.62	31.72	--	--	69.22	104.4	--	•	--	81		Y	104.4
2-Methylnaphthalene	mg/kg	U	101	7	0.05	0.091	0.34	0.93	0.20321	--	--	--	0.056	--	--	ND		Y	0.056
4-Methylphenol	mg/kg	U	100	2	0.01	0.054	0.34	0.93	0.20919	--	--	--	0.01	--	--	0.016	G	N	0.01
Acenaphthylene	mg/kg	U	100	1	0.41	0.41	0.34	0.93	0.21505	--	--	--	0.41	--	--	8100	G	N	0.41
Anthracene	mg/kg	U	100	6	0.003	0.25	0.34	0.93	0.20536	--	--	--	0.049	--	--	8100	G	N	0.049
Benzo(a)anthracene	mg/kg	U	100	15	0.008	1.1	0.34	0.93	0.20563	--	--	--	0.13	--	--	0.0877		Y	0.13
Benzo(a)pyrene	mg/kg	U	99	13	0.003	1.8	0.34	0.93	0.21220	--	--	--	0.11	--	--	0.00877		Y	0.11

TABLE B.3.2-2(b)
Constituents of Potential Concern (CPCs)
South Field\Inactive Flyash Pile: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	NPar.95	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg pCi/g)	Reason for Elimin.[f]	Final CPC[d]	Conc. Term (mg/kg pCi/g)
Benzo(b)fluoranthene	mg/kg	U	99	13	0.005	1.6	0.34	0.93	0.21867	-	-	-	0.14	-	-	0.0877		Y	0.14
Benzo(g,h,i)perylene	mg/kg	U	99	9	0.004	1.2	0.34	0.93	0.21087	-	-	-	0.059	-	-	ND		Y	0.059
Benzo(k)fluoranthene	mg/kg	U	99	10	0.006	1.6	0.34	0.93	0.21475	-	-	-	0.084	-	-	0.877	G	N	0.084
Benzoic acid	mg/kg	U	82	11	0.044	0.15	1.7	4.2	0.90693	-	-	-	0.057	-	-	108000	G	N	0.057
Carbazole	mg/kg	U	73	2	0.001	0.051	0.34	0.57	0.19913	-	-	-	0.001	-	-	3.2	G	N	0.001
Chrysene	mg/kg	U	100	15	0.008	1.4	0.34	0.93	0.21011	-	-	-	0.15	-	-	8.77	G	N	0.15
Di-n-butyl phthalate	mg/kg	U	100	6	0.043	0.11	0.051	0.93	0.20212	-	-	-	0.046	-	-	2700	G	N	0.046
Di-n-octyl phthalate	mg/kg	U	100	1	0.21	0.21	0.34	0.93	0.2129	-	-	-	0.21	-	-	540	G	N	0.21
Dibenzo(a,h)anthracene	mg/kg	U	99	2	0.002	0.44	0.34	0.93	0.21320	-	-	-	0.002	-	-	0.00877	G	N	0.002
Diethyl phthalate	mg/kg	U	101	3	0.052	0.18	0.34	0.93	0.20976	-	-	-	0.052	-	-	21600	G	N	0.052
Fluoranthene	mg/kg	U	101	19	0.016	1.8	0.34	0.93	0.22246	-	-	-	0.26	-	-	1080	G	N	0.26
Indeno(1,2,3-cd)pyrene	mg/kg	U	99	7	0.004	0.21	0.34	0.93	0.20349	-	-	-	0.046	-	-	0.0877	G	N	0.046
Isophorone	mg/kg	U	100	1	0.004	0.004	0.34	0.93	0.21084	-	-	-	0.004	-	-	15.6	G	N	0.004
Naphthalene	mg/kg	U	100	4	0.053	0.081	0.34	0.93	0.20698	-	-	-	0.053	-	-	1080	G	N	0.053
Phenanthrene	mg/kg	U	100	18	0.01	0.37	0.34	0.93	0.1997	-	-	-	0.21	-	-	ND		Y	0.21
Phenol	mg/kg	U	100	1	0.002	0.002	0.34	0.93	0.21082	-	-	-	0.002	-	-	16200	G	N	0.002
Pyrene	mg/kg	U	103	22	0.014	1.4	0.34	0.93	0.21069	-	-	-	0.22	-	-	810	G	N	0.22
Tributyl phosphate	mg/kg	U	17	3	0.002	0.2	0.35	0.44	0.19041	-	-	-	0.2	-	-	ND		Y	0.2
bis(2-Ethylhexyl) phthalate	mg/kg	U	99	39	0.002	2.8	0.34	0.93	0.26883	-	-	-	0.86	-	-	4.57	G	N	0.86
1,1,1-Trichloroethane	mg/kg	U	102	19	0.001	0.92	0.005	1.6	0.02875	-	-	-	0.05	-	-	2430	G	N	0.05
2-Butanone	mg/kg	U	99	6	0.001	0.042	0.006	1.6	0.01562	-	-	-	0.002	-	-	16200	G	N	0.002
2-Hexanone	mg/kg	U	91	1	0.003	0.003	0.006	1.6	0.01592	-	-	-	0.003	-	-	1080	G	N	0.003
4-Methyl-2-pentanone	mg/kg	U	92	6	0.001	0.006	0.007	1.6	0.01565	-	-	-	0.001	-	-	1350	G	N	0.001
Acetone	mg/kg	U	100	34	0.003	0.19	0.01	1.6	0.02144	-	-	-	0.056	-	-	2700	G	N	0.056
Carbon disulfide	mg/kg	U	101	3	0.002	0.02	0.005	1.6	0.01415	-	-	-	0.002	-	-	2700	G	N	0.002
Chlorobenzene	mg/kg	U	90	1	0.014	0.014	0.005	1.6	0.01494	-	-	-	0.014	-	-	540	G	N	0.014
Chloroform	mg/kg	U	100	2	0.003	0.007	0.005	1.6	0.01419	-	-	-	0.003	-	-	10.5	G	N	0.003
Chloromethane	mg/kg	U	100	1	0.052	0.052	0.01	1.6	0.01563	-	-	-	0.052	-	-	4.92	G	N	0.052
Methylene chloride	mg/kg	U	101	9	0.002	0.18	0.005	0.089	0.01328	-	-	-	0.054	-	-	8.53	G	N	0.054
Styrene	mg/kg	U	91	1	0.002	0.002	0.005	1.6	0.01510	-	-	-	0.002	-	-	2.13	G	N	0.002
Tetrachloroethene	mg/kg	U	91	1	0.001	0.001	0.005	1.6	0.01504	-	-	-	0.001	-	-	1.23	G	N	0.001
Toluene	mg/kg	U	97	43	0.001	1.8	0.005	0.37	0.04526	-	-	-	0.11	-	-	5400	G	N	0.11
Trichloroethene	mg/kg	U	95	1	0.002	0.002	0.005	1.6	0.01467	-	-	-	0.002	-	-	5.82	G	N	0.002
Vinyl Acetate	mg/kg	U	87	1	0.002	0.002	0.01	0.083	0.00633	-	-	-	0.002	-	-	27000	G	N	0.002
Xylenes, Total	mg/kg	U	90	2	0.001	0.002	0.005	1.6	0.01521	-	-	-	0.001	-	-	54000	G	N	0.001
Total Organic Carbon	mg/kg	N	6	6	7.84	192.011	-	-	104.696	177.7503	-	-	0	-	-	ND	F	N	177.750329
Octachlorodibenzo-p-dioxin	mg/kg	L	10	10	0.00012	0.0036	-	-	-	-	0.00132501	0.004496	0	-	-	0.000427		Y	0.0036
Tetrachlorodibenzofuran	mg/kg	U	10	1	0.00001	0.000018	0.00002	0.00017	0.00002	-	-	-	0.000018	-	-	0.00000427		Y	0.000018
Arodor-1254	mg/kg	U	101	23	0.032	1.1	0.034	0.37	0.09114	-	-	-	0.43	-	-	0.00831		Y	0.43
Arodor-1260	mg/kg	U	101	2	0.089	0.39	0.034	1.8	0.06508	-	-	-	0.089	-	-	0.00831		Y	0.089
Dieldrin	mg/kg	U	100	1	0.016	0.016	0.0034	0.18	0.00643	-	-	-	0.016	-	-	0.004		Y	0.016
Endrin ketone	mg/kg	U	100	1	0.0053	0.0053	0.0034	0.18	0.00632	-	-	-	0.0053	-	-	8.1	G	N	0.0053
alpha-Chlordane	mg/kg	U	100	2	0.0033	0.008	0.0018	0.92	0.02514	-	-	-	0.0033	-	-	0.0492	G	N	0.0033
gamma-Chlordane	mg/kg	U	100	1	0.0072	0.0072	0.0018	0.92	0.02511	-	-	-	0.0072	-	-	0.0492	G	N	0.0072

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] - Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.

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TABLE B.3.2-2(b)
Constituents of Potential Concern (CPCs)
South Field\Inactive Flyash Pile: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	NPar.95	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg pCi/g)	Reason for Elimin.[f]	Final CPC[d]	Conc. Term (mg/kg pCi/g)

[a] No data available to calculate EPA RAGs, Part B screening value.

[f] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B.3.3-2(c)
Constituents of Potential Concern (CPCs)
South Field: Seeps

Parameter	Units	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Average	EPA RAGs[a] Residential Tap Water (mg/L)	Reason for Elimination[g]	Final CPC[b]	Conc. Term (mg/L; pCi/L)
Aluminum	mg/l	2	2	0.178	0.183	–[c]	–	0.1805	ND[d]	B	N	0.183
Barium	mg/l	2	2	0.0497	0.0544	–	–	0.05205	0.256	E	N	0.0544
Calcium	mg/l	2	2	103	109	–	–	106	ND	B	N	109
Magnesium	mg/l	2	2	30	38.2	–	–	34.1	35.4	B	N	38.2
Potassium	mg/l	2	2	1.05	1.27	–	–	1.16	ND	B	N	1.27
Silicon	mg/l	2	2	4.22	5.84	–	–	5.03	ND	C	N	5.84
Sodium	mg/l	2	2	4.26	5.05	–	–	4.655	ND	B	N	5.05
GROSS ALPHA	pci/l	2	2	205	224	–	–	214.5	ND		N[f]	224
GROSS BETA	pci/l	2	2	97	119	–	–	108.0	ND		N[f]	119
U-234	pci/l	2	2	110	159	–	–	134.5	--[e]		Y	159
U-235/236	pci/l	2	2	7.4	7.47	–	–	7.44	--		Y	7.47
U-238	pci/l	2	2	136	174	–	–	155.0	--		Y	174
U-TOTAL	mg/l	2	2	0.34	0.487	–	–	0.4135	0.0109		Y	0.487
Alkalinity	mg/l	2	2	315	355.3	–	–	335.2	ND	D	N	355.3
Chloride	mg/l	2	2	3.7	4.4	–	–	4.05	ND	C	N	4.4
Fluoride	mg/l	2	2	0.36	0.4	–	–	0.380	0.291	D	N	0.4
Phosphorus	mg/l	1	1	0.07	0.07	–	–	0.070	ND	D	N	0.07
Sulfate	mg/l	2	2	71.74	87.61	–	–	79.7	0.365	D	N	87.61
Total Kjeldahl Nitrogen	mg/l	2	2	0.22	0.35	–	–	0.285	ND	D	N	0.35
Total Organic Carbon	mg/l	2	2	2.44	3.44	–	–	2.94	ND	D	N	3.44
Total Organic Nitrogen	mg/l	2	2	0.22	0.35	–	–	0.285	ND	D	N	0.35
Total Phosphorous	mg/l	1	1	0.05	0.05	–	–	0.050	ND	D	N	0.05

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria A through E) presented below.
[c] Not applicable.
[d] No toxicity data available to calculate EPA RAGs screening value.
[e] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retained as CPCs.
[f] Quantitative risk assessment not possible; qualitative use only.
[g] Summary of Toxicological Screening Criteria:

(A) Constituent was identified only once in one medium (i.e., not found in any other media).
(B) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(C) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(D) Constituent is within a nonspecific class of chemical compounds (e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(E) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

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Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.499		2.8E-11	1.9E-11	2.0E-06				
NP-237	0.214		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.116		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.076		2.3E-10	3.8E-08	2.7E-11				
RA-226	30.800		7.8E-10	7.0E-09	6.0E-06				
RA-228	3.880		1.0E-10	6.9E-10	2.9E-06				
SR-90	1.600		3.6E-11	6.2E-11	0.0E+00				
TC-99	142.000		1.3E-12	8.3E-12	6.0E-13				
TH-228	4.410		5.5E-11	7.8E-08	5.6E-06				
TH-230	13.800		1.3E-11	2.9E-08	5.4E-11				
TH-232	3.990		1.7E-10	1.1E-07	8.5E-06				
U-234	8.656		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.887		1.6E-11	2.5E-08	2.4E-07				
U-238	9.311		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0.089	6.00E-02	7.70E+00			1.03E+01			
Aroclor-1260	0.052	6.00E-02	7.70E+00			1.03E+01			
Arsenic	7.268	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	5.500		7.30E-01	6.10E-01					
Benzo(a)pyrene	9.400		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	6.200		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	6.200	3.00E-01							
Benzo(k)fluoranthene	7.300		7.30E-02	6.10E-02					
Beryllium	0.942	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	24.580	1.00E-02							
Dibenzo(a,h)anthracen	1.900		7.30E+00	6.10E+00					
Dieldrin	0.010	6.00E-02	1.60E+01	1.60E+01		1.60E+01	5.00E-05		5.00E-05
Indeno(1,2,3-cd)pyren	6.000		7.30E-01	6.10E-01					
Phenanthrene	2.300	3.00E-01							
TH-Total	36.700	1.00E-02							

SOUTHFIELD

EXPOSURE POINT CONCENTRATIONS

SURFACE WATER (NON-GMR)									
	Current and Future								
Contaminant	onc'n (pCi/L	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	8.00E-01		2.2E-10						
PU-238	2.18E-02		2.2E-10						
RA-226	5.46E+00		7.8E-10						
RA-228	6.90E-01		1.0E-10						
SR-90	1.16E+00		3.6E-11						
TC-99	1.67E+04		1.3E-12						
U-234	1.40E+02		1.6E-11						
U-235/236	1.23E+01		1.6E-11						
U-238	1.51E+02		2.8E-11						
CHEM	(mg/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm
Arsenic	6.84E-04	1.0E-03	1.75E+00			########	3.00E-04		2.85E-04
Benzo(a)anth	1.42E-04	8.1E-01	7.30E-01	6.10E-01					
Benzo(a)pyre	1.02E-04	1.2E+00	7.30E+00	6.10E+00					
Benzo(b)fluor	1.72E-05	1.2E+00	7.30E-01	6.10E-01					
Benzo(g,h,i)p	4.87E-04	5.4E+00							
Beryllium	7.09E-05	1.0E-03	4.30E+00				5.00E-03		5.00E-05
Dibenzo(a,h)	2.10E-05	2.7E+00	7.30E+00	6.10E+00					
Dieldrin	3.13E-05	1.6E-02	1.60E+01	1.60E+01		########	5.00E-05		5.00E-05
Lead	1.22E-02	4.0E-06							
Phenanthrene	1.51E-01	2.3E-01							
U-Total	4.64E-01	1.0E-03					3.00E-03		1.50E-04

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SOUTHFIELD

EXPOSURE POINT CONCENTRATIONS

AIR					
	CURRENT(& future fed ownrshp; off-p		*FUTURE; 85% veg; lim. erosion*	*FUTURE; 50% veg; unlim. erosio*	*FUTURE; 50% ve*
	On-Subunit	Off-Prop	On-Subunit [EX TRESP]	On-Subunit [FARM]	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m3)	Conc'n (pCi/m3)	onc'n (pCi/m3
CS-137	4.94E-06	3.65E-07	4.94E-06	1.78E-04	1.30E-05
NP-237	2.12E-06	1.57E-07	2.12E-06	7.64E-05	5.56E-06
PU-238	1.15E-06	8.49E-08	1.15E-06	4.14E-05	3.02E-06
PU-239/240	7.53E-07	5.56E-08	7.53E-07	2.71E-05	1.98E-06
RA-226	3.05E-04	2.25E-05	3.05E-04	1.10E-02	8.01E-04
RA-228	3.84E-05	2.84E-06	3.84E-05	1.38E-03	1.01E-04
SR-90	1.59E-05	1.17E-06	1.59E-05	5.71E-04	4.16E-05
TC-99	1.41E-03	1.04E-04	1.41E-03	5.07E-02	3.69E-03
TH-228	4.37E-05	3.23E-06	4.37E-05	1.57E-03	1.15E-04
TH-230	1.37E-04	1.01E-05	1.37E-04	4.93E-03	3.59E-04
TH-232	3.95E-05	2.92E-06	3.95E-05	1.42E-03	1.04E-04
U-234	8.57E-05	6.33E-06	8.57E-05	3.09E-03	2.25E-04
U-235/236	8.80E-06	6.49E-07	8.80E-06	3.17E-04	2.31E-05
U-238	9.22E-05	6.81E-06	9.22E-05	3.32E-03	2.42E-04
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3
Aroclor-1254	8.81E-10	6.51E-11	8.81E-10	3.18E-08	2.31E-09
Aroclor-1260	5.15E-10	3.80E-11	5.15E-10	1.86E-08	1.35E-09
Arsenic	7.20E-08	5.32E-09	7.20E-08	2.59E-06	1.89E-07
Benzo(a)anthracene	5.45E-08	4.02E-09	5.45E-08	1.96E-06	1.43E-07
Benzo(a)pyrene	9.31E-08	6.88E-09	9.31E-08	3.36E-06	2.44E-07
Benzo(b)fluoranthene	6.14E-08	4.54E-09	6.14E-08	2.21E-06	1.61E-07
Benzo(g,h,i)perylene	6.15E-08	4.54E-09	6.15E-08	2.21E-06	1.61E-07
Benzo(k)fluoranthene	7.23E-08	5.34E-09	7.23E-08	2.61E-06	1.90E-07
Beryllium	9.33E-09	6.89E-10	9.33E-09	3.36E-07	2.45E-08
Lead	2.43E-07	1.80E-08	2.43E-07	8.78E-06	6.39E-07
Dibenzo(a,h)anthracene	1.88E-08	1.39E-09	1.88E-08	6.78E-07	4.94E-08
Dieldrin	9.90E-11	7.32E-12	9.90E-11	3.57E-09	2.60E-10
Indeno(1,2,3-cd)pyrene	5.94E-08	4.39E-09	5.94E-08	2.14E-06	1.56E-07
Phenanthrene	2.28E-08	1.68E-09	2.28E-08	8.21E-07	5.98E-08
TH-Total	3.64E-07	2.69E-08	3.64E-07	1.31E-05	9.54E-07

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SEDIMENT								
; unlim. erosion (ofrf pri	Current and Future							
Contaminant	onc'n (pCi/g)		SF(o)	SF(e)				
NP-237	2.10E-01		2.2E-10	4.3E-07				
PU-238	0.116		2.2E-10	2.8E-11				
RA-226	30.8		7.8E-10	6.0E-06				
RA-228	3.89		1.0E-10	2.9E-06				
SR-90	0.155		3.6E-11	0.0E+00				
TC-99	61.9		1.3E-12	6.0E-13				
U-234	8.15		1.6E-11	3.0E-11				
U-235/236	0.838		1.6E-11	2.4E-07				
U-238	8.77		2.8E-11	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Benzo(a)pyrene	9.4		7.30E+00					
Benzo(b)fluoranthene	6.2		7.30E-01					
Benzo(g,h,i)perylene	6.2	3.00E-01						
Arsenic	7.27	1.00E-03	1.75E+00		1.84E+00	3.00E-04		2.85E-04
Beryllium	0.942	1.00E-02	4.30E+00			5.00E-03		5.00E-05
Lead	24.5	1.00E-02						
U-TOTAL	2.79E+01	1.00E-02				3.00E-03		1.50E-04
Benzo(a)anthracene	5.5		7.30E-01					
Dieldrin	9.55E-03	6.00E-02	16			5.00E-05		5.00E-05
Dibenzo(a,h)anthracen	1.9		7.3					
Phenanthrene	2.3	3.00E-01						

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SOUTHFIELD

EXPOSURE POINT CONCENTRATIONS

SUBSURFACE SOIL										GROUNDWATER									
											On-Site	@ Bdry							
Contaminant	Conc'n (pCi/g)		SF(o)	SF(i)	SF(e)					Contaminant	onc'n (pCi/L	onc'n (pCi/L)		SF(o)		SF (derm)			
CS-137	0.237		2.8E-11	1.9E-11	2.0E-06					NP-237	1.90E-02	2.81E-04		2.2E-10					
NP-237	0.3		2.2E-10	2.9E-08	4.3E-07					SR-90	2.72E-02	2.26E-03		3.6E-11					
PB-210	6.014		6.6E-10	4.0E-09	1.6E-10					TC-99	1.82E+00	9.81E-01		1.3E-12					
PU-238	0.04		2.2E-10	3.9E-08	2.8E-11					U-234	4.69E+02	2.40E+01		1.6E-11					
PU-239/240	0.021		2.3E-10	3.8E-08	2.7E-11					U-235/236	2.50E+01	1.28E+00		1.6E-11					
RA-224	3.133		3.8E-11	1.2E-09	2.3E-08					U-238	5.17E+02	2.65E+01		2.8E-11					
RA-226	2.919		7.8E-10	7.0E-09	6.0E-06														
RA-228	1.656		1.0E-10	6.9E-10	2.9E-06														
RU-106	1.3		9.5E-12	4.4E-10	0.0E+00														
TH-228	1.704		5.5E-11	7.8E-08	5.6E-06														
TH-230	4.263		1.3E-11	2.9E-08	5.4E-11														
TH-232	1.531		1.7E-10	1.1E-07	8.5E-06														
U-234	30.19		1.6E-11	2.6E-08	3.0E-11														
U-235/236	5.76		1.6E-11	2.5E-08	2.4E-07														
U-238	32.3		2.8E-11	5.2E-08	3.6E-08					CHEM	(mg/L)	(mg/L)	Kp	SF(o)	SF(i)	SF (derm)	RfD(o)	RfD(i	RfD(derm)
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)	2-Methylnaphthalene	7.17E-04	0.00E+00	1.42E-01						
Aroclor-1254	0.43	6.00E-02	7.70E+00			1.03E+01				Lead	1.43E-03	2.05E-17	4.00E-06						
Aroclor-1260	0.089	6.00E-02	7.70E+00			1.03E+01				Tributyl phosphate	1.43E-03	0.00E+00	3.14E-02				5.00E-03		4.50E-03
Arsenic	12.06	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04	U-Total	1.84E+00	9.45E-02	1.00E-03				3.00E-03		1.50E-04
Benzo(a)anthracene	0.13		7.30E-01	6.10E-01															
Benzo(a)pyrene	0.11		7.30E+00	6.10E+00															
Benzo(b)fluoranthene	0.14		7.30E-01	6.10E-01															
Benzo(g,h,i)perylene	0.059	3.00E-01																	
Beryllium	1.438	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05										
Lead	28.08	1.00E-02																	
Dieldrin	0.016	6.00E-02	1.60E+01	1.60E+01			5.00E-05		5.00E-05										
Phenanthrene	0.21	3.00E-01																	
Tributyl Phosphate	0.2	3.00E-01					5.00E-03		4.50E-03										
Octachlorodibenzo-p-dioxin	3.60E-03	3.00E-02	1.50E+02	1.50E+02		3.00E+02													
Tetrachlorodibenzofuran	1.80E-05	3.00E-02	1.50E+04	1.50E+04		3.00E+04													
TH-Total	13.65	1.00E-02																	
U-Total	104.4	1.00E-02					3.00E-03		1.50E-04										

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SOUTHFIELD

EXPOSURE POINT CONCENTRATIONS

GMR SURFACE WATER									
Contaminant	onc'n (pCi/L	BCF	SF(o)	SF(i)	SF(e)				
NP-237	2.41E-05	1.00E+01	2.2E-10	2.9E-08	4.3E-07				
PU-238	6.63E-07	2.50E+01	2.2E-10	3.9E-08	2.8E-11				
RA-226	1.66E-04	5.00E+01	7.8E-10	7.0E-09	6.0E-06				
RA-228	2.10E-05	5.00E+01	1.0E-10	6.9E-10	2.9E-06				
SR-90	3.54E-03	3.00E+01	3.6E-11	6.2E-11	0.0E+00				
TC-99	5.06E-01	1.50E+01	1.3E-12	8.3E-12	6.0E-13				
U-234	4.17E-03	2.00E+00	1.6E-11	2.6E-08	3.0E-11				
U-235/236	3.65E-04	2.00E+00	1.6E-11	2.5E-08	2.4E-07				
U-238	4.51E-03	2.00E+00	2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/L)	BCF	Kp	SF(o)	SF(i)	SF(derm)	RfD(o)	RfD(i	RfD(derm)
Arsenic	2.08E-08	4.40E+01	1.00E-03	1.75E+00		1.84E+00	3.00E-04		2.85E-04
Beryllium	2.15E-09	1.90E+01	1.00E-03	4.30E+00			5.00E-03		5.00E-05
Lead	3.69E-07	4.90E+01	4.00E-06						
Nickel	2.44E-08	4.70E+01	1.00E-03						
Benzo(a)anthracene	4.32E-09	1.18E+03	8.10E-01	7.30E-01	6.10E-01				
Benzo(a)pyrene	3.09E-09	2.55E+04	1.20E+00	7.30E+00	6.10E+00				
Benzo(b)fluoranthene	5.24E-10	2.64E+04	1.20E+00	7.30E-01	6.10E-01				
Benzo(g,h,i)perylene	1.48E-08	1.84E+05	5.37E+00						
bis(2-Ethylhexyl)phthalate	3.45E-08		6.23E-03	1.40E-02		1.40E-02			
Dibenzo(a,h)anthracene	6.39E-10	9.30E+04	2.70E+00	7.30E+00	6.10E+00				
Dieldrin	9.50E-10		1.60E-02	1.60E+01	1.60E+01	1.60E+01	5.00E-05		5.00E-05
U-TOTAL	1.39E-05	2.00E-03	1.00E-03				3.00E-03		1.50E-04
Phenanthrene	4.61E-06	1.75E+03	2.30E-01						

TABLE B.3.2-4
CURRENT, TRESPASSING YOUTH
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	4.9E-06	1.0E-02	1.9E-11	1.9E-13
NP-237	2.1E-06	4.4E-03	2.9E-08	1.3E-10
PU-238	1.2E-06	2.4E-03	3.9E-08	9.3E-11
PU-239/240	7.5E-07	1.6E-03	3.8E-08	5.9E-11
RA-226	3.1E-04	6.3E-01	7.0E-09	4.4E-09
RA-228	3.8E-05	8.0E-02	6.9E-10	5.5E-11
SR-90	1.6E-05	3.3E-02	6.2E-11	2.0E-12
TC-99	1.4E-03	2.9E+00	8.3E-12	2.4E-11
TH-228	4.4E-05	9.1E-02	7.8E-08	7.1E-09
TH-230	1.4E-04	2.8E-01	2.9E-08	8.2E-09
TH-232	4.0E-05	8.2E-02	1.1E-07	9.0E-09
U-234	8.6E-05	1.8E-01	2.6E-08	4.6E-09
U-235/236	8.8E-06	1.8E-02	2.5E-08	4.6E-10
U-238	9.2E-05	1.9E-01	5.2E-08	9.9E-09
			Total Pathway:	4.4E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.50	5.9E+00	2.8E-11	1.7E-10
NP-237	0.21	2.5E+00	2.2E-10	5.6E-10
PU-238	0.12	1.4E+00	2.2E-10	3.0E-10
PU-239/240	0.08	9.0E-01	2.3E-10	2.1E-10
RA-226	30.80	3.7E+02	7.8E-10	2.8E-07
RA-228	3.88	4.6E+01	1.0E-10	4.6E-09
SR-90	1.60	1.9E+01	3.6E-11	6.8E-10
TC-99	142	1.7E+03	1.3E-12	2.2E-09
TH-228	4.41	5.2E+01	5.5E-11	2.9E-09
TH-230	13.80	1.6E+02	1.3E-11	2.1E-09
TH-232	3.99	4.7E+01	1.7E-10	8.0E-09
U-234	8.66	1.0E+02	1.6E-11	1.6E-09
U-235/236	0.89	1.1E+01	1.6E-11	1.7E-10
U-238	9.31	1.1E+02	2.8E-11	3.1E-09
			Total Pathway:	3.1E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Consubc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	8.81E-10	1.7E-12		
Aroclor-1260	5.15E-10	9.7E-13		
Arsenic	7.20E-08	1.4E-10	1.5E+01	2.0E-09
Benzo(a)anthracene	5.45E-08	1.0E-10	6.1E-01	6.3E-11
Benzo(a)pyrene	9.31E-08	1.8E-10	6.1E+00	1.1E-09
Benzo(b)fluoranthene	6.14E-08	1.2E-10	6.1E-01	7.1E-11
Benzo(g,h,i)perylene	6.15E-08	1.2E-10		
Benzo(k)fluoranthene	7.23E-08	1.4E-10	6.1E-02	8.3E-12
Beryllium	9.33E-09	1.8E-11	8.4E+00	1.5E-10
Lead	2.43E-07	4.6E-10		
Dibenzo(a,h)anthracene	1.88E-08	3.5E-11	6.1E+00	2.2E-10
Dieldrin	9.90E-11	1.9E-13	1.6E+01	3.0E-12
Indeno(1,2,3-cd)pyrene	5.94E-08	1.1E-10	6.1E-01	6.8E-11
Phenanthrene	2.28E-08	4.3E-11		
TH-Total	3.64E-07	6.9E-10		
			Total Pathway:	3.7E-09
			Total Rad + Chem	4.8E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.09	9.6E-10	7.7E+00	7.4E-09
Aroclor-1260	0.05	5.6E-10	7.7E+00	4.3E-09
Arsenic	7.27	7.8E-08	1.8E+00	1.4E-07
Benzo(a)anthracene	5.50	5.9E-08	7.3E-01	4.3E-08
Benzo(a)pyrene	9.40	1.0E-07	7.3E+00	7.4E-07
Benzo(b)fluoranthene	6.20	6.7E-08	7.3E-01	4.9E-08
Benzo(g,h,i)perylene	6.20	6.7E-08		
Benzo(k)fluoranthene	7.30	7.9E-08	7.3E-02	5.8E-09
Beryllium	0.94	1.0E-08	4.3E+00	4.4E-08
Lead	24.58	2.7E-07		
Dibenzo(a,h)anthracene	1.90	2.1E-08	7.3E+00	1.5E-07
Dieldrin	0.01	1.1E-10	1.6E+01	1.7E-09
Indeno(1,2,3-cd)pyrene	6.00	6.5E-08	7.3E-01	4.7E-08
Phenanthrene	2.30	2.5E-08		
TH-Total	36.70	4.0E-07		
			Total Pathway:	1.2E-06
			Total Rad + Chem	1.5E-06

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TABLE B.3.2-4
CURRENT, TRESPASSING YOUTH
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	4.9E-06	1.0E-02	1.9E-11	1.9E-13
NP-237	2.1E-06	4.4E-03	2.9E-08	1.3E-10
PU-238	1.2E-06	2.4E-03	3.9E-08	9.3E-11
PU-239/240	7.5E-07	1.6E-03	3.8E-08	5.9E-11
RA-226	3.1E-04	6.3E-01	7.0E-09	4.4E-09
RA-228	3.8E-05	8.0E-02	6.9E-10	5.5E-11
SR-90	1.6E-05	3.3E-02	6.2E-11	2.0E-12
TC-99	1.4E-03	2.9E+00	8.3E-12	2.4E-11
TH-228	4.4E-05	9.1E-02	7.8E-08	7.1E-09
TH-230	1.4E-04	2.8E-01	2.9E-08	8.2E-09
TH-232	4.0E-05	8.2E-02	1.1E-07	9.0E-09
U-234	8.6E-05	1.8E-01	2.6E-08	4.6E-09
U-235/236	8.8E-06	1.8E-02	2.5E-08	4.6E-10
U-238	9.2E-05	1.9E-01	5.2E-08	9.9E-09
			Total Pathway:	4.4E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.50	5.9E+00	2.8E-11	1.7E-10
NP-237	0.21	2.5E+00	2.2E-10	5.6E-10
PU-238	0.12	1.4E+00	2.2E-10	3.0E-10
PU-239/240	0.08	9.0E-01	2.3E-10	2.1E-10
RA-226	30.80	3.7E+02	7.8E-10	2.8E-07
RA-228	3.88	4.6E+01	1.0E-10	4.6E-09
SR-90	1.60	1.9E+01	3.6E-11	6.8E-10
TC-99	142	1.7E+03	1.3E-12	2.2E-09
TH-228	4.41	5.2E+01	5.5E-11	2.9E-09
TH-230	13.80	1.6E+02	1.3E-11	2.1E-09
TH-232	3.99	4.7E+01	1.7E-10	8.0E-09
U-234	8.66	1.0E+02	1.6E-11	1.6E-09
U-235/236	0.89	1.1E+01	1.6E-11	1.7E-10
U-238	9.31	1.1E+02	2.8E-11	3.1E-09
			Total Pathway:	3.1E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Consubc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	8.81E-10	1.7E-12		
Aroclor-1260	5.15E-10	9.7E-13		
Arsenic	7.20E-08	1.4E-10	1.5E+01	2.0E-09
Benzo(a)anthracene	5.45E-08	1.0E-10	6.1E-01	6.3E-11
Benzo(a)pyrene	9.31E-08	1.8E-10	6.1E+00	1.1E-09
Benzo(b)fluoranthene	6.14E-08	1.2E-10	6.1E-01	7.1E-11
Benzo(g,h,i)perylene	6.15E-08	1.2E-10		
Benzo(k)fluoranthene	7.23E-08	1.4E-10	6.1E-02	8.3E-12
Beryllium	9.33E-09	1.8E-11	8.4E+00	1.5E-10
Lead	2.43E-07	4.6E-10		
Dibenzo(a,h)anthracene	1.88E-08	3.5E-11	6.1E+00	2.2E-10
Dieldrin	9.90E-11	1.9E-13	1.6E+01	3.0E-12
Indeno(1,2,3-cd)pyrene	5.94E-08	1.1E-10	6.1E-01	6.8E-11
Phenanthrene	2.28E-08	4.3E-11		
TH-Total	3.64E-07	6.9E-10		
			Total Pathway:	3.7E-09
			Total Rad + Chem	4.8E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.09	9.6E-10	7.7E+00	7.4E-09
Aroclor-1260	0.05	5.6E-10	7.7E+00	4.3E-09
Arsenic	7.27	7.8E-08	1.8E+00	1.4E-07
Benzo(a)anthracene	5.50	5.9E-08	7.3E-01	4.3E-08
Benzo(a)pyrene	9.40	1.0E-07	7.3E+00	7.4E-07
Benzo(b)fluoranthene	6.20	6.7E-08	7.3E-01	4.9E-08
Benzo(g,h,i)perylene	6.20	6.7E-08		
Benzo(k)fluoranthene	7.30	7.9E-08	7.3E-02	5.8E-09
Beryllium	0.94	1.0E-08	4.3E+00	4.4E-08
Lead	24.58	2.7E-07		
Dibenzo(a,h)anthracene	1.90	2.1E-08	7.3E+00	1.5E-07
Dieldrin	0.01	1.1E-10	1.6E+01	1.7E-09
Indeno(1,2,3-cd)pyrene	6.00	6.5E-08	7.3E-01	4.7E-08
Phenanthrene	2.30	2.5E-08		
TH-Total	36.70	4.0E-07		
			Total Pathway:	1.2E-06
			Total Rad + Chem	1.5E-06

TABLE B.3.2-4
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	1.1E-01	2.0E-06	2.1E-07	2.1E-07
	NP-237	4.6E-02	4.3E-07	2.0E-08	2.0E-08
	PU-238	2.5E-02	2.8E-11	6.9E-13	4.0E-10
	PU-239/24	1.6E-02	2.7E-11	4.4E-13	2.7E-10
	RA-226	6.6E+00	6.0E-06	3.9E-05	4.0E-05
	RA-228	8.3E-01	2.9E-06	2.4E-06	2.4E-06
	SR-90	3.4E-01			6.8E-10
	TC-99	3.0E+01	6.0E-13	1.8E-11	2.2E-09
	TH-228	9.4E-01	5.6E-06	5.3E-06	5.3E-06
	TH-230	2.9E+00	5.4E-11	1.6E-10	1.1E-08
	TH-232	8.5E-01	8.5E-06	7.2E-06	7.3E-06
	U-234	1.8E+00	3.0E-11	5.5E-11	6.3E-09
	U-235/236	1.9E-01	2.4E-07	4.5E-08	4.6E-08
	U-238	2.0E+00	3.6E-08	7.2E-08	8.5E-08
Total Pathway:			Total Pathway:	5.5E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	1.3E-08	1.0E+01	1.3E-07					1.4E-07
Aroclor-1260	7.4E-09	1.0E+01	7.6E-08					8.1E-08
Arsenic	1.7E-08	1.8E+00	3.2E-08					1.7E-07
Benzo(a)anthracene			8.7E-08					1.3E-07
Benzo(a)pyrene			1.5E-06					2.2E-06
Benzo(b)fluoranthene			9.8E-08					1.5E-07
Benzo(g,h,i)perylene	4.4E-06							
Benzo(k)fluoranthene			1.2E-08					1.7E-08
Beryllium	2.2E-08		8.7E-08					1.3E-07
Lead	5.9E-07			Not applicable				
Dibenzo(a,h)anthracene			3.0E-07					4.5E-07
Dieldrin	1.4E-09	1.6E+01	2.3E-08					2.5E-08
Indeno(1,2,3-cd)pyrene			9.5E-08					1.4E-07
Phenanthrene	1.6E-06							
TH-Total	8.8E-07							
Total Pathway:			2.4E-06	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.4E-06 5.5E-05 *Total:* 5.9E-05

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TABLE B.3.2-4
(continued)
SOUTH FIELD: SURFACE SOIL
Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	4.94E-06	1.0E-02		
NP-237	2.12E-06	4.4E-03		
PU-238	1.15E-06	2.4E-03		
PU-239/240	7.53E-07	1.6E-03		
RA-226	3.05E-04	6.3E-01		
RA-228	3.84E-05	8.0E-02		
SR-90	1.59E-05	3.3E-02		
TC-99	1.41E-03	2.9E+00		
TH-228	4.37E-05	9.1E-02		
TH-230	1.37E-04	2.8E-01		
TH-232	3.95E-05	8.2E-02		
U-234	8.57E-05	1.8E-01		
U-235/236	8.80E-06	1.8E-02		
U-238	9.22E-05	1.9E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	0.50	5.9E+00		
NP-237	0.21	2.5E+00		
PU-238	0.12	1.4E+00		
PU-239/240	0.08	9.0E-01		
RA-226	30.80	3.7E+02		
RA-228	3.88	4.6E+01		
SR-90	1.60	1.9E+01		
TC-99	142.00	1.7E+03		
TH-228	4.41	5.2E+01		
TH-230	13.80	1.6E+02		
TH-232	3.99	4.7E+01		
U-234	8.66	1.0E+02		
U-235/236	0.89	1.1E+01		
U-238	9.31	1.1E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.81E-10	9.7E-12		
Aroclor-1260	5.15E-10	5.7E-12		
Arsenic	7.20E-08	7.9E-10		
Benzo(a)anthracene	5.45E-08	6.0E-10		
Benzo(a)pyrene	9.31E-08	1.0E-09		
Benzo(b)fluoranthene	6.14E-08	6.8E-10		
Benzo(g,h,i)perylene	6.15E-08	6.8E-10		
Benzo(k)fluoranthene	7.23E-08	8.0E-10		
Beryllium	9.33E-09	1.0E-10		
Lead	2.43E-07	2.7E-09		
Dibenzo(a,h)anthracene	1.88E-08	2.1E-10		
Dieldrin	9.90E-11	1.1E-12		
Indeno(1,2,3-cd)pyrene	5.94E-08	6.5E-10		
Phenanthrene	2.28E-08	2.5E-10		
TH-Total	3.64E-07	4.0E-09		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	0.09	5.6E-09		
Aroclor-1260	0.05	3.3E-09		
Arsenic	7.27	4.6E-07	3.0E-04	1.5E-03
Benzo(a)anthracene	5.50	3.5E-07		
Benzo(a)pyrene	9.40	5.9E-07		
Benzo(b)fluoranthene	6.20	3.9E-07		
Benzo(g,h,i)perylene	6.20	3.9E-07		
Benzo(k)fluoranthene	7.30	4.6E-07		
Beryllium	0.94	5.9E-08	5.0E-03	1.2E-05
Lead	24.58	1.5E-06		
Dibenzo(a,h)anthracene	1.90	1.2E-07		
Dieldrin	0.01	6.3E-10	5.0E-05	1.3E-05
Indeno(1,2,3-cd)pyrene	6.00	3.8E-07		
Phenanthrene	2.30	1.4E-07		
TH-Total	36.70	2.3E-06		

Total Pathway: 1.5E-03

Total Rad + Chem 1.5E-03

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TABLE B.3.2-4
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	1.1E-01		
	NP-237	4.6E-02		
	PU-238	2.5E-02		
	PU-239/240	1.6E-02		
	RA-226	6.6E+00		
	RA-228	8.3E-01		
	SR-90	3.4E-01		
	TC-99	3.0E+01		
	TH-228	9.4E-01		
	TH-230	2.9E+00		
	TH-232	8.5E-01		
	U-234	1.8E+00		
	U-235/236	1.9E-01		
	U-238	2.0E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	7.4E-08							
Aroclor-1260	4.3E-08							
Arsenic	1.0E-07	2.9E-04	3.5E-04					1.9E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.6E-05							
Benzo(k)fluoranthene								
Beryllium	1.3E-07	5.0E-05	2.6E-03					2.6E-03
Lead	3.4E-06			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin	8.3E-09	5.0E-05	1.7E-04					1.8E-04
Indeno(1,2,3-cd)pyrene								
Phenanthrene	9.6E-06							
TH-Total	5.1E-06							
		Total Pathway:	3.1E-03			Total Pathway:		
		Total Rad + Chem	3.1E-03					*otal:* 4.7E-03

TABLE B.3.2-4
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil				External Radiation/Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable				CS-137	1.1E-01	2.0E-06	2.1E-07	2.1E-07
				NP-237	4.6E-02	4.3E-07	2.0E-08	2.0E-08
				PU-238	2.5E-02	2.8E-11	6.9E-13	4.0E-10
				PU-239/24	1.6E-02	2.7E-11	4.4E-13	2.7E-10
				RA-226	6.6E+00	6.0E-06	3.9E-05	4.0E-05
				RA-228	8.3E-01	2.9E-06	2.4E-06	2.4E-06
				SR-90	3.4E-01			6.8E-10
				TC-99	3.0E+01	6.0E-13	1.8E-11	2.2E-09
				TH-228	9.4E-01	5.6E-06	5.3E-06	5.3E-06
				TH-230	2.9E+00	5.4E-11	1.6E-10	1.1E-08
				TH-232	8.5E-01	8.5E-06	7.2E-06	7.3E-06
				U-234	1.8E+00	3.0E-11	5.5E-11	6.3E-09
				U-235/236	1.9E-01	2.4E-07	4.5E-08	4.6E-08
				U-238	2.0E+00	3.6E-08	7.2E-08	8.5E-08
Total Pathway:				Total Pathway:			5.5E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	1.3E-08	1.0E+01	1.3E-07					1.4E-07
Aroclor-1260	7.4E-09	1.0E+01	7.6E-08					8.1E-08
Arsenic	1.7E-08	1.8E+00	3.2E-08					1.7E-07
Benzo(a)anthracene			8.7E-08					1.3E-07
Benzo(a)pyrene			1.5E-06					2.2E-06
Benzo(b)fluoranthene			9.8E-08					1.5E-07
Benzo(g,h,i)perylene	4.4E-06							
Benzo(k)fluoranthene			1.2E-08					1.7E-08
Beryllium	2.2E-08		8.7E-08					1.3E-07
Lead	5.9E-07			Not applicable				
Dibenzo(a,h)anthracene			3.0E-07					4.5E-07
Dieldrin	1.4E-09	1.6E+01	2.3E-08					2.5E-08
Indeno(1,2,3-cd)pyrene			9.5E-08					1.4E-07
Phenanthrene	1.6E-06							
TH-Total	8.8E-07							
Total Pathway:			2.4E-06	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.4E-06 5.5E-05 *Total:* 5.9E-05

TABLE B.3.2-4
(continued)
SOUTH FIELD: SURFACE SOIL
Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	4.94E-06	1.0E-02		
NP-237	2.12E-06	4.4E-03		
PU-238	1.15E-06	2.4E-03		
PU-239/240	7.53E-07	1.6E-03		
RA-226	3.05E-04	6.3E-01		
RA-228	3.84E-05	8.0E-02		
SR-90	1.59E-05	3.3E-02		
TC-99	1.41E-03	2.9E+00		
TH-228	4.37E-05	9.1E-02		
TH-230	1.37E-04	2.8E-01		
TH-232	3.95E-05	8.2E-02		
U-234	8.57E-05	1.8E-01		
U-235/236	8.80E-06	1.8E-02		
U-238	9.22E-05	1.9E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	0.50	5.9E+00		
NP-237	0.21	2.5E+00		
PU-238	0.12	1.4E+00		
PU-239/240	0.08	9.0E-01		
RA-226	30.80	3.7E+02		
RA-228	3.88	4.6E+01		
SR-90	1.60	1.9E+01		
TC-99	142.00	1.7E+03		
TH-228	4.41	5.2E+01		
TH-230	13.80	1.6E+02		
TH-232	3.99	4.7E+01		
U-234	8.66	1.0E+02		
U-235/236	0.89	1.1E+01		
U-238	9.31	1.1E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.81E-10	9.7E-12		
Aroclor-1260	5.15E-10	5.7E-12		
Arsenic	7.20E-08	7.9E-10		
Benzo(a)anthracene	5.45E-08	6.0E-10		
Benzo(a)pyrene	9.31E-08	1.0E-09		
Benzo(b)fluoranthene	6.14E-08	6.8E-10		
Benzo(g,h,i)perylene	6.15E-08	6.8E-10		
Benzo(k)fluoranthene	7.23E-08	8.0E-10		
Beryllium	9.33E-09	1.0E-10		
Lead	2.43E-07	2.7E-09		
Dibenzo(a,h)anthracene	1.88E-08	2.1E-10		
Dieldrin	9.90E-11	1.1E-12		
Indeno(1,2,3-cd)pyrene	5.94E-08	6.5E-10		
Phenanthrene	2.28E-08	2.5E-10		
TH-Total	3.64E-07	4.0E-09		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	0.09	5.6E-09		
Aroclor-1260	0.05	3.3E-09		
Arsenic	7.27	4.6E-07	3.0E-04	1.5E-03
Benzo(a)anthracene	5.50	3.5E-07		
Benzo(a)pyrene	9.40	5.9E-07		
Benzo(b)fluoranthene	6.20	3.9E-07		
Benzo(g,h,i)perylene	6.20	3.9E-07		
Benzo(k)fluoranthene	7.30	4.6E-07		
Beryllium	0.94	5.9E-08	5.0E-03	1.2E-05
Lead	24.58	1.5E-06		
Dibenzo(a,h)anthracene	1.90	1.2E-07		
Dieldrin	0.01	6.3E-10	5.0E-05	1.3E-05
Indeno(1,2,3-cd)pyrene	6.00	3.8E-07		
Phenanthrene	2.30	1.4E-07		
TH-Total	36.70	2.3E-06		

Total Pathway: 1.5E-03

Total Rad + Chem 1.5E-03

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TABLE B.3.2-4
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	1.1E-01		
	NP-237	4.6E-02		
	PU-238	2.5E-02		
	PU-239/240	1.6E-02		
	RA-226	6.6E+00		
	RA-228	8.3E-01		
	SR-90	3.4E-01		
	TC-99	3.0E+01		
	TH-228	9.4E-01		
	TH-230	2.9E+00		
	TH-232	8.5E-01		
	U-234	1.8E+00		
	U-235/236	1.9E-01		
	U-238	2.0E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	7.4E-08							
Aroclor-1260	4.3E-08							
Arsenic	1.0E-07	2.9E-04	3.5E-04					1.9E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.6E-05							
Benzo(k)fluoranthene								
Beryllium	1.3E-07	5.0E-05	2.6E-03					2.6E-03
Lead	3.4E-06				Not applicable			
Dibenzo(a,h)anthracene								
Dieldrin	8.3E-09	5.0E-05	1.7E-04					1.8E-04
Indeno(1,2,3-cd)pyrene								
Phenanthrene	9.6E-06							
TH-Total	5.1E-06							
		Total Pathway:	3.1E-03			Total Pathway:		
		Total Rad + Chem	3.1E-03					otal: 4.7E-03

TABLE B.3.2-5
CURRENT, TRESPASSING YOUTH
SOUTH FIELD: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	8.00E-01	1.7E+01	2.2E-10	3.8E-09		3.8E-09
PU-238	2.18E-02	4.8E-01	2.2E-10	1.0E-10	Not applicable	1.0E-10
RA-226	5.46E+00	1.2E+02	7.8E-10	9.3E-08		9.3E-08
RA-228	6.90E-01	1.5E+01	1.0E-10	1.5E-09		1.5E-09
SR-90	1.16E+00	2.5E+01	3.6E-11	9.1E-10		9.1E-10
TC-99	1.67E+04	3.6E+05	1.3E-12	4.7E-07		4.7E-07
U-234	1.40E+02	3.1E+03	1.6E-11	4.9E-08		4.9E-08
U-235/236	1.23E+01	2.7E+02	1.6E-11	4.3E-09		4.3E-09
U-238	1.51E+02	3.3E+03	2.8E-11	9.2E-08		9.2E-08
			Total Pathway:	7.2E-07	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	6.8E-04	1.4E-08	1.8E+00	2.4E-08	Arsenic	2.0E-06	1.8E+00	3.7E-06	3.7E-06
Benzo(a)anthracene	1.4E-04	2.8E-09	7.3E-01	2.1E-09	Benzo(a)anthracene	3.4E-04		2.1E-09	4.1E-09
Benzo(a)pyrene	1.0E-04	2.0E-09	7.3E+00	1.5E-08	Benzo(a)pyrene	3.6E-04		1.5E-08	3.0E-08
Benzo(b)fluoranthene	1.7E-05	3.4E-10	7.3E-01	2.5E-10	Benzo(b)fluoranthene	6.0E-05		2.5E-10	5.0E-10
Benzo(g,h,i)perylene	4.9E-04	9.7E-09			Benzo(g,h,i)perylene	7.6E-03			
Beryllium	7.1E-05	1.4E-09	4.3E+00	6.1E-09	Beryllium	2.1E-07		6.1E-09	1.2E-08
Dibenzo(a,h)anthrace	2.1E-05	4.2E-10	7.3E+00	3.0E-09	Dibenzo(a,h)anthrace	1.7E-04		3.0E-09	6.1E-09
Dieldrin	3.1E-05	6.2E-10	1.6E+01	1.0E-08	Dieldrin	1.5E-06	1.6E+01	2.3E-05	2.3E-05
Lead	1.2E-02	2.4E-07			Lead	1.4E-07			
Phenanthrene	1.5E-01	3.0E-06			Phenanthrene	1.0E-01			
U-Total	4.6E-01	9.2E-06			U-Total	1.4E-03			
			Total Pathway:	6.0E-08			Total Pathway:	2.7E-05	
			Total Rad + Chem	7.8E-07			Total Rad + Chem	2.7E-05	***Total:*** 2.8E-05

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TABLE B.3.2-5
(continued)

Non-carcinogenic Hazard

Radiation Hazard						
Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	0.8	1.7E+01				
PU-238	0.0	4.8E-01			Not applicable	
RA-226	5.5	1.2E+02				
RA-228	0.7	1.5E+01				
SR-90	1.2	2.5E+01				
TC-99	16700.0	3.6E+05				
U-234	140.0	3.1E+03				
U-235/236	12.3	2.7E+02				
U-238	151.0	3.3E+03				
Total Pathway:					Total Pathway:	

Chemical Hazard									
Ingestion/Surface Water					Dermal Contact/Surface Water				Total
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	6.8E-04	7.9E-08	3.0E-04	2.6E-04	Arsenic	1.2E-05	2.9E-04	4.1E-02	4.1E-02
Benzo(a)anthracene	1.4E-04	1.6E-08			Benzo(a)anthracene	2.0E-03			
Benzo(a)pyrene	1.0E-04	1.2E-08			Benzo(a)pyrene	2.1E-03			
Benzo(b)fluoranthene	1.7E-05	2.0E-09			Benzo(b)fluoranthene	3.5E-04			
Benzo(g,h,i)perylene	4.9E-04	5.6E-08			Benzo(g,h,i)perylene	4.4E-02			
Beryllium	7.1E-05	8.2E-09	5.0E-03	1.6E-06	Beryllium	1.2E-06	5.0E-05	2.4E-02	2.4E-02
Dibenzo(a,h)anthrace	2.1E-05	2.4E-09			Dibenzo(a,h)anthrace	9.6E-04			
Dieldrin	3.1E-05	3.6E-09	5.0E-05	7.3E-05	Dieldrin	8.5E-06	5.0E-05	1.7E-01	1.7E-01
Lead	1.2E-02	1.4E-06			Lead	8.3E-07			
Phenanthrene	1.5E-01	1.8E-05			Phenanthrene	5.9E-01			
U-Total	4.6E-01	5.4E-05	3.0E-03	1.8E-02	U-Total	7.9E-03	1.5E-04	5.3E+01	5.3E+01
			Total Pathway:	1.8E-02			Total Pathway:	5.3E+01	
			Total Rad + Chem	1.8E-02			Total Rad + Chem	5.3E+01	*Total:* 5.3E+01

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TABLE B.3.2-6

CURRENT, TRESPASSING YOUTH

SOUTH FIELD: SEDIMENT

Carcinogenic Risk

Radiation Risk

Ingestion/Sediment					Dermal Contact/Sediment	External Radiation/Sediment			Total
Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk		Compound	Intake	SF(e)	Risk	
NP-237	2.10E-01	7.9E-01	2.2E-10	1.7E-10		NP-237	1.5E-02	4.3E-07	6.4E-09	6.6E-09
PU-238	1.16E-01	4.3E-01	2.2E-10	9.6E-11	Not applicable	PU-238	8.3E-03	2.8E-11	2.3E-13	9.6E-11
RA-226	3.08E+01	1.2E+02	7.8E-10	9.0E-08		RA-226	2.2E+00	6.0E-06	1.3E-05	1.3E-05
RA-228	3.89E+00	1.5E+01	1.0E-10	1.5E-09		RA-228	2.8E-01	2.9E-06	8.0E-07	8.1E-07
SR-90	1.55E-01	5.8E-01	3.6E-11	2.1E-11		SR-90	1.1E-02			2.1E-11
TC-99	6.19E+01	2.3E+02	1.3E-12	3.0E-10		TC-99	4.4E+00	6.0E-13	2.6E-12	3.0E-10
U-234	8.15E+00	3.1E+01	1.6E-11	4.9E-10		U-234	5.8E-01	3.0E-11	1.7E-11	5.1E-10
U-235/236	8.38E-01	3.1E+00	1.6E-11	5.0E-11		U-235/236	6.0E-02	2.4E-07	1.4E-08	1.4E-08
U-238	8.77E+00	3.3E+01	2.8E-11	9.2E-10		U-238	6.2E-01	3.6E-08	2.2E-08	2.3E-08
		Total Pathway:		9.3E-08	Total Pathway:		Total Pathway:		1.4E-05	

Chemical Risk

Ingestion/Sediment					Dermal Contact/Sediment				External Radiation/Sediment				
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Benzo(a)pyrene	9.40E+00	3.2E-08	7.3E+00	2.3E-07	Benzo(a)pyrene			2.3E-07					4.7E-07
Benzo(b)fluoranthene	6.20E+00	2.1E-08	7.3E-01	1.5E-08	Benzo(b)fluoranthene			1.5E-08					3.1E-08
Benzo(g,h,i)perylene	6.20E+00	2.1E-08			Benzo(g,h,i)perylene	5.4E-06							
Arsenic	7.27E+00	2.5E-08	1.8E+00	4.3E-08	Arsenic	2.1E-08	1.8E+00	3.9E-08		Not applicable			8.2E-08
Beryllium	9.42E-01	3.2E-09	4.3E+00	1.4E-08	Beryllium	2.7E-08		1.4E-08					2.8E-08
Lead	2.45E+01	8.3E-08			Lead	7.1E-07							
U-TOTAL	2.79E+01	9.5E-08			U-TOTAL	8.1E-07							
Benzo(a)anthracene	5.50E+00	1.9E-08	7.3E-01	1.4E-08	Benzo(a)anthracene								1.4E-08
Dieldrin	9.55E-03	3.3E-11	1.6E+01	5.2E-10	Dieldrin	1.7E-09							5.2E-10
Dibenzo(a,h)anthracene	1.90E+00	6.5E-09	7.3E+00	4.7E-08	Dibenzo(a,h)anthracene								4.7E-08
Phenanthrene	2.30E+00	7.8E-09			Phenanthrene								
		Total Pathway:		3.7E-07			Total Pathway:	3.0E-07		Total Pathway:			

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	4.6E-07	Total Rad + Chem	3.0E-07	Total Rad + Chem	1.4E-05	*Total:*	1.5E-05

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TABLE B.3.2-6
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment					Dermal Contact/Sediment	**Total**
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard		
NP-237	2.10E-01	7.9E-01			Not applicable	
PU-238	1.16E-01	4.3E-01				
RA-226	3.08E+01	1.2E+02				
RA-228	3.89E+00	1.5E+01				
SR-90	1.55E-01	5.8E-01				
TC-99	6.19E+01	2.3E+02				
U-234	8.15E+00	3.1E+01				
U-235/236	8.38E-01	3.1E+00				
U-238	8.77E+00	3.3E+01				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Sediment					Dermal Contact/Sediment				
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Benzo(a)pyrene	9.40E+00	1.9E-07			Benzo(a)pyrene				
Benzo(b)fluoranthene	6.20E+00	1.2E-07			Benzo(b)fluoranthene				
Benzo(g,h,i)perylene	6.20E+00	1.2E-07			Benzo(g,h,i)perylene	3.2E-05			
Arsenic	7.27E+00	1.4E-07	3.0E-04	4.8E-04	Arsenic	1.2E-07	2.9E-04	4.3E-04	9.2E-04
Beryllium	9.42E-01	1.9E-08	5.0E-03	3.7E-06	Beryllium	1.6E-07	5.0E-05	3.2E-03	3.2E-03
Lead	2.45E+01	4.9E-07			Lead	4.2E-06			
U-TOTAL	2.79E+01	5.5E-07	3.0E-03	1.8E-04	U-TOTAL	4.7E-06	1.5E-04	3.7E-04	5.5E-04
Benzo(a)anthracene	5.50E+00	1.1E-07			Benzo(a)anthracene				
Dieldrin	9.55E-03	1.9E-10	5.0E-05	3.8E-06	Dieldrin	9.7E-09	5.0E-05	1.9E-04	2.0E-04
Dibenzo(a,h)anthracene	1.90E+00	3.8E-08			Dibenzo(a,h)anthracene				
Phenanthrene	2.30E+00	4.6E-08			Phenanthrene	1.2E-05			
			Total Pathway:	6.7E-04			Total Pathway:	4.2E-03	
			Total Rad + Chem	6.7E-04			Total Rad + Chem	4.2E-03	*Total:* 4.9E-03

TABLE B.3.2-7(a)
CURRENT, OFF-PROPERTY RESIDENT FARMER
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	3.65E-07	4.2E-02	1.9E-11	8.0E-13	8.0E-13
NP-237	1.57E-07	1.8E-02	2.9E-08	5.3E-10	5.3E-10
PU-238	8.49E-08	9.8E-03	3.9E-08	3.8E-10	3.8E-10
PU-239/240	5.56E-08	6.4E-03	3.8E-08	2.4E-10	2.4E-10
RA-226	2.25E-05	2.6E+00	7.0E-09	1.8E-08	1.8E-08
RA-228	2.84E-06	3.3E-01	6.9E-10	2.3E-10	2.3E-10
SR-90	1.17E-06	1.4E-01	6.2E-11	8.4E-12	8.4E-12
TC-99	1.04E-04	1.2E+01	8.3E-12	1.0E-10	1.0E-10
TH-228	3.23E-06	3.7E-01	7.8E-08	2.9E-08	2.9E-08
TH-230	1.01E-05	1.2E+00	2.9E-08	3.4E-08	3.4E-08
TH-232	2.92E-06	3.4E-01	1.1E-07	3.7E-08	3.7E-08
U-234	6.33E-06	7.3E-01	2.6E-08	1.9E-08	1.9E-08
U-235/236	6.49E-07	7.5E-02	2.5E-08	1.9E-09	1.9E-09
U-238	6.81E-06	7.9E-01	5.2E-08	4.1E-08	4.1E-08
			Total Pathway:	1.8E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	6.51E-11	4.2E-12			
Aroclor-1260	3.80E-11	2.5E-12			
Arsenic	5.32E-09	3.4E-10	1.5E+01	5.2E-09	5.2E-09
Benzo(a)anthracene	4.02E-09	2.6E-10	6.1E-01	1.6E-10	1.6E-10
Benzo(a)pyrene	6.88E-09	4.5E-10	6.1E+00	2.7E-09	2.7E-09
Benzo(b)fluoranthene	4.54E-09	2.9E-10	6.1E-01	1.8E-10	1.8E-10
Benzo(g,h,i)perylene	4.54E-09	2.9E-10			
Benzo(k)fluoranthene	5.34E-09	3.5E-10	6.1E-02	2.1E-11	2.1E-11
Beryllium	6.89E-10	4.5E-11	8.4E+00	3.8E-10	3.8E-10
Lead	1.80E-08	1.2E-09			
Dibenzo(a,h)anthracene	1.39E-09	9.0E-11	6.1E+00	5.5E-10	5.5E-10
Dieldrin	7.32E-12	4.7E-13	1.6E+01	7.6E-12	7.6E-12
Indeno(1,2,3-cd)pyrene	4.39E-09	2.8E-10	6.1E-01	1.7E-10	1.7E-10
Phenanthrene	1.68E-09	1.1E-10			
TH-Total	2.69E-08	1.7E-09			
			Total Pathway:	9.4E-09	

Total Rad + Chem 1.9E-07 *Total:* 1.9E-07

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TABLE B.3.2-7(a)
(continued)

Noncarcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	3.65E-07	4.2E-02		
NP-237	1.57E-07	1.8E-02		
PU-238	8.49E-08	9.8E-03		
PU-239/240	5.56E-08	6.4E-03		
RA-226	2.25E-05	2.6E+00		
RA-228	2.84E-06	3.3E-01		
SR-90	1.17E-06	1.4E-01		
TC-99	1.04E-04	1.2E+01		
TH-228	3.23E-06	3.7E-01		
TH-230	1.01E-05	1.2E+00		
TH-232	2.92E-06	3.4E-01		
U-234	6.33E-06	7.3E-01		
U-235/236	6.49E-07	7.5E-02		
U-238	6.81E-06	7.9E-01		
		Total Pathway:		

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	6.51E-11	4.2E-12		
Aroclor-1260	3.80E-11	2.5E-12		
Arsenic	5.32E-09	3.4E-10		
Benzo(a)anthracene	4.02E-09	2.6E-10		
Benzo(a)pyrene	6.88E-09	4.5E-10		
Benzo(b)fluoranthene	4.54E-09	2.9E-10		
Benzo(g,h,i)perylene	4.54E-09	2.9E-10		
Benzo(k)fluoranthene	5.34E-09	3.5E-10		
Beryllium	6.89E-10	4.5E-11		
Lead	1.80E-08	1.2E-09		
Dibenzo(a,h)anthracene	1.39E-09	9.0E-11		
Dieldrin	7.32E-12	4.7E-13		
Indeno(1,2,3-cd)pyrene	4.39E-09	2.8E-10		
Phenanthrene	1.68E-09	1.1E-10		
TH-Total	2.69E-08	1.7E-09		
		Total Pathway:		

Total

Total Rad + Chem

Total:

TABLE B.3.2-7(b)
CURRENT, OFF-PROPERTY RESIDENT CHILD
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	3.65E-07	7.7E-04	1.9E-11	1.5E-14	1.5E-14
NP-237	1.57E-07	3.3E-04	2.9E-08	9.6E-12	9.6E-12
PU-238	8.49E-08	1.8E-04	3.9E-08	7.0E-12	7.0E-12
PU-239/240	5.56E-08	1.2E-04	3.8E-08	4.4E-12	4.4E-12
RA-226	2.25E-05	4.7E-02	7.0E-09	3.3E-10	3.3E-10
RA-228	2.84E-06	6.0E-03	6.9E-10	4.1E-12	4.1E-12
SR-90	1.17E-06	2.5E-03	6.2E-11	1.5E-13	1.5E-13
TC-99	1.04E-04	2.2E-01	8.3E-12	1.8E-12	1.8E-12
TH-228	3.23E-06	6.8E-03	7.8E-08	5.3E-10	5.3E-10
TH-230	1.01E-05	2.1E-02	2.9E-08	6.2E-10	6.2E-10
TH-232	2.92E-06	6.1E-03	1.1E-07	6.7E-10	6.7E-10
U-234	6.33E-06	1.3E-02	2.6E-08	3.5E-10	3.5E-10
U-235/236	6.49E-07	1.4E-03	2.5E-08	3.4E-11	3.4E-11
U-238	6.81E-06	1.4E-02	5.2E-08	7.4E-10	7.4E-10
			Total Pathway:	3.3E-09	

Chemical Risk

Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	6.51E-11	3.6E-13			
Aroclor-1260	3.80E-11	2.1E-13			
Arsenic	5.32E-09	2.9E-11	1.5E+01	4.4E-10	4.4E-10
Benzo(a)anthracene	4.02E-09	2.2E-11	6.1E-01	1.3E-11	1.3E-11
Benzo(a)pyrene	6.88E-09	3.8E-11	6.1E+00	2.3E-10	2.3E-10
Benzo(b)fluoranthene	4.54E-09	2.5E-11	6.1E-01	1.5E-11	1.5E-11
Benzo(g,h,i)perylene	4.54E-09	2.5E-11			
Benzo(k)fluoranthene	5.34E-09	2.9E-11	6.1E-02	1.8E-12	1.8E-12
Beryllium	6.89E-10	3.8E-12	8.4E+00	3.2E-11	3.2E-11
Lead	1.80E-08	9.9E-11			
Dibenzo(a,h)anthracene	1.39E-09	7.6E-12	6.1E+00	4.6E-11	4.6E-11
Dieldrin	7.32E-12	4.0E-14	1.6E+01	6.4E-13	6.4E-13
Indeno(1,2,3-cd)pyrene	4.39E-09	2.4E-11	6.1E-01	1.5E-11	1.5E-11
Phenanthrene	1.68E-09	9.2E-12			
TH-Total	2.69E-08	1.5E-10			
			Total Pathway:	7.9E-10	

Total Rad + Chem 4.1E-09 *Total:* 4.1E-09

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TABLE B.3.2-7(b)
(continued)

Noncarcinogenic Hazard

Radiation Hazard					Total
Inhalation of Particulates/Soil					
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	3.65E-07	7.7E-04			
NP-237	1.57E-07	3.3E-04			
PU-238	8.49E-08	1.8E-04			
PU-239/240	5.56E-08	1.2E-04			
RA-226	2.25E-05	4.7E-02			
RA-228	2.84E-06	6.0E-03			
SR-90	1.17E-06	2.5E-03			
TC-99	1.04E-04	2.2E-01			
TH-228	3.23E-06	6.8E-03			
TH-230	1.01E-05	2.1E-02			
TH-232	2.92E-06	6.1E-03			
U-234	6.33E-06	1.3E-02			
U-235/236	6.49E-07	1.4E-03			
U-238	6.81E-06	1.4E-02			
			Total Pathway:		

Chemical Hazard					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard	
Aroclor-1254	6.51E-11	4.2E-12			
Aroclor-1260	3.80E-11	2.4E-12			
Arsenic	5.32E-09	3.4E-10			
Benzo(a)anthracene	4.02E-09	2.6E-10			
Benzo(a)pyrene	6.88E-09	4.4E-10			
Benzo(b)fluoranthene	4.54E-09	2.9E-10			
Benzo(g,h,i)perylene	4.54E-09	2.9E-10			
Benzo(k)fluoranthene	5.34E-09	3.4E-10			
Beryllium	6.89E-10	4.4E-11			
Lead	1.80E-08	1.2E-09			
Dibenzo(a,h)anthracene	1.39E-09	8.9E-11			
Dieldrin	7.32E-12	4.7E-13			
Indeno(1,2,3-cd)pyrene	4.39E-09	2.8E-10			
Phenanthrene	1.68E-09	1.1E-10			
TH-Total	2.69E-08	1.7E-09			
			Total Pathway:		

Total Rad + Chem | *Total:*

TABLE B.3.2-8(a)
CURRENT OFF-PROPERTY FARMER
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	3.60E-04	6.6E-01	2.8E-11	1.9E-11	CS-137	1.26E-04	9.3E-01	2.8E-11	2.6E-11	4.4E-11
NP-237	2.80E-07	5.1E-04	2.2E-10	1.1E-13	NP-237	2.55E-08	1.9E-04	2.2E-10	4.1E-14	1.5E-13
PU-238	1.66E-09	3.1E-06	2.2E-10	6.7E-16	PU-238	3.33E-10	2.4E-06	2.2E-10	5.4E-16	1.2E-15
PU-239/240	1.19E-09	2.2E-06	2.3E-10	5.0E-16	PU-239/240	2.37E-10	1.7E-06	2.3E-10	4.0E-16	9.0E-16
RA-226	2.46E-04	4.5E-01	7.8E-10	3.5E-10	RA-226	4.43E-04	3.3E+00	7.8E-10	2.5E-09	2.9E-09
RA-228	2.31E-05	4.2E-02	1.0E-10	4.2E-12	RA-228	4.18E-05	3.1E-01	1.0E-10	3.1E-11	3.5E-11
SR-90	1.22E-05	2.2E-02	3.6E-11	8.1E-13	SR-90	6.11E-05	4.5E-01	3.6E-11	1.6E-11	1.7E-11
TC-99	2.91E-02	5.4E+01	1.3E-12	7.0E-11	TC-99	3.43E-02	2.5E+02	1.3E-12	3.3E-10	4.0E-10
TH-228	5.90E-07	1.1E-03	5.5E-11	6.0E-14	TH-228	5.02E-07	3.7E-03	5.5E-11	2.0E-13	2.6E-13
TH-230	1.08E-05	2.0E-02	1.3E-11	2.6E-13	TH-230	8.99E-06	6.6E-02	1.3E-11	8.6E-13	1.1E-12
TH-232	3.13E-06	5.8E-03	1.7E-10	9.8E-13	TH-232	2.61E-06	1.9E-02	1.7E-10	3.3E-12	4.2E-12
U-234	4.03E-05	7.4E-02	1.6E-11	1.2E-12	U-234	1.21E-04	8.9E-01	1.6E-11	1.4E-11	1.5E-11
U-235/236	4.13E-06	7.6E-03	1.6E-11	1.2E-13	U-235/236	1.24E-05	9.1E-02	1.6E-11	1.5E-12	1.6E-12
U-238	4.34E-05	8.0E-02	2.8E-11	2.2E-12	U-238	1.30E-04	9.6E-01	2.8E-11	2.7E-11	2.9E-11
			Total Pathway:	4.5E-10				Total Pathway:	3.0E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	3.95E-07	4.1E-10	7.7E+00	3.1E-09	Aroclor-1254	1.25E-07	5.1E-10	7.7E+00	4.0E-09	7.1E-09
Aroclor-1260	2.44E-06	2.5E-09	7.7E+00	1.9E-08	Aroclor-1260	7.71E-07	3.2E-09	7.7E+00	2.4E-08	4.4E-08
Arsenic	6.32E-07	6.5E-10	1.8E+00	1.1E-09	Arsenic	1.90E-08	7.8E-11	1.8E+00	1.4E-10	1.3E-09
Benzo(a)anthracene	1.62E-06	1.7E-09	7.3E-01	1.2E-09	Benzo(a)anthracene	5.15E-07	2.1E-09	7.3E-01	1.5E-09	2.8E-09
Benzo(a)pyrene	7.48E-06	7.7E-09	7.3E+00	5.6E-08	Benzo(a)pyrene	2.38E-06	9.8E-09	7.3E+00	7.1E-08	1.3E-07
Benzo(b)fluoranthene	5.08E-06	5.2E-09	7.3E-01	3.8E-09	Benzo(b)fluoranthene	1.61E-06	6.6E-09	7.3E-01	4.8E-09	8.6E-09
Benzo(g,h,i)perylene	6.46E-05	6.6E-08			Benzo(g,h,i)perylene	2.05E-05	8.4E-08			
Benzo(k)fluoranthene	3.64E-05	3.7E-08	7.3E-02	2.7E-09	Benzo(k)fluoranthene	1.15E-05	4.7E-08	7.3E-02	3.5E-09	6.2E-09
Beryllium	4.20E-08	4.3E-11	4.3E+00	1.9E-10	Beryllium	3.78E-11	1.6E-13	4.3E+00	6.7E-13	1.9E-10
Lead	2.00E-07	2.0E-10			Lead	1.66E-07	6.8E-10			
Dibenzo(a,h)anthracene	8.37E-06	8.6E-09	7.3E+00	6.3E-08	Dibenzo(a,h)anthracene	2.66E-06	1.1E-08	7.3E+00	8.0E-08	1.4E-07
Dieldrin	2.47E-12	2.5E-15	1.6E+01	4.1E-14	Dieldrin	7.80E-13	3.2E-15	1.6E+01	5.1E-14	9.2E-14
Indeno(1,2,3-cd)pyrene	1.42E-05	1.5E-08	7.3E-01	1.1E-08	Indeno(1,2,3-cd)pyrene	4.52E-06	1.9E-08	7.3E-01	1.4E-08	2.4E-08
Phenanthrene	5.02E-08	5.2E-11			Phenanthrene	1.61E-08	6.6E-11			
TH-Total	2.88E-08	3.0E-11			TH-Total	2.40E-08	9.9E-11			
			Total Pathway:	1.6E-07				Total Pathway:	2.0E-07	
			Total Rad + Chem	1.6E-07				Total Rad + Chem	2.1E-07	*Total:* 3.7E-07

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TABLE B.3.2-8(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	3.6E-04	6.6E-01			CS-137	1.26E-04	9.3E-01			
NP-237	2.8E-07	5.1E-04			NP-237	2.55E-08	1.9E-04			
PU-238	1.7E-09	3.1E-06			PU-238	3.33E-10	2.4E-06			
PU-239/240	1.2E-09	2.2E-06			PU-239/240	2.37E-10	1.7E-06			
RA-226	2.5E-04	4.5E-01			RA-226	4.43E-04	3.3E+00			
RA-228	2.3E-05	4.2E-02			RA-228	4.18E-05	3.1E-01			
SR-90	1.2E-05	2.2E-02			SR-90	6.11E-05	4.5E-01			
TC-99	2.9E-02	5.4E+01			TC-99	3.43E-02	2.5E+02			
TH-228	5.9E-07	1.1E-03			TH-228	5.02E-07	3.7E-03			
TH-230	1.1E-05	2.0E-02			TH-230	8.99E-06	6.6E-02			
TH-232	3.1E-06	5.8E-03			TH-232	2.61E-06	1.9E-02			
U-234	4.0E-05	7.4E-02			U-234	1.21E-04	8.9E-01			
U-235/236	4.1E-06	7.6E-03			U-235/236	1.24E-05	9.1E-02			
U-238	4.3E-05	8.0E-02			U-238	1.30E-04	9.6E-01			

Total Pathway:

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.0E-07	4.1E-10			Aroclor-1254	1.2E-07	5.1E-10			
Aroclor-1260	2.4E-06	2.5E-09			Aroclor-1260	7.7E-07	3.2E-09			
Arsenic	6.3E-07	6.5E-10	3.0E-04	2.2E-06	Arsenic	1.9E-08	7.8E-11	3.0E-04	2.6E-07	2.4E-06
Benzo(a)anthracene	1.6E-06	1.7E-09			Benzo(a)anthracene	5.2E-07	2.1E-09			
Benzo(a)pyrene	7.5E-06	7.7E-09			Benzo(a)pyrene	2.4E-06	9.8E-09			
Benzo(b)fluoranthene	5.1E-06	5.2E-09			Benzo(b)fluoranthene	1.6E-06	6.6E-09			
Benzo(g,h,i)perylene	6.5E-05	6.6E-08			Benzo(g,h,i)perylene	2.1E-05	8.4E-08			
Benzo(k)fluoranthene	3.6E-05	3.7E-08			Benzo(k)fluoranthene	1.2E-05	4.7E-08			
Beryllium	4.2E-08	4.3E-11	5.0E-03	8.6E-09	Beryllium	3.8E-11	1.6E-13	5.0E-03	3.1E-11	8.7E-09
Lead	2.0E-07	2.0E-10			Lead	1.7E-07	6.8E-10			
Dibenzo(a,h)anthracene	8.4E-06	8.6E-09			Dibenzo(a,h)anthracene	2.7E-06	1.1E-08			
Dieldrin	2.5E-12	2.5E-15	5.0E-05	5.1E-11	Dieldrin	7.8E-13	3.2E-15	5.0E-05	6.4E-11	1.1E-10
Indeno(1,2,3-cd)pyrene	1.4E-05	1.5E-08			Indeno(1,2,3-cd)pyrene	4.5E-06	1.9E-08			
Phenanthrene	5.0E-08	5.2E-11			Phenanthrene	1.6E-08	6.6E-11			
TH-Total	2.9E-08	3.0E-11			TH-Total	2.4E-08	9.9E-11			

Total Pathway: 2.2E-06

Total Pathway: 2.6E-07

Total Rad + Chem 2.2E-06

Total Rad + Chem 2.6E-07 *Total:* 2.4E-06

TABLE B.3.2-8(b)
CURRENT OFF-PROPERTY CHILD
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	3.60E-04	2.2E-02	2.8E-11	6.1E-13	CS-137	1.26E-04	1.8E-01	2.8E-11	5.0E-12	5.7E-12
NP-237	2.80E-07	1.7E-05	2.2E-10	3.8E-15	NP-237	2.55E-08	3.6E-05	2.2E-10	8.0E-15	1.2E-14
PU-238	1.66E-09	1.0E-07	2.2E-10	2.2E-17	PU-238	3.33E-10	4.8E-07	2.2E-10	1.0E-16	1.3E-16
PU-239/240	1.19E-09	7.2E-08	2.3E-10	1.7E-17	PU-239/240	2.37E-10	3.4E-07	2.3E-10	7.8E-17	9.5E-17
RA-226	2.46E-04	1.5E-02	7.8E-10	1.2E-11	RA-226	4.43E-04	6.3E-01	7.8E-10	4.9E-10	5.1E-10
RA-228	2.31E-05	1.4E-03	1.0E-10	1.4E-13	RA-228	4.18E-05	6.0E-02	1.0E-10	6.0E-12	6.1E-12
SR-90	1.22E-05	7.4E-04	3.6E-11	2.7E-14	SR-90	6.11E-05	8.7E-02	3.6E-11	3.1E-12	3.2E-12
TC-99	2.91E-02	1.8E+00	1.3E-12	2.3E-12	TC-99	3.43E-02	4.9E+01	1.3E-12	6.4E-11	6.6E-11
TH-228	5.90E-07	3.6E-05	5.5E-11	2.0E-15	TH-228	5.02E-07	7.2E-04	5.5E-11	3.9E-14	4.1E-14
TH-230	1.08E-05	6.6E-04	1.3E-11	8.5E-15	TH-230	8.99E-06	1.3E-02	1.3E-11	1.7E-13	1.8E-13
TH-232	3.13E-06	1.9E-04	1.7E-10	3.2E-14	TH-232	2.61E-06	3.7E-03	1.7E-10	6.3E-13	6.7E-13
U-234	4.03E-05	2.5E-03	1.6E-11	3.9E-14	U-234	1.21E-04	1.7E-01	1.6E-11	2.8E-12	2.8E-12
U-235/236	4.13E-06	2.5E-04	1.6E-11	4.0E-15	U-235/236	1.24E-05	1.8E-02	1.6E-11	2.8E-13	2.9E-13
U-238	4.34E-05	2.6E-03	2.8E-11	7.4E-14	U-238	1.30E-04	1.9E-01	2.8E-11	5.2E-12	5.3E-12
			Total Pathway:	1.5E-11				Total Pathway:	5.8E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	3.95E-07	6.3E-11	7.7E+00	4.8E-10	Aroclor-1254	1.25E-07	4.7E-10	7.7E+00	3.6E-09	4.1E-09
Aroclor-1260	2.44E-06	3.9E-10	7.7E+00	3.0E-09	Aroclor-1260	7.71E-07	2.9E-09	7.7E+00	2.2E-08	2.5E-08
Arsenic	6.32E-07	1.0E-10	1.8E+00	1.8E-10	Arsenic	1.90E-08	7.1E-11	1.8E+00	1.2E-10	3.0E-10
Benzo(a)anthracene	1.62E-06	2.6E-10	7.3E-01	1.9E-10	Benzo(a)anthracene	5.15E-07	1.9E-09	7.3E-01	1.4E-09	1.6E-09
Benzo(a)pyrene	7.48E-06	1.2E-09	7.3E+00	8.7E-09	Benzo(a)pyrene	2.38E-06	8.9E-09	7.3E+00	6.5E-08	7.3E-08
Benzo(b)fluoranthene	5.08E-06	8.1E-10	7.3E-01	5.9E-10	Benzo(b)fluoranthene	1.61E-06	6.0E-09	7.3E-01	4.4E-09	5.0E-09
Benzo(g,h,i)perylene	6.46E-05	1.0E-08			Benzo(g,h,i)perylene	2.05E-05	7.7E-08			
Benzo(k)fluoranthene	3.64E-05	5.8E-09	7.3E-02	4.2E-10	Benzo(k)fluoranthene	1.15E-05	4.3E-08	7.3E-02	3.1E-09	3.6E-09
Beryllium	4.20E-08	6.7E-12	4.3E+00	2.9E-11	Beryllium	3.78E-11	1.4E-13	4.3E+00	6.1E-13	2.9E-11
Lead	2.00E-07	3.2E-11			Lead	1.66E-07	6.2E-10			
Dibenzo(a,h)anthracene	8.37E-06	1.3E-09	7.3E+00	9.7E-09	Dibenzo(a,h)anthracene	2.66E-06	9.9E-09	7.3E+00	7.2E-08	8.2E-08
Dieldrin	2.47E-12	3.9E-16	1.6E+01	6.3E-15	Dieldrin	7.80E-13	2.9E-15	1.6E+01	4.7E-14	5.3E-14
Indeno(1,2,3-cd)pyrene	1.42E-05	2.3E-09	7.3E-01	1.6E-09	Indeno(1,2,3-cd)pyrene	4.52E-06	1.7E-08	7.3E-01	1.2E-08	1.4E-08
Phenanthrene	5.02E-08	8.0E-12			Phenanthrene	1.61E-08	6.0E-11			
TH-Total	2.88E-08	4.6E-12			TH-Total	2.40E-08	9.0E-11			
			Total Pathway:	2.5E-08				Total Pathway:	1.8E-07	
			Total Rad + Chem	2.5E-08				Total Rad + Chem	1.8E-07	*Total:* 2.1E-07

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TABLE B.3.2-8(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	3.6E-04	2.2E-02			CS-137	1.26E-04	1.8E-01			
NP-237	2.8E-07	1.7E-05			NP-237	2.55E-08	3.6E-05			
PU-238	1.7E-09	1.0E-07			PU-238	3.33E-10	4.8E-07			
PU-239/240	1.2E-09	7.2E-08			PU-239/240	2.37E-10	3.4E-07			
RA-226	2.5E-04	1.5E-02			RA-226	4.43E-04	6.3E-01			
RA-228	2.3E-05	1.4E-03			RA-228	4.18E-05	6.0E-02			
SR-90	1.2E-05	7.4E-04			SR-90	6.11E-05	8.7E-02			
TC-99	2.9E-02	1.8E+00			TC-99	3.43E-02	4.9E+01			
TH-228	5.9E-07	3.6E-05			TH-228	5.02E-07	7.2E-04			
TH-230	1.1E-05	6.6E-04			TH-230	8.99E-06	1.3E-02			
TH-232	3.1E-06	1.9E-04			TH-232	2.61E-06	3.7E-03			
U-234	4.0E-05	2.5E-03			U-234	1.21E-04	1.7E-01			
U-235/236	4.1E-06	2.5E-04			U-235/236	1.24E-05	1.8E-02			
U-238	4.3E-05	2.6E-03			U-238	1.30E-04	1.9E-01			

Total Pathway:

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.0E-07	7.3E-10			Aroclor-1254	1.2E-07	5.4E-09			
Aroclor-1260	2.4E-06	4.5E-09			Aroclor-1260	7.7E-07	3.4E-08			
Arsenic	6.3E-07	1.2E-09	3.0E-04	3.9E-06	Arsenic	1.9E-08	8.2E-10	3.0E-04	2.7E-06	6.7E-06
Benzo(a)anthracene	1.6E-06	3.0E-09			Benzo(a)anthracene	5.2E-07	2.2E-08			
Benzo(a)pyrene	7.5E-06	1.4E-08			Benzo(a)pyrene	2.4E-06	1.0E-07			
Benzo(b)fluoranthene	5.1E-06	9.4E-09			Benzo(b)fluoranthene	1.6E-06	7.0E-08			
Benzo(g,h,i)perylene	6.5E-05	1.2E-07			Benzo(g,h,i)perylene	2.1E-05	8.9E-07			
Benzo(k)fluoranthene	3.6E-05	6.7E-08			Benzo(k)fluoranthene	1.2E-05	5.0E-07			
Beryllium	4.2E-08	7.8E-11	5.0E-03	1.6E-08	Beryllium	3.8E-11	1.6E-12	5.0E-03	3.3E-10	1.6E-08
Lead	2.0E-07	3.7E-10			Lead	1.7E-07	7.2E-09			
Dibenzo(a,h)anthracene	8.4E-06	1.6E-08			Dibenzo(a,h)anthracene	2.7E-06	1.2E-07			
Dieldrin	2.5E-12	4.6E-15	5.0E-05	9.2E-11	Dieldrin	7.8E-13	3.4E-14	5.0E-05	6.8E-10	7.7E-10
Indeno(1,2,3-cd)pyrene	1.4E-05	2.6E-08			Indeno(1,2,3-cd)pyrene	4.5E-06	2.0E-07			
Phenanthrene	5.0E-08	9.3E-11			Phenanthrene	1.6E-08	7.0E-10			
TH-Total	2.9E-08	5.3E-11			TH-Total	2.4E-08	1.0E-09			

Total Pathway: 3.9E-06

Total Pathway: 2.7E-06

Total Rad + Chem 3.9E-06

Total Rad + Chem 2.7E-06 *Total:* 6.7E-06

TABLE B.3.2-9 (a)

CURRENT OFF-PROPERTY FARMER

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	2.52E-07	5.0E-01	2.8E-11	1.4E-11	CS-137	2.10E-07	2.2E-01	2.8E-11	6.1E-12	2.0E-11
NP-237	7.76E-08	1.5E-01	2.2E-10	3.4E-11	NP-237	7.71E-08	8.1E-02	2.2E-10	1.8E-11	5.1E-11
PU-238	4.16E-08	8.2E-02	2.2E-10	1.8E-11	PU-238	4.15E-08	4.3E-02	2.2E-10	9.5E-12	2.8E-11
PU-239/240	2.72E-08	5.4E-02	2.3E-10	1.2E-11	PU-239/240	2.72E-08	2.8E-02	2.3E-10	6.5E-12	1.9E-11
RA-226	1.13E-05	2.2E+01	7.8E-10		RA-226	1.11E-05	1.2E+01	7.8E-10	9.1E-09	9.1E-09
RA-228	1.39E-06	2.7E+00	1.0E-10	2.7E-10	RA-228	1.38E-06	1.4E+00	1.0E-10	1.4E-10	4.2E-10
SR-90	6.42E-07	1.3E+00	3.6E-11	4.6E-11	SR-90	6.01E-07	6.3E-01	3.6E-11	2.3E-11	6.8E-11
TC-99	5.36E-05	1.1E+02	1.3E-12	1.4E-10	TC-99	5.20E-05	5.4E+01	1.3E-12	7.1E-11	2.1E-10
TH-228	1.58E-06	3.1E+00	5.5E-11	1.7E-10	TH-228	1.53E-06	1.6E+00	5.5E-11	8.8E-11	2.6E-10
TH-230	5.05E-06	9.9E+00	1.3E-11	1.3E-10	TH-230	4.99E-06	5.2E+00	1.3E-11	6.8E-11	2.0E-10
TH-232	1.46E-06	2.9E+00	1.7E-10	4.9E-10	TH-232	1.44E-06	1.5E+00	1.7E-10	2.6E-10	7.4E-10
U-234	3.10E-06	6.1E+00	1.6E-11	9.8E-11	U-234	3.10E-06	3.2E+00	1.6E-11	5.2E-11	1.5E-10
U-235/236	3.18E-07	6.3E-01	1.6E-11	1.0E-11	U-235/236	3.18E-07	3.3E-01	1.6E-11	5.3E-12	1.5E-11
U-238	3.34E-06	6.6E+00	2.8E-11	1.8E-10	U-238	3.33E-06	3.5E+00	2.8E-11	9.7E-11	2.8E-10
			Total Pathway:	1.6E-09				Total Pathway:	9.9E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.21E-07	1.3E-10	7.7E+00	1.0E-09	Aroclor-1254	6.99E-08	4.1E-11	7.7E+00	3.1E-10	1.3E-09
Aroclor-1260	3.11E-08	3.4E-11	7.7E+00	2.6E-10	Aroclor-1260	2.40E-08	1.4E-11	7.7E+00	1.1E-10	3.7E-10
Arsenic	3.21E-06	3.5E-09	1.8E+00	6.2E-09	Arsenic	2.86E-06	1.7E-09	1.8E+00	2.9E-09	9.1E-09
Benzo(a)anthracene	2.12E-06	2.3E-09	7.3E-01	1.7E-09	Benzo(a)anthracene	2.02E-06	1.2E-09	7.3E-01	8.6E-10	2.6E-09
Benzo(a)pyrene	3.51E-06	3.9E-09	7.3E+00	2.8E-08	Benzo(a)pyrene	3.40E-06	2.0E-09	7.3E+00	1.5E-08	4.3E-08
Benzo(b)fluoranthene	2.30E-06	2.5E-09	7.3E-01	1.8E-09	Benzo(b)fluoranthene	2.24E-06	1.3E-09	7.3E-01	9.5E-10	2.8E-09
Benzo(g,h,i)perylene	2.24E-06	2.5E-09			Benzo(g,h,i)perylene	2.21E-06	1.3E-09			
Benzo(k)fluoranthene	2.74E-06	3.0E-09	7.3E-02	2.2E-10	Benzo(k)fluoranthene	2.66E-06	1.6E-09	7.3E-02	1.1E-10	3.3E-10
Beryllium	3.62E-07	4.0E-10	4.3E+00	1.7E-09	Beryllium	3.48E-07	2.0E-10	4.3E+00	8.7E-10	2.6E-09
Lead	9.20E-06	1.0E-08			Lead	8.98E-06	5.2E-09			
Dibenzo(a,h)anthrace	6.95E-07	7.6E-10	7.3E+00	5.6E-09	Dibenzo(a,h)anthrace	6.83E-07	4.0E-10	7.3E+00	2.9E-09	8.5E-09
Dieldrin	1.24E-08	1.4E-11	1.6E+01	2.2E-10	Dieldrin	7.38E-09	4.3E-12	1.6E+01	6.9E-11	2.9E-10
Indeno(1,2,3-cd)pyre	2.20E-06	2.4E-09	7.3E-01	1.8E-09	Indeno(1,2,3-cd)pyre	2.15E-06	1.3E-09	7.3E-01	9.2E-10	2.7E-09
Phenanthrene	8.73E-07	9.6E-10			Phenanthrene	8.23E-07	4.8E-10			
TH-Total	1.34E-05	1.5E-08			TH-Total	1.33E-05	7.8E-09			
			Total Pathway:	4.9E-08				Total Pathway:	2.5E-08	
			Total Rad + Chem	5.0E-08				Total Rad + Chem	3.4E-08	*Total:* 8.5E-08

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TABLE B.3.2-9 (a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	2.5E-07				CS-137	2.10E-07				
NP-237	7.8E-08				NP-237	7.71E-08				
PU-238	4.2E-08				PU-238	4.15E-08				
PU-239/240	2.7E-08				PU-239/240	2.72E-08				
					RA-226	1.11E-05				
RA-228	1.4E-06				RA-228	1.38E-06				
SR-90	6.4E-07				SR-90	6.01E-07				
TC-99	5.4E-05				TC-99	5.20E-05				
TH-228	1.6E-06				TH-228	1.53E-06				
TH-230	5.0E-06				TH-230	4.99E-06				
TH-232	1.5E-06				TH-232	1.44E-06				
U-234	3.1E-06				U-234	3.10E-06				
U-235/236	3.2E-07				U-235/236	3.18E-07				
U-238	3.3E-06				U-238	3.33E-06				
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.2E-07	1.3E-10			Aroclor-1254	6.99E-08	4.1E-11			
Aroclor-1260	3.1E-08	3.4E-11			Aroclor-1260	2.40E-08	1.4E-11			
Arsenic	3.2E-06	3.5E-09	3.0E-04	1.2E-05	Arsenic	2.86E-06	1.7E-09	3.0E-04	5.6E-06	1.7E-05
Benzo(a)anthracene	2.1E-06	2.3E-09			Benzo(a)anthracene	2.02E-06	1.2E-09			
Benzo(a)pyrene	3.5E-06	3.9E-09			Benzo(a)pyrene	3.40E-06	2.0E-09			
Benzo(b)fluoranthene	2.3E-06	2.5E-09			Benzo(b)fluoranthene	2.24E-06	1.3E-09			
Benzo(g,h,i)perylene	2.2E-06	2.5E-09			Benzo(g,h,i)perylene	2.21E-06	1.3E-09			
Benzo(k)fluoranthene	2.7E-06	3.0E-09			Benzo(k)fluoranthene	2.66E-06	1.6E-09			
Beryllium	3.6E-07	4.0E-10	5.0E-03	8.0E-08	Beryllium	3.48E-07	2.0E-10	5.0E-03	1.0E-12	8.0E-08
Lead	9.2E-06	1.0E-08			Lead	8.98E-06	5.2E-09			
Dibenzo(a,h)anthrace	6.9E-07	7.6E-10			Dibenzo(a,h)anthrace	6.83E-07	4.0E-10			
Dieldrin	1.2E-08	1.4E-11	5.0E-05	2.7E-07	Dieldrin	7.38E-09	4.3E-12	5.0E-05	2.2E-16	2.7E-07
Indeno(1,2,3-cd)pyre	2.2E-06	2.4E-09			Indeno(1,2,3-cd)pyre	2.15E-06	1.3E-09			
Phenanthrene	8.7E-07	9.6E-10			Phenanthrene	8.23E-07	4.8E-10			
TH-Total	1.3E-05	1.5E-08			TH-Total	1.33E-05	7.8E-09			
			Total Pathway:	1.2E-05				Total Pathway:	5.6E-06	
			Total Rad + Chem	1.2E-05				Total Rad + Chem	5.6E-06	*Total:* 1.8E-05

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TABLE B.3.2-9 (b)

CURRENT OFF-PROPERTY CHILD

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	2.52E-07	2.1E-02	2.8E-11	5.9E-13	CS-137	2.10E-07	2.7E-02	2.8E-11	7.5E-13	1.3E-12
NP-237	7.76E-08	6.5E-03	2.2E-10	1.4E-12	NP-237	7.71E-08	9.9E-03	2.2E-10	2.2E-12	3.6E-12
PU-238	4.16E-08	3.5E-03	2.2E-10	7.7E-13	PU-238	4.15E-08	5.3E-03	2.2E-10	1.2E-12	1.9E-12
PU-239/240	2.72E-08	2.3E-03	2.3E-10	5.3E-13	PU-239/240	2.72E-08	3.5E-03	2.3E-10	8.0E-13	1.3E-12
RA-226	1.13E-05	9.5E-01	7.8E-10		RA-226	1.11E-05	1.4E+00	7.8E-10	1.1E-09	1.1E-09
RA-228	1.39E-06	1.2E-01	1.0E-10	1.2E-11	RA-228	1.38E-06	1.8E-01	1.0E-10	1.8E-11	2.9E-11
SR-90	6.42E-07	5.4E-02	3.6E-11	1.9E-12	SR-90	6.01E-07	7.7E-02	3.6E-11	2.8E-12	4.7E-12
TC-99	5.36E-05	4.5E+00	1.3E-12	5.9E-12	TC-99	5.20E-05	6.7E+00	1.3E-12	8.7E-12	1.5E-11
TH-228	1.58E-06	1.3E-01	5.5E-11	7.3E-12	TH-228	1.53E-06	2.0E-01	5.5E-11	1.1E-11	1.8E-11
TH-230	5.05E-06	4.2E-01	1.3E-11	5.5E-12	TH-230	4.99E-06	6.4E-01	1.3E-11	8.3E-12	1.4E-11
TH-232	1.46E-06	1.2E-01	1.7E-10	2.1E-11	TH-232	1.44E-06	1.9E-01	1.7E-10	3.2E-11	5.2E-11
U-234	3.10E-06	2.6E-01	1.6E-11	4.2E-12	U-234	3.10E-06	4.0E-01	1.6E-11	6.4E-12	1.1E-11
U-235/236	3.18E-07	2.7E-02	1.6E-11	4.3E-13	U-235/236	3.18E-07	4.1E-02	1.6E-11	6.5E-13	1.1E-12
U-238	3.34E-06	2.8E-01	2.8E-11	7.8E-12	U-238	3.33E-06	4.3E-01	2.8E-11	1.2E-11	2.0E-11
			Total Pathway:	6.9E-11				Total Pathway:	1.2E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.21E-07	2.6E-11	7.7E+00	2.0E-10	Aroclor-1254	6.99E-08	2.3E-11	7.7E+00	1.8E-10	3.8E-10
Aroclor-1260	3.11E-08	6.8E-12	7.7E+00	5.3E-11	Aroclor-1260	2.40E-08	8.0E-12	7.7E+00	6.2E-11	1.1E-10
Arsenic	3.21E-06	7.0E-10	1.8E+00	1.2E-09	Arsenic	2.86E-06	9.6E-10	1.8E+00	1.7E-09	2.9E-09
Benzo(a)anthracene	2.12E-06	4.6E-10	7.3E-01	3.4E-10	Benzo(a)anthracene	2.02E-06	6.8E-10	7.3E-01	4.9E-10	8.3E-10
Benzo(a)pyrene	3.51E-06	7.7E-10	7.3E+00	5.6E-09	Benzo(a)pyrene	3.40E-06	1.1E-09	7.3E+00	8.3E-09	1.4E-08
Benzo(b)fluoranthene	2.30E-06	5.0E-10	7.3E-01	3.7E-10	Benzo(b)fluoranthene	2.24E-06	7.5E-10	7.3E-01	5.5E-10	9.2E-10
Benzo(g,h,i)perylene	2.24E-06	4.9E-10			Benzo(g,h,i)perylene	2.21E-06	7.4E-10			
Benzo(k)fluoranthene	2.74E-06	6.0E-10	7.3E-02	4.4E-11	Benzo(k)fluoranthene	2.66E-06	8.9E-10	7.3E-02	6.5E-11	1.1E-10
Beryllium	3.62E-07	7.9E-11	4.3E+00	3.4E-10	Beryllium	3.48E-07	1.2E-10	4.3E+00	5.0E-10	8.4E-10
Lead	9.20E-06	2.0E-09			Lead	8.98E-06	3.0E-09			
Dibenzo(a,h)anthrace	6.95E-07	1.5E-10	7.3E+00	1.1E-09	Dibenzo(a,h)anthrace	6.83E-07	2.3E-10	7.3E+00	1.7E-09	2.8E-09
Dieldrin	1.24E-08	2.7E-12	1.6E+01	4.4E-11	Dieldrin	7.38E-09	2.5E-12	1.6E+01	4.0E-11	8.3E-11
Indeno(1,2,3-cd)pyre	2.20E-06	4.8E-10	7.3E-01	3.5E-10	Indeno(1,2,3-cd)pyre	2.15E-06	7.2E-10	7.3E-01	5.3E-10	8.8E-10
Phenanthrene	8.73E-07	1.9E-10			Phenanthrene	8.23E-07	2.8E-10			
TH-Total	1.34E-05	2.9E-09			TH-Total	1.33E-05	4.5E-09			
			Total Pathway:	9.7E-09				Total Pathway:	1.4E-08	
			Total Rad + Chem	9.8E-09				Total Rad + Chem	1.5E-08	*Total:* 2.5E-08

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TABLE B.3.2-9 (b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	2.5E-07	2.1E-02			CS-137	2.10E-07	2.7E-02			
NP-237	7.8E-08	6.5E-03			NP-237	7.71E-08	9.9E-03			
PU-238	4.2E-08	3.5E-03			PU-238	4.15E-08	5.3E-03			
PU-239/240	2.7E-08	2.3E-03			PU-239/240	2.72E-08	3.5E-03			
		9.5E-01			RA-226	1.11E-05	1.4E+00			
RA-228	1.4E-06	1.2E-01			RA-228	1.38E-06	1.8E-01			
SR-90	6.4E-07	5.4E-02			SR-90	6.01E-07	7.7E-02			
TC-99	5.4E-05	4.5E+00			TC-99	5.20E-05	6.7E+00			
TH-228	1.6E-06	1.3E-01			TH-228	1.53E-06	2.0E-01			
TH-230	5.0E-06	4.2E-01			TH-230	4.99E-06	6.4E-01			
TH-232	1.5E-06	1.2E-01			TH-232	1.44E-06	1.9E-01			
U-234	3.1E-06	2.6E-01			U-234	3.10E-06	4.0E-01			
U-235/236	3.2E-07	2.7E-02			U-235/236	3.18E-07	4.1E-02			
U-238	3.3E-06	2.8E-01			U-238	3.33E-06	4.3E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.2E-07	3.1E-10			Aroclor-1254	6.99E-08	2.7E-10			
Aroclor-1260	3.1E-08	8.0E-11			Aroclor-1260	2.40E-08	9.4E-11			
Arsenic	3.2E-06	8.2E-09	3.0E-04	2.7E-05	Arsenic	2.86E-06	1.1E-08	3.0E-04	3.7E-05	6.5E-05
Benzo(a)anthracene	2.1E-06	5.4E-09			Benzo(a)anthracene	2.02E-06	7.9E-09			
Benzo(a)pyrene	3.5E-06	9.0E-09			Benzo(a)pyrene	3.40E-06	1.3E-08			
Benzo(b)fluoranthene	2.3E-06	5.9E-09			Benzo(b)fluoranthene	2.24E-06	8.7E-09			
Benzo(g,h,i)perylene	2.2E-06	5.7E-09			Benzo(g,h,i)perylene	2.21E-06	8.7E-09			
Benzo(k)fluoranthene	2.7E-06	7.0E-09			Benzo(k)fluoranthene	2.66E-06	1.0E-08			
Beryllium	3.6E-07	9.2E-10	5.0E-03	1.8E-07	Beryllium	3.48E-07	1.4E-09	5.0E-03	6.8E-12	1.8E-07
Lead	9.2E-06	2.4E-08			Lead	8.98E-06	3.5E-08			
Dibenzo(a,h)anthrace	6.9E-07	1.8E-09			Dibenzo(a,h)anthrace	6.83E-07	2.7E-09			
Dieldrin	1.2E-08	3.2E-11	5.0E-05	6.4E-07	Dieldrin	7.38E-09	2.9E-11	5.0E-05	1.4E-15	6.4E-07
Indeno(1,2,3-cd)pyre	2.2E-06	5.6E-09			Indeno(1,2,3-cd)pyre	2.15E-06	8.4E-09			
Phenanthrene	8.7E-07	2.2E-09			Phenanthrene	8.23E-07	3.2E-09			
TH-Total	1.3E-05	3.4E-08			TH-Total	1.33E-05	5.2E-08			
		Total Pathway:		2.8E-05			Total Pathway:		3.7E-05	
		Total Rad + Chem		2.8E-05			Total Rad + Chem		3.7E-05	*Total:* 6.5E-05

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TABLE B.3.2-10
CURRENT USER OF MILK AND MEAT
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	4.38E-03	8.0E+00	2.8E-11	2.3E-10	CS-137	1.53E-03	1.1E+01	2.8E-11	3.2E-10	5.4E-10
NP-237	3.41E-06	6.3E-03	2.2E-10	1.4E-12	NP-237	3.10E-07	2.3E-03	2.2E-10	5.0E-13	1.9E-12
PU-238	2.02E-08	3.7E-05	2.2E-10	8.2E-15	PU-238	4.04E-09	3.0E-05	2.2E-10	6.5E-15	1.5E-14
PU-239/240	1.45E-08	2.7E-05	2.3E-10	6.1E-15	PU-239/240	2.89E-09	2.1E-05	2.3E-10	4.9E-15	1.1E-14
RA-226	3.00E-03	5.5E+00	7.8E-10	4.3E-09	RA-226	5.40E-03	4.0E+01	7.8E-10	3.1E-08	3.5E-08
RA-228	2.80E-04	5.2E-01	1.0E-10	5.2E-11	RA-228	5.08E-04	3.7E+00	1.0E-10	3.7E-10	4.3E-10
SR-90	1.48E-05	2.7E-02	3.6E-11	9.8E-13	SR-90	7.41E-05	5.4E-01	3.6E-11	2.0E-11	2.1E-11
TC-99	3.53E-01	6.5E+02	1.3E-12	8.4E-10	TC-99	4.15E-01	3.1E+03	1.3E-12	4.0E-09	4.8E-09
TH-228	7.18E-06	1.3E-02	5.5E-11	7.3E-13	TH-228	6.10E-06	4.5E-02	5.5E-11	2.5E-12	3.2E-12
TH-230	1.31E-04	2.4E-01	1.3E-11	3.1E-12	TH-230	1.10E-04	8.0E-01	1.3E-11	1.0E-11	1.4E-11
TH-232	3.81E-05	7.0E-02	1.7E-10	1.2E-11	TH-232	3.17E-05	2.3E-01	1.7E-10	4.0E-11	5.2E-11
U-234	4.91E-04	9.0E-01	1.6E-11	1.4E-11	U-234	1.47E-03	1.1E+01	1.6E-11	1.7E-10	1.9E-10
U-235/236	5.03E-05	9.2E-02	1.6E-11	1.5E-12	U-235/236	1.51E-04	1.1E+00	1.6E-11	1.8E-11	1.9E-11
U-238	5.28E-04	9.7E-01	2.8E-11	2.7E-11	U-238	1.58E-03	1.2E+01	2.8E-11	3.3E-10	3.5E-10
			Total Pathway:	5.5E-09				Total Pathway:	3.6E-08	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	4.81E-06	4.9E-09	7.7E+00	3.8E-08	Aroclor-1254	1.52E-06	6.2E-09	7.7E+00	4.8E-08	8.6E-08
Aroclor-1260	2.97E-05	3.1E-08	7.7E+00	2.4E-07	Aroclor-1260	9.40E-06	3.9E-08	7.7E+00	3.0E-07	5.3E-07
Arsenic	7.69E-06	7.9E-09	1.8E+00	1.4E-08	Arsenic	2.31E-07	9.5E-10	1.8E+00	1.7E-09	1.5E-08
Benzo(a)anthracene	1.98E-05	2.0E-08	7.3E-01	1.5E-08	Benzo(a)anthracene	6.28E-06	2.6E-08	7.3E-01	1.9E-08	3.4E-08
Benzo(a)pyrene	9.10E-05	9.3E-08	7.3E+00	6.8E-07	Benzo(a)pyrene	2.89E-05	1.2E-07	7.3E+00	8.7E-07	1.5E-06
Benzo(b)fluoranthene	6.17E-05	6.3E-08	7.3E-01	4.6E-08	Benzo(b)fluoranthene	1.96E-05	8.1E-08	7.3E-01	5.9E-08	1.1E-07
Benzo(g,h,i)perylene	7.86E-04	8.1E-07			Benzo(g,h,i)perylene	2.50E-04	1.0E-06			
Benzo(k)fluoranthene	4.43E-04	4.5E-07	7.3E-02	3.3E-08	Benzo(k)fluoranthene	1.40E-04	5.8E-07	7.3E-02	4.2E-08	7.5E-08
Beryllium	5.12E-07	5.3E-10	4.3E+00	2.3E-09	Beryllium	4.61E-10	1.9E-12	4.3E+00	8.1E-12	2.3E-09
Lead	2.43E-06	2.5E-09			Lead	2.02E-06	8.3E-09			
Dibenzo(a,h)anthracene	1.02E-04	1.0E-07	7.3E+00	7.6E-07	Dibenzo(a,h)anthracene	3.23E-05	1.3E-07	7.3E+00	9.7E-07	1.7E-06
Dieldrin	2.91E-11	3.0E-14	1.6E+01	4.8E-13	Dieldrin	9.21E-12	3.8E-14	1.6E+01	6.1E-13	1.1E-12
Indeno(1,2,3-cd)pyrene	1.73E-04	1.8E-07	7.3E-01	1.3E-07	Indeno(1,2,3-cd)pyrene	5.50E-05	2.3E-07	7.3E-01	1.6E-07	2.9E-07
Phenanthrene	6.12E-07	6.3E-10			Phenanthrene	1.97E-07	8.1E-10			
TH-Total	3.51E-07	3.6E-10			TH-Total	2.92E-07	1.2E-09			
			Total Pathway:	2.0E-06				Total Pathway:	2.5E-06	
			Total Rad + Chem	2.0E-06				Total Rad + Chem	2.5E-06	*Total:* 4.5E-06

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TABLE B.3.2-10
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.4E-03	8.0E+00		
NP-237	3.4E-06	6.3E-03		
PU-238	2.0E-08	3.7E-05		
PU-239/240	1.4E-08	2.7E-05		
RA-226	3.0E-03	5.5E+00		
RA-228	2.8E-04	5.2E-01		
SR-90	1.5E-05	2.7E-02		
TC-99	3.5E-01	6.5E+02		
TH-228	7.2E-06	1.3E-02		
TH-230	1.3E-04	2.4E-01		
TH-232	3.8E-05	7.0E-02		
U-234	4.9E-04	9.0E-01		
U-235/236	5.0E-05	9.2E-02		
U-238	5.3E-04	9.7E-01		

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	1.53E-03	1.1E+01		
NP-237	3.10E-07	2.3E-03		
PU-238	4.04E-09	3.0E-05		
PU-239/240	2.89E-09	2.1E-05		
RA-226	5.40E-03	4.0E+01		
RA-228	5.08E-04	3.7E+00		
SR-90	7.41E-05	5.4E-01		
TC-99	4.15E-01	3.1E+03		
TH-228	6.10E-06	4.5E-02		
TH-230	1.10E-04	8.0E-01		
TH-232	3.17E-05	2.3E-01		
U-234	1.47E-03	1.1E+01		
U-235/236	1.51E-04	1.1E+00		
U-238	1.58E-03	1.2E+01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	4.8E-06	4.9E-09		
Aroclor-1260	3.0E-05	3.1E-08		
Arsenic	7.7E-06	7.9E-09	3.0E-04	2.6E-05
Benzo(a)anthracene	2.0E-05	2.0E-08		
Benzo(a)pyrene	9.1E-05	9.3E-08		
Benzo(b)fluoranthene	6.2E-05	6.3E-08		
Benzo(g,h,i)perylene	7.9E-04	8.1E-07		
Benzo(k)fluoranthene	4.4E-04	4.5E-07		
Beryllium	5.1E-07	5.3E-10	5.0E-03	1.1E-07
Lead	2.4E-06	2.5E-09		
Dibenzo(a,h)anthracene	1.0E-04	1.0E-07		
Dieldrin	2.9E-11	3.0E-14	5.0E-05	6.0E-10
Indeno(1,2,3-cd)pyrene	1.7E-04	1.8E-07		
Phenanthrene	6.1E-07	6.3E-10		
TH-Total	3.5E-07	3.6E-10		

Total Pathway: 2.6E-05

Total Rad + Chem 2.6E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254	1.5E-06	6.2E-09		
Aroclor-1260	9.4E-06	3.9E-08		
Arsenic	2.3E-07	9.5E-10	3.0E-04	3.2E-06
Benzo(a)anthracene	6.3E-06	2.6E-08		
Benzo(a)pyrene	2.9E-05	1.2E-07		
Benzo(b)fluoranthene	2.0E-05	8.1E-08		
Benzo(g,h,i)perylene	2.5E-04	1.0E-06		
Benzo(k)fluoranthene	1.4E-04	5.8E-07		
Beryllium	4.6E-10	1.9E-12	5.0E-03	3.8E-10
Lead	2.0E-06	8.3E-09		
Dibenzo(a,h)anthracene	3.2E-05	1.3E-07		
Dieldrin	9.2E-12	3.8E-14	5.0E-05	7.6E-10
Indeno(1,2,3-cd)pyrene	5.5E-05	2.3E-07		
Phenanthrene	2.0E-07	8.1E-10		
TH-Total	2.9E-07	1.2E-09		

Total Pathway: 3.2E-06

Total Rad + Chem 3.2E-06

Total	
	2.9E-05
	1.1E-07
	1.4E-09
Total:	3.0E-05

TABLE B.3.2-11
CURRENT, GROUNDSKEEPER
SOUTH FIELD: SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	4.9E-06	8.6E-02	1.9E-11	1.6E-12
NP-237	2.1E-06	3.7E-02	2.9E-08	1.1E-09
PU-238	1.2E-06	2.0E-02	3.9E-08	7.8E-10
PU-239/240	7.5E-07	1.3E-02	3.8E-08	5.0E-10
RA-226	3.1E-04	5.3E+00	7.0E-09	3.7E-08
RA-228	3.8E-05	6.7E-01	6.9E-10	4.6E-10
SR-90	1.6E-05	2.8E-01	6.2E-11	1.7E-11
TC-99	1.4E-03	2.5E+01	8.3E-12	2.0E-10
TH-228	4.4E-05	2.5E+01	7.8E-08	1.9E-06
TH-230	1.4E-04	7.6E-01	2.9E-08	2.2E-08
TH-232	4.0E-05	2.4E+00	1.1E-07	2.6E-07
U-234	8.6E-05	6.9E-01	2.6E-08	1.8E-08
U-235/236	8.8E-06	1.5E+00	2.5E-08	3.7E-08
U-238	9.2E-05	1.5E-01	5.2E-08	8.0E-09
			Total Pathway	2.3E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	5.0E-01	4.4E+01	2.8E-11	1.2E-09
NP-237	2.1E-01	1.9E+01	2.2E-10	4.1E-09
PU-238	1.2E-01	1.0E+01	2.2E-10	2.2E-09
PU-239/240	7.6E-02	6.7E+00	2.3E-10	1.5E-09
RA-226	3.1E+01	2.7E+03	7.8E-10	2.1E-06
RA-228	3.9E+00	3.4E+02	1.0E-10	3.4E-08
SR-90	1.6E+00	1.4E+02	3.6E-11	5.0E-09
TC-99	1.4E+02	1.2E+04	1.3E-12	1.6E-08
TH-228	4.4E+00	3.9E+02	5.5E-11	2.1E-08
TH-230	1.4E+01	1.2E+03	1.3E-11	1.6E-08
TH-232	4.0E+00	3.5E+02	1.7E-10	5.9E-08
U-234	8.7E+00	7.6E+02	1.6E-11	1.2E-08
U-235/236	8.9E-01	7.8E+01	1.6E-11	1.2E-09
U-238	9.3E+00	8.1E+02	2.8E-11	2.3E-08
			Total Pathway	2.3E-06

Chemical Risk

Inhalation/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	8.8E-10	8.6E-12		
Aroclor-1260	5.2E-10	5.0E-12		
Arsenic	7.2E-08	7.0E-10	1.5E+01	1.1E-08
Benzo(a)anthracene	5.5E-08	5.3E-10	6.1E-01	3.3E-10
Benzo(a)pyrene	9.3E-08	9.1E-10	6.1E+00	5.6E-09
Benzo(b)fluoranthene	6.1E-08	6.0E-10	6.1E-01	3.7E-10
Benzo(g,h,i)perylene	6.2E-08	6.0E-10		
Benzo(k)fluoranthene	7.2E-08	7.1E-10	6.1E-02	4.3E-11
Beryllium	9.3E-09	9.1E-11	8.4E+00	7.7E-10
Lead	2.4E-07	2.4E-09		
Dibenzo(a,h)anthracene	1.9E-08	1.8E-10	6.1E+00	1.1E-09
Dieldrin	9.9E-11	9.7E-13	1.6E+01	1.5E-11
Indeno(1,2,3-cd)pyrene	5.9E-08	5.8E-10	6.1E-01	3.5E-10
Phenanthrene	2.3E-08	2.2E-10		
TH-Total	3.6E-07	3.6E-09		
			Total pathway	1.9E-08
			Total Rad + Chem	2.3E-06

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	8.9E-02	4.4E-09	7.7E+00	3.4E-08
Aroclor-1260	5.2E-02	2.5E-09	7.7E+00	2.0E-08
Arsenic	7.3E+00	3.6E-07	1.8E+00	6.2E-07
Benzo(a)anthracene	5.5E+00	2.7E-07	7.3E-01	2.0E-07
Benzo(a)pyrene	9.4E+00	4.6E-07	7.3E+00	3.4E-06
Benzo(b)fluoranthene	6.2E+00	3.0E-07	7.3E-01	2.2E-07
Benzo(g,h,i)perylene	6.2E+00	3.0E-07		
Benzo(k)fluoranthene	7.3E+00	3.6E-07	7.3E-02	2.6E-08
Beryllium	9.4E-01	4.6E-08	4.3E+00	2.0E-07
Lead	2.5E+01	1.2E-06		
Dibenzo(a,h)anthracene	1.9E+00	9.3E-08	7.3E+00	6.8E-07
Dieldrin	1.0E-02	4.9E-10	1.6E+01	7.8E-09
Indeno(1,2,3-cd)pyrene	6.0E+00	2.9E-07	7.3E-01	2.1E-07
Phenanthrene	2.3E+00	1.1E-07		
TH-Total	3.7E+01	1.8E-06		
			Total Pathway	5.6E-06
			Total Rad + Chem	7.9E-06

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CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil				External Radiation/Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable				CS-137	4.0E-01	2.0E-06	8.0E-07	8.0E-07
				NP-237	1.7E-01	4.3E-07	7.4E-08	7.9E-08
				PU-238	9.3E-02	2.8E-11	2.6E-12	3.0E-09
				PU-239/240	6.1E-02	2.7E-11	1.6E-12	2.0E-09
				RA-226	2.5E+01	6.0E-06	1.5E-04	1.5E-04
				RA-228	3.1E+00	2.9E-06	9.0E-06	9.0E-06
				SR-90	1.3E+00			5.1E-09
				TC-99	1.1E+02	6.0E-13	6.8E-11	1.6E-08
				TH-228	3.5E+00	5.6E-06	2.0E-05	2.2E-05
				TH-230	1.1E+01	5.4E-11	6.0E-10	3.8E-08
				TH-232	3.2E+00	8.5E-06	2.7E-05	2.7E-05
				U-234	6.9E+00	3.0E-11	2.1E-10	3.0E-08
				U-235/236	7.1E-01	2.4E-07	1.7E-07	2.1E-07
				U-238	7.4E+00	3.6E-08	2.7E-07	3.0E-07
Total Pathway:				Total Pathway			2.0E-04	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Aroclor-1254	1.5E-08	1.0E+01	1.5E-07					1.9E-07
Aroclor-1260	8.8E-09	1.0E+01	9.0E-08					1.1E-07
Arsenic	2.0E-08	1.8E+00	3.8E-08					6.7E-07
Benzo(a)anthracene			2.0E-07					3.9E-07
Benzo(a)pyrene			3.4E-06					6.7E-06
Benzo(b)fluoranthene			2.2E-07					4.4E-07
Benzo(g,h,i)perylene	5.2E-06			Not applicable				
Benzo(k)fluoranthene			2.6E-08					5.2E-08
Beryllium	2.6E-08		2.0E-07					4.0E-07
Lead	6.9E-07							
Dibenzo(a,h)anthracene			6.8E-07					1.4E-06
Dieldrin	1.7E-09	1.6E+01	2.7E-08					3.5E-08
Indeno(1,2,3-cd)pyrene			2.1E-07					4.3E-07
Phenanthrene	1.9E-06							
TH-Total	1.0E-06							
		Total Pathway	5.2E-06			Total Pathway:		

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 5.2E-06 | Total Rad + Chem 2.0E-04 | *Total:* 2.2E-04

TABLE B.3.2-11
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	HQ
CS-137	4.9E-06	8.6E-02		
NP-237	2.1E-06	3.7E-02		
PU-238	1.2E-06	2.0E-02		
PU-239/240	7.5E-07	1.3E-02		
RA-226	3.1E-04	5.3E+00		
RA-228	3.8E-05	6.7E-01		
SR-90	1.6E-05	2.8E-01		
TC-99	1.4E-03	2.5E+01		
TH-228	4.4E-05	7.6E-01		
TH-230	1.4E-04	2.4E+00		
TH-232	4.0E-05	6.9E-01		
U-234	8.6E-05	1.5E+00		
U-235/236	8.8E-06	1.5E-01		
U-238	9.2E-05	1.6E+00		

Total Pathway

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	HQ
CS-137	5.0E-01	4.4E+01		
NP-237	2.1E-01	1.9E+01		
PU-238	1.2E-01	1.0E+01		
PU-239/240	7.6E-02	6.7E+00		
RA-226	3.1E+01	2.7E+03		
RA-228	3.9E+00	3.4E+02		
SR-90	1.6E+00	1.4E+02		
TC-99	1.4E+02	1.2E+04		
TH-228	4.4E+00	3.9E+02		
TH-230	1.4E+01	1.2E+03		
TH-232	4.0E+00	3.5E+02		
U-234	8.7E+00	7.6E+02		
U-235/236	8.9E-01	7.8E+01		
U-238	9.3E+00	8.1E+02		

Total Pathway

Chemical Hazard

Inhalation/Soil

Compound	Conc'n in Soil (mg/kg)	Intake	RfD(i)	HQ
Aroclor-1254	8.8E-10	2.4E-11		
Aroclor-1260	5.2E-10	1.4E-11		
Arsenic	7.2E-08	2.0E-09		
Benzo(a)anthracene	5.5E-08	1.5E-09		
Benzo(a)pyrene	9.3E-08	2.6E-09		
Benzo(b)fluoranthene	6.1E-08	1.7E-09		
Benzo(g,h,i)perylene	6.2E-08	1.7E-09		
Benzo(k)fluoranthene	7.2E-08	2.0E-09		
Beryllium	9.3E-09	2.6E-10		
Lead	2.4E-07	6.7E-09		
Dibenzo(a,h)anthracene	1.9E-08	5.2E-10		
Dieldrin	9.9E-11	2.7E-12		
Indeno(1,2,3-cd)pyrene	5.9E-08	1.6E-09		
Phenanthrene	2.3E-08	6.2E-10		
TH-Total	3.6E-07	1.0E-08		

Total Pathway

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	HQ
Aroclor-1254	8.9E-02	1.2E-08		
Aroclor-1260	5.2E-02	7.1E-09		
Arsenic	7.3E+00	1.0E-06	3.0E-04	3.3E-03
Benzo(a)anthracene	5.5E+00	7.5E-07		
Benzo(a)pyrene	9.4E+00	1.3E-06		
Benzo(b)fluoranthene	6.2E+00	8.5E-07		
Benzo(g,h,i)perylene	6.2E+00	8.5E-07		
Benzo(k)fluoranthene	7.3E+00	1.0E-06		
Beryllium	9.4E-01	1.3E-07	5.0E-03	2.6E-05
Lead	2.5E+01	3.4E-06		
Dibenzo(a,h)anthracene	1.9E+00	2.6E-07		
Dieldrin	1.0E-02	1.4E-09	5.0E-05	2.7E-05
Indeno(1,2,3-cd)pyrene	6.0E+00	8.2E-07		
Phenanthrene	2.3E+00	3.2E-07		
TH-Total	3.7E+01	5.0E-06		

Total Pathway 3.4E-03

Total Rad + Chem

Total Rad + Chem 3.4E-03

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TABLE B.3.2-11
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Soil	**Total**
Not Applicable	

Chemical Hazard				
Dermal Contact/Soil				**Total**
Compound	Intake	RfD(derm)	HQ	
Aroclor-1254	4.2E-08			
Aroclor-1260	2.5E-08			
Arsenic	5.7E-08	2.9E-04	2.0E-04	3.5E-03
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene	1.5E-05			
Benzo(k)fluoranthene				
Beryllium	7.4E-08	5.0E-05	1.5E-03	1.5E-03
Lead	1.9E-06			
Dibenzo(a,h)anthracene				
Dieldrin	4.7E-09	5.0E-05	9.5E-05	1.2E-04
Indeno(1,2,3-cd)pyrene				
Phenanthrene	5.4E-06			
TH-Total	2.9E-06			
		Total Pathway	1.8E-03	
		Total Rad + Chem	1.8E-03	*Total:* 5.2E-03

TABLE B.3.2-12(a)
FUTURE, OFF-PROPERTY FARMER (Private Ownership)
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	Total
CS-137	1.30E-05	1.5E+00	1.9E-11	2.9E-11	2.9E-11
NP-237	5.56E-06	6.4E-01	2.9E-08	1.9E-08	1.9E-08
PU-238	3.02E-06	3.5E-01	3.9E-08	1.4E-08	1.4E-08
PU-239/240	1.98E-06	2.3E-01	3.8E-08	8.7E-09	8.7E-09
RA-226	8.01E-04	9.3E+01	7.0E-09	6.5E-07	6.5E-07
RA-228	1.01E-04	1.2E+01	6.9E-10	8.1E-09	8.1E-09
SR-90	4.16E-05	4.8E+00	6.2E-11	3.0E-10	3.0E-10
TC-99	3.69E-03	4.3E+02	8.3E-12	3.5E-09	3.5E-09
TH-228	1.15E-04	1.3E+01	7.8E-08	1.0E-06	1.0E-06
TH-230	3.59E-04	4.2E+01	2.9E-08	1.2E-06	1.2E-06
TH-232	1.04E-04	1.2E+01	1.1E-07	1.3E-06	1.3E-06
U-234	2.25E-04	2.6E+01	2.6E-08	6.8E-07	6.8E-07
U-235/236	2.31E-05	2.7E+00	2.5E-08	6.7E-08	6.7E-08
U-238	2.42E-04	2.8E+01	5.2E-08	1.5E-06	1.5E-06
			Total Pathway:	6.5E-06	

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	2.31E-09	1.5E-10			
Aroclor-1260	1.35E-09	8.7E-11			
Arsenic	1.89E-07	1.2E-08	1.5E+01	1.8E-07	1.8E-07
Benzo(a)anthracene	1.43E-07	9.3E-09	6.1E-01	5.7E-09	5.7E-09
Benzo(a)pyrene	2.44E-07	1.6E-08	6.1E+00	9.6E-08	9.6E-08
Benzo(b)fluoranthene	1.61E-07	1.0E-08	6.1E-01	6.4E-09	6.4E-09
Benzo(g,h,i)perylene	1.61E-07	1.0E-08			
Benzo(k)fluoranthene	1.90E-07	1.2E-08	6.1E-02	7.5E-10	7.5E-10
Beryllium	2.45E-08	1.6E-09	8.4E+00	1.3E-08	1.3E-08
Lead	6.39E-07	4.1E-08			
Dibenzo(a,h)anthracene	4.94E-08	3.2E-09	6.1E+00	2.0E-08	2.0E-08
Dieldrin	2.60E-10	1.7E-11	1.6E+01	2.7E-10	2.7E-10
Indeno(1,2,3-cd)pyrene	1.56E-07	1.0E-08	6.1E-01	6.2E-09	6.2E-09
Phenanthrene	5.98E-08	3.9E-09			
TH-Total	9.54E-07	6.2E-08			
			Total Pathway:	3.3E-07	

Total Rad + Chem 6.8E-06 *Total:* 6.8E-06

TABLE B.3.2-12(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.30E-05			
NP-237	5.56E-06			
PU-238	3.02E-06			
PU-239/240	1.98E-06			
RA-226	8.01E-04			
RA-228	1.01E-04			
SR-90	4.16E-05			
TC-99	3.69E-03			
TH-228	1.15E-04			
TH-230	3.59E-04			
TH-232	1.04E-04			
U-234	2.25E-04			
U-235/236	2.31E-05			
U-238	2.42E-04			

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	2.31E-09	1.5E-10		
Aroclor-1260	1.35E-09	8.7E-11		
Arsenic	1.89E-07	1.2E-08		
Benzo(a)anthracene	1.43E-07	9.3E-09		
Benzo(a)pyrene	2.44E-07	1.6E-08		
Benzo(b)fluoranthene	1.61E-07	1.0E-08		
Benzo(g,h,i)perylene	1.61E-07	1.0E-08		
Benzo(k)fluoranthene	1.90E-07	1.2E-08		
Beryllium	2.45E-08	1.6E-09		
Lead	6.39E-07	4.1E-08		
Dibenzo(a,h)anthracene	4.94E-08	3.2E-09		
Dieldrin	2.60E-10	1.7E-11		
Indeno(1,2,3-cd)pyrene	1.56E-07	1.0E-08		
Phenanthrene	5.98E-08	3.9E-09		
TH-Total	9.54E-07	6.2E-08		

Total Pathway:

Total Rad + Chem

Total
Total:

TABLE B.3.2-12(b)
FUTURE, OFF-PROPERTY CHILD (Private Ownership)
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.30E-05	2.7E-02	1.9E-11	5.2E-13	5.2E-13
NP-237	5.56E-06	1.2E-02	2.9E-08	3.4E-10	3.4E-10
PU-238	3.02E-06	6.3E-03	3.9E-08	2.5E-10	2.5E-10
PU-239/240	1.98E-06	4.2E-03	3.8E-08	1.6E-10	1.6E-10
RA-226	8.01E-04	1.7E+00	7.0E-09	1.2E-08	1.2E-08
RA-228	1.01E-04	2.1E-01	6.9E-10	1.5E-10	1.5E-10
SR-90	4.16E-05	8.7E-02	6.2E-11	5.4E-12	5.4E-12
TC-99	3.69E-03	7.7E+00	8.3E-12	6.4E-11	6.4E-11
TH-228	1.15E-04	2.4E-01	7.8E-08	1.9E-08	1.9E-08
TH-230	3.59E-04	7.5E-01	2.9E-08	2.2E-08	2.2E-08
TH-232	1.04E-04	2.2E-01	1.1E-07	2.4E-08	2.4E-08
U-234	2.25E-04	4.7E-01	2.6E-08	1.2E-08	1.2E-08
U-235/236	2.31E-05	4.9E-02	2.5E-08	1.2E-09	1.2E-09
U-238	2.42E-04	5.1E-01	5.2E-08	2.6E-08	2.6E-08
			Total Pathway:	1.2E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	2.31E-09	1.3E-11			
Aroclor-1260	1.35E-09	7.4E-12			
Arsenic	1.89E-07	1.0E-09	1.5E+01	1.6E-08	1.6E-08
Benzo(a)anthracene	1.43E-07	7.8E-10	6.1E-01	4.8E-10	4.8E-10
Benzo(a)pyrene	2.44E-07	1.3E-09	6.1E+00	8.2E-09	8.2E-09
Benzo(b)fluoranthene	1.61E-07	8.8E-10	6.1E-01	5.4E-10	5.4E-10
Benzo(g,h,i)perylene	1.61E-07	8.8E-10			
Benzo(k)fluoranthene	1.90E-07	1.0E-09	6.1E-02	6.4E-11	6.4E-11
Beryllium	2.45E-08	1.3E-10	8.4E+00	1.1E-09	1.1E-09
Lead	6.39E-07	3.5E-09			
Dibenzo(a,h)anthracene	4.94E-08	2.7E-10	6.1E+00	1.7E-09	1.7E-09
Dieldrin	2.60E-10	1.4E-12	1.6E+01	2.3E-11	2.3E-11
Indeno(1,2,3-cd)pyrene	1.56E-07	8.5E-10	6.1E-01	5.2E-10	5.2E-10
Phenanthrene	5.98E-08	3.3E-10			
TH-Total	9.54E-07	5.2E-09			
			Total Pathway:	2.8E-08	

Total Rad + Chem	1.5E-07	*Total:*	1.5E-07

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TABLE B.3.2-12(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.30E-05			
NP-237	5.56E-06			
PU-238	3.02E-06			
PU-239/240	1.98E-06			
RA-226	8.01E-04			
RA-228	1.01E-04			
SR-90	4.16E-05			
TC-99	3.69E-03			
TH-228	1.15E-04			
TH-230	3.59E-04			
TH-232	1.04E-04			
U-234	2.25E-04			
U-235/236	2.31E-05			
U-238	2.42E-04			

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	2.31E-09	1.5E-10		
Aroclor-1260	1.35E-09	8.6E-11		
Arsenic	1.89E-07	1.2E-08		
Benzo(a)anthracene	1.43E-07	9.1E-09		
Benzo(a)pyrene	2.44E-07	1.6E-08		
Benzo(b)fluoranthene	1.61E-07	1.0E-08		
Benzo(g,h,i)perylene	1.61E-07	1.0E-08		
Benzo(k)fluoranthene	1.90E-07	1.2E-08		
Beryllium	2.45E-08	1.6E-09		
Lead	6.39E-07	4.1E-08		
Dibenzo(a,h)anthracene	4.94E-08	3.2E-09		
Dieldrin	2.60E-10	1.7E-11		
Indeno(1,2,3-cd)pyrene	1.56E-07	1.0E-08		
Phenanthrene	5.98E-08	3.8E-09		
TH-Total	9.54E-07	6.1E-08		

Total Pathway:

Total Rad + Chem

Total

Total:

TABLE B.3.2-12(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	3.65E-07	4.2E-02	1.9E-11	8.0E-13	8.0E-13
NP-237	1.57E-07	1.8E-02	2.9E-08	5.3E-10	5.3E-10
PU-238	8.49E-08	9.8E-03	3.9E-08	3.8E-10	3.8E-10
PU-239/240	5.56E-08	6.4E-03	3.8E-08	2.4E-10	2.4E-10
RA-226	2.25E-05	2.6E+00	7.0E-09	1.8E-08	1.8E-08
RA-228	2.84E-06	3.3E-01	6.9E-10	2.3E-10	2.3E-10
SR-90	1.17E-06	1.4E-01	6.2E-11	8.4E-12	8.4E-12
TC-99	1.04E-04	1.2E+01	8.3E-12	1.0E-10	1.0E-10
TH-228	3.23E-06	3.7E-01	7.8E-08	2.9E-08	2.9E-08
TH-230	1.01E-05	1.2E+00	2.9E-08	3.4E-08	3.4E-08
TH-232	2.92E-06	3.4E-01	1.1E-07	3.7E-08	3.7E-08
U-234	6.33E-06	7.3E-01	2.6E-08	1.9E-08	1.9E-08
U-235/236	6.49E-07	7.5E-02	2.5E-08	1.9E-09	1.9E-09
U-238	6.81E-06	7.9E-01	5.2E-08	4.1E-08	4.1E-08
			Total Pathway:	1.8E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	6.51E-11	4.2E-12			
Aroclor-1260	3.80E-11	2.5E-12			
Arsenic	5.32E-09	3.4E-10	1.5E+01	5.2E-09	5.2E-09
Benzo(a)anthracene	4.02E-09	2.6E-10	6.1E-01	1.6E-10	1.6E-10
Benzo(a)pyrene	6.88E-09	4.5E-10	6.1E+00	2.7E-09	2.7E-09
Benzo(b)fluoranthene	4.54E-09	2.9E-10	6.1E-01	1.8E-10	1.8E-10
Benzo(g,h,i)perylene	4.54E-09	2.9E-10			
Benzo(k)fluoranthene	5.34E-09	3.5E-10	6.1E-02	2.1E-11	2.1E-11
Beryllium	6.89E-10	4.5E-11	8.4E+00	3.8E-10	3.8E-10
Lead	1.80E-08	1.2E-09			
Dibenzo(a,h)anthracene	1.39E-09	9.0E-11	6.1E+00	5.5E-10	5.5E-10
Dieldrin	7.32E-12	4.7E-13	1.6E+01	7.6E-12	7.6E-12
Indeno(1,2,3-cd)pyrene	4.39E-09	2.8E-10	6.1E-01	1.7E-10	1.7E-10
Phenanthrene	1.68E-09	1.1E-10			
TH-Total	2.69E-08	1.7E-09			
			Total Pathway:	9.4E-09	

Total Rad + Chem	1.9E-07	*Total:*	1.9E-07

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TABLE B.3.2-12(c)
(continued)

Noncarcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	3.65E-07			
NP-237	1.57E-07			
PU-238	8.49E-08			
PU-239/240	5.56E-08			
RA-226	2.25E-05			
RA-228	2.84E-06			
SR-90	1.17E-06			
TC-99	1.04E-04			
TH-228	3.23E-06			
TH-230	1.01E-05			
TH-232	2.92E-06			
U-234	6.33E-06			
U-235/236	6.49E-07			
U-238				

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	6.51E-11	4.2E-12		
Aroclor-1260	3.80E-11	2.5E-12		
Arsenic	5.32E-09	3.4E-10		
Benzo(a)anthracene	4.02E-09	2.6E-10		
Benzo(a)pyrene	6.88E-09	4.5E-10		
Benzo(b)fluoranthene	4.54E-09	2.9E-10		
Benzo(g,h,i)perylene	4.54E-09	2.9E-10		
Benzo(k)fluoranthene	5.34E-09	3.5E-10		
Beryllium	6.89E-10	4.5E-11		
Lead	1.80E-08	1.2E-09		
Dibenzo(a,h)anthracene	1.39E-09	9.0E-11		
Dieldrin	7.32E-12	4.7E-13		
Indeno(1,2,3-cd)pyrene	4.39E-09	2.8E-10		
Phenanthrene	1.68E-09	1.1E-10		
TH-Total	2.69E-08	1.7E-09		

Total Pathway:

Total Rad + Chem

Total
Total:

TABLE B.3.2-12(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					**Total**
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	3.65E-07	7.7E-04	1.9E-11	1.5E-14	1.5E-14
NP-237	1.57E-07	3.3E-04	2.9E-08	9.6E-12	9.6E-12
PU-238	8.49E-08	1.8E-04	3.9E-08	7.0E-12	7.0E-12
PU-239/240	5.56E-08	1.2E-04	3.8E-08	4.4E-12	4.4E-12
RA-226	2.25E-05	4.7E-02	7.0E-09	3.3E-10	3.3E-10
RA-228	2.84E-06	6.0E-03	6.9E-10	4.1E-12	4.1E-12
SR-90	1.17E-06	2.5E-03	6.2E-11	1.5E-13	1.5E-13
TC-99	1.04E-04	2.2E-01	8.3E-12	1.8E-12	1.8E-12
TH-228	3.23E-06	6.8E-03	7.8E-08	5.3E-10	5.3E-10
TH-230	1.01E-05	2.1E-02	2.9E-08	6.2E-10	6.2E-10
TH-232	2.92E-06	6.1E-03	1.1E-07	6.7E-10	6.7E-10
U-234	6.33E-06	1.3E-02	2.6E-08	3.5E-10	3.5E-10
U-235/236	6.49E-07	1.4E-03	2.5E-08	3.4E-11	3.4E-11
U-238	6.81E-06	1.4E-02	5.2E-08	7.4E-10	7.4E-10
			Total Pathway:	3.3E-09	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	6.51E-11	3.6E-13			
Aroclor-1260	3.80E-11	2.1E-13			
Arsenic	5.32E-09	2.9E-11	1.5E+01	4.4E-10	4.4E-10
Benzo(a)anthracene	4.02E-09	2.2E-11	6.1E-01	1.3E-11	1.3E-11
Benzo(a)pyrene	6.88E-09	3.8E-11	6.1E+00	2.3E-10	2.3E-10
Benzo(b)fluoranthene	4.54E-09	2.5E-11	6.1E-01	1.5E-11	1.5E-11
Benzo(g,h,i)perylene	4.54E-09	2.5E-11			
Benzo(k)fluoranthene	5.34E-09	2.9E-11	6.1E-02	1.8E-12	1.8E-12
Beryllium	6.89E-10	3.8E-12	8.4E+00	3.2E-11	3.2E-11
Lead	1.80E-08	9.9E-11			
Dibenzo(a,h)anthracene	1.39E-09	7.6E-12	6.1E+00	4.6E-11	4.6E-11
Dieldrin	7.32E-12	4.0E-14	1.6E+01	6.4E-13	6.4E-13
Indeno(1,2,3-cd)pyrene	4.39E-09	2.4E-11	6.1E-01	1.5E-11	1.5E-11
Phenanthrene	1.68E-09	9.2E-12			
TH-Total	2.69E-08	1.5E-10			
			Total Pathway:	7.9E-10	

Total Rad + Chem 4.1E-09 *Total:* 4.1E-09

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TABLE B.3.2-12(d)
(continued)

Noncarcinogenic Hazard

Radiation Hazard					
Inhalation of Particulates/Soil					**Total**
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	3.65E-07				
NP-237	1.57E-07				
PU-238	8.49E-08				
PU-239/240	5.56E-08				
RA-226	2.25E-05				
RA-228	2.84E-06				
SR-90	1.17E-06				
TC-99	1.04E-04				
TH-228	3.23E-06				
TH-230	1.01E-05				
TH-232	2.92E-06				
U-234	6.33E-06				
U-235/236	6.49E-07				
U-238					
			Total Pathway:		

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	6.51E-11	4.2E-12		
Aroclor-1260	3.80E-11	2.4E-12		
Arsenic	5.32E-09	3.4E-10		
Benzo(a)anthracene	4.02E-09	2.6E-10		
Benzo(a)pyrene	6.88E-09	4.4E-10		
Benzo(b)fluoranthene	4.54E-09	2.9E-10		
Benzo(g,h,i)perylene	4.54E-09	2.9E-10		
Benzo(k)fluoranthene	5.34E-09	3.4E-10		
Beryllium	6.89E-10	4.4E-11		
Lead	1.80E-08	1.2E-09		
Dibenzo(a,h)anthracene	1.39E-09	8.9E-11		
Dieldrin	7.32E-12	4.7E-13		
Indeno(1,2,3-cd)pyrene	4.39E-09	2.8E-10		
Phenanthrene	1.68E-09	1.1E-10		
TH-Total	2.69E-08	1.7E-09		
			Total Pathway:	

Total Rad + Chem | *Total:*

TABLE B.3.2-13(a)
FUTURE OFF-PROPERTY FARMER (Private Ownership)
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.93E-02	5.4E+01	2.8E-11	1.5E-09	CS-137	1.03E-02	7.5E+01	2.8E-11	2.1E-09	3.6E-09
NP-237	1.50E-05	2.8E-02	2.2E-10	6.1E-12	NP-237	1.36E-06	1.0E-02	2.2E-10	2.2E-12	8.3E-12
PU-238	7.66E-08	1.4E-04	2.2E-10	3.1E-14	PU-238	1.53E-08	1.1E-04	2.2E-10	2.5E-14	5.6E-14
PU-239/240	5.39E-08	9.9E-05	2.3E-10	2.3E-14	PU-239/240	1.08E-08	7.9E-05	2.3E-10	1.8E-14	4.1E-14
RA-226	1.43E-02	2.6E+01	7.8E-10	2.0E-08	RA-226	2.57E-02	1.9E+02	7.8E-10	1.5E-07	1.7E-07
RA-228	1.14E-03	2.1E+00	1.0E-10	2.1E-10	RA-228	2.07E-03	1.5E+01	1.0E-10	1.5E-09	1.7E-09
SR-90	1.40E-03	2.6E+00	3.6E-11	9.3E-11	SR-90	7.01E-03	5.2E+01	3.6E-11	1.9E-09	1.9E-09
TC-99	1.95E+00	3.6E+03	1.3E-12	4.7E-09	TC-99	2.29E+00	1.7E+04	1.3E-12	2.2E-08	2.7E-08
TH-228	2.80E-05	5.1E-02	5.5E-11	2.8E-12	TH-228	2.38E-05	1.7E-01	5.5E-11	9.6E-12	1.2E-11
TH-230	4.33E-04	8.0E-01	1.3E-11	1.0E-11	TH-230	3.61E-04	2.7E+00	1.3E-11	3.5E-11	4.5E-11
TH-232	1.26E-04	2.3E-01	1.7E-10	3.9E-11	TH-232	1.05E-04	7.7E-01	1.7E-10	1.3E-10	1.7E-10
U-234	1.94E-03	3.6E+00	1.6E-11	5.7E-11	U-234	5.83E-03	4.3E+01	1.6E-11	6.9E-10	7.4E-10
U-235/236	2.00E-04	3.7E-01	1.6E-11	5.9E-12	U-235/236	5.99E-04	4.4E+00	1.6E-11	7.0E-11	7.6E-11
U-238	2.09E-03	3.8E+00	2.8E-11	1.1E-10	U-238	6.27E-03	4.6E+01	2.8E-11	1.3E-09	1.4E-09
			Total Pathway:	2.7E-08				Total Pathway:	1.8E-07	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	2.04E-05	2.1E-08	7.7E+00	1.6E-07	Aroclor-1254	6.45E-06	2.6E-08	7.7E+00	2.0E-07	3.7E-07
Aroclor-1260	1.02E-04	1.1E-07	7.7E+00	8.1E-07	Aroclor-1260	3.24E-05	1.3E-07	7.7E+00	1.0E-06	1.8E-06
Arsenic	5.80E-05	6.0E-08	1.8E+00	1.0E-07	Arsenic	1.74E-06	7.1E-09	1.8E+00	1.3E-08	1.2E-07
Benzo(a)anthracene	7.97E-05	8.2E-08	7.3E-01	6.0E-08	Benzo(a)anthracene	2.53E-05	1.0E-07	7.3E-01	7.6E-08	1.4E-07
Benzo(a)pyrene	3.60E-04	3.7E-07	7.3E+00	2.7E-06	Benzo(a)pyrene	1.15E-04	4.7E-07	7.3E+00	3.4E-06	6.1E-06
Benzo(b)fluoranthene	2.44E-04	2.5E-07	7.3E-01	1.8E-07	Benzo(b)fluoranthene	7.76E-05	3.2E-07	7.3E-01	2.3E-07	4.2E-07
Benzo(g,h,i)perylene	3.06E-03	3.1E-06			Benzo(g,h,i)perylene	9.73E-04	4.0E-06			
Benzo(k)fluoranthene	1.72E-03	1.8E-06	7.3E-02	1.3E-07	Benzo(k)fluoranthene	5.43E-04	2.2E-06	7.3E-02	1.6E-07	2.9E-07
Beryllium	2.40E-06	2.5E-09	4.3E+00	1.1E-08	Beryllium	2.16E-09	8.9E-12	4.3E+00	3.8E-11	1.1E-08
Lead	9.52E-06	9.8E-09			Lead	7.93E-06	3.3E-08			
Dibenzo(a,h)anthracene	3.98E-04	4.1E-07	7.3E+00	3.0E-06	Dibenzo(a,h)anthracene	1.26E-04	5.2E-07	7.3E+00	3.8E-06	6.8E-06
Dieldrin	1.75E-10	1.8E-13	1.6E+01	2.9E-12	Dieldrin	5.52E-11	2.3E-13	1.6E+01	3.6E-12	6.5E-12
Indeno(1,2,3-cd)pyrene	6.79E-04	7.0E-07	7.3E-01	5.1E-07	Indeno(1,2,3-cd)pyrene	2.16E-04	8.9E-07	7.3E-01	6.5E-07	1.2E-06
Phenanthrene	2.47E-06	2.5E-09			Phenanthrene	7.93E-07	3.3E-09			
TH-Total	1.16E-06	1.2E-09			TH-Total	9.63E-07	4.0E-09			
			Total Pathway:	7.7E-06				Total Pathway:	9.6E-06	
			Total Rad + Chem	7.7E-06				Total Rad + Chem	9.8E-06	*Total:* 1.7E-05

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TABLE B.3.2-13(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	2.9E-02	5.4E+01		
NP-237	1.5E-05	2.8E-02		
PU-238	7.7E-08	1.4E-04		
PU-239/240	5.4E-08	9.9E-05		
RA-226	1.4E-02	2.6E+01		
RA-228	1.1E-03	2.1E+00		
SR-90	1.4E-03	2.6E+00		
TC-99	1.9E+00	3.6E+03		
TH-228	2.8E-05	5.1E-02		
TH-230	4.3E-04	8.0E-01		
TH-232	1.3E-04	2.3E-01		
U-234	1.9E-03	3.6E+00		
U-235/236	2.0E-04	3.7E-01		
U-238	2.1E-03	3.8E+00		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	1.03E-02	7.5E+01		
NP-237	1.36E-06	1.0E-02		
PU-238	1.53E-08	1.1E-04		
PU-239/240	1.08E-08	7.9E-05		
RA-226	2.57E-02	1.9E+02		
RA-228	2.07E-03	1.5E+01		
SR-90	7.01E-03	5.2E+01		
TC-99	2.29E+00	1.7E+04		
TH-228	2.38E-05	1.7E-01		
TH-230	3.61E-04	2.7E+00		
TH-232	1.05E-04	7.7E-01		
U-234	5.83E-03	4.3E+01		
U-235/236	5.99E-04	4.4E+00		
U-238	6.27E-03	4.6E+01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	2.0E-05	2.1E-08		
Aroclor-1260	1.0E-04	1.1E-07		
Arsenic	5.8E-05	6.0E-08	3.0E-04	2.0E-04
Benzo(a)anthracene	8.0E-05	8.2E-08		
Benzo(a)pyrene	3.6E-04	3.7E-07		
Benzo(b)fluoranthene	2.4E-04	2.5E-07		
Benzo(g,h,i)perylene	3.1E-03	3.1E-06		
Benzo(k)fluoranthene	1.7E-03	1.8E-06		
Beryllium	2.4E-06	2.5E-09	5.0E-03	4.9E-07
Lead	9.5E-06	9.8E-09		
Dibenzo(a,h)anthracene	4.0E-04	4.1E-07		
Dieldrin	1.7E-10	1.8E-13	5.0E-05	3.6E-09
Indeno(1,2,3-cd)pyrene	6.8E-04	7.0E-07		
Phenanthrene	2.5E-06	2.5E-09		
TH-Total	1.2E-06	1.2E-09		

Total Pathway: 2.0E-04

Total Rad + Chem 2.0E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254	6.4E-06	2.6E-08		
Aroclor-1260	3.2E-05	1.3E-07		
Arsenic	1.7E-06	7.1E-09	3.0E-04	2.4E-05
Benzo(a)anthracene	2.5E-05	1.0E-07		
Benzo(a)pyrene	1.1E-04	4.7E-07		
Benzo(b)fluoranthene	7.8E-05	3.2E-07		
Benzo(g,h,i)perylene	9.7E-04	4.0E-06		
Benzo(k)fluoranthene	5.4E-04	2.2E-06		
Beryllium	2.2E-09	8.9E-12	5.0E-03	1.8E-09
Lead	7.9E-06	3.3E-08		
Dibenzo(a,h)anthracene	1.3E-04	5.2E-07		
Dieldrin	5.5E-11	2.3E-13	5.0E-05	4.5E-09
Indeno(1,2,3-cd)pyrene	2.2E-04	8.9E-07		
Phenanthrene	7.9E-07	3.3E-09		
TH-Total	9.6E-07	4.0E-09		

Total Pathway: 2.4E-05

Total Rad + Chem 2.4E-05

Total	
	2.2E-04
	5.0E-07
	8.1E-09
Total:	2.2E-04

TABLE B.3.2-13(a)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	5.04E-06	9.3E-03	2.2E-10	2.0E-12
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.89E-04	9.0E-01	3.6E-11	3.2E-11
TC-99	3.43E+00	6.3E+03	1.3E-12	8.2E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.40E+00	2.6E+03	1.6E-11	4.1E-08
U-235/236	7.47E-02	1.4E+02	1.6E-11	2.2E-09
U-238	1.55E+00	2.8E+03	2.8E-11	8.0E-08
		Total Pathway:		1.3E-07

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.72E-07	3.5E-03	2.2E-10	7.6E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.48E-03	1.8E+01	3.6E-11	6.6E-10
TC-99	4.13E+00	3.0E+04	1.3E-12	3.9E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.35E+00	3.2E+04	1.6E-11	5.1E-07
U-235/236	2.32E-01	1.7E+03	1.6E-11	2.7E-08
U-238	4.80E+00	3.5E+04	2.8E-11	9.9E-07
			Total Pathway:	1.6E-06

	Total	Total Dust & Groundwater Affected
		3.6E-09
	2.8E-12	1.1E-11
		5.6E-14
		4.1E-14
		1.7E-07
		1.7E-09
	6.9E-10	2.6E-09
	4.8E-08	7.4E-08
		1.2E-11
		4.5E-11
		1.7E-10
	5.5E-07	5.5E-07
	2.9E-08	3.0E-08
	1.1E-06	1.1E-06

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	1.89E-18	1.9E-21		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	1.73E-04	1.8E-07		
		Total Pathway:		
		Total Rad + Chem		1.3E-07

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	1.62E-18	6.7E-21		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	5.67E-05	2.3E-07		
			Total Pathway:	
			Total Rad + Chem	1.6E-06

	Total	Total Dust & Groundwater Affected
		3.7E-07
		1.8E-06
		1.2E-07
		1.4E-07
		6.1E-06
		4.2E-07
		1.1E-08
		6.8E-06
		6.5E-12
		1.2E-06
Total:	1.7E-06	1.9E-05

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TABLE B.3.2-13(a)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	5.0E-06	9.3E-03		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	4.9E-04	9.0E-01		
TC-99	3.4E+00	6.3E+03		
TH-228				
TH-230				
TH-232				
U-234	1.4E+00	2.6E+03		
U-235/236	7.5E-02	1.4E+02		
U-238	1.5E+00	2.8E+03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	4.72E-07	3.5E-03		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	2.48E-03	1.8E+01		
TC-99	4.13E+00	3.0E+04		
TH-228				
TH-230				
TH-232				
U-234	4.35E+00	3.2E+04		
U-235/236	2.32E-01	1.7E+03		
U-238	4.80E+00	3.5E+04		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.9E-18	1.9E-21		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	1.7E-04	1.8E-07	3.0E-03	5.9E-05

Total Pathway: 5.9E-05

Total Rad + Chem 5.9E-05

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.6E-18	6.7E-21		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	5.7E-05	2.3E-07	3.0E-03	7.8E-05

Total Pathway: 7.8E-05

Total Rad + Chem 7.8E-05

	Total	Total Dust & Groundwater Affected
		2.2E-04
		5.0E-07
		8.1E-09
	1.4E-04	1.4E-04
Total:	1.4E-04	3.6E-04

TABLE B.3.2-13(b)
FUTURE OFF-PROPERTY CHILD (Private Ownership)
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.93E-02	1.8E+00	2.8E-11	5.0E-11	CS-137	1.03E-02	1.5E+01	2.8E-11	4.1E-10	4.6E-10
NP-237	1.50E-05	9.1E-04	2.2E-10	2.0E-13	NP-237	1.36E-06	1.9E-03	2.2E-10	4.3E-13	6.3E-13
PU-238	7.66E-08	4.7E-06	2.2E-10	1.0E-15	PU-238	1.53E-08	2.2E-05	2.2E-10	4.8E-15	5.8E-15
PU-239/240	5.39E-08	3.3E-06	2.3E-10	7.5E-16	PU-239/240	1.08E-08	1.5E-05	2.3E-10	3.5E-15	4.3E-15
RA-226	1.43E-02	8.7E-01	7.8E-10	6.8E-10	RA-226	2.57E-02	3.7E+01	7.8E-10	2.9E-08	2.9E-08
RA-228	1.14E-03	7.0E-02	1.0E-10	7.0E-12	RA-228	2.07E-03	3.0E+00	1.0E-10	3.0E-10	3.0E-10
SR-90	1.40E-03	8.5E-02	3.6E-11	3.1E-12	SR-90	7.01E-03	1.0E+01	3.6E-11	3.6E-10	3.6E-10
TC-99	1.95E+00	1.2E+02	1.3E-12	1.5E-10	TC-99	2.29E+00	3.3E+03	1.3E-12	4.3E-09	4.4E-09
TH-228	2.80E-05	1.7E-03	5.5E-11	9.4E-14	TH-228	2.38E-05	3.4E-02	5.5E-11	1.9E-12	2.0E-12
TH-230	4.33E-04	2.6E-02	1.3E-11	3.4E-13	TH-230	3.61E-04	5.2E-01	1.3E-11	6.7E-12	7.0E-12
TH-232	1.26E-04	7.7E-03	1.7E-10	1.3E-12	TH-232	1.05E-04	1.5E-01	1.7E-10	2.5E-11	2.7E-11
U-234	1.94E-03	1.2E-01	1.6E-11	1.9E-12	U-234	5.83E-03	8.3E+00	1.6E-11	1.3E-10	1.4E-10
U-235/236	2.00E-04	1.2E-02	1.6E-11	1.9E-13	U-235/236	5.99E-04	8.6E-01	1.6E-11	1.4E-11	1.4E-11
U-238	2.09E-03	1.3E-01	2.8E-11	3.6E-12	U-238	6.27E-03	9.0E+00	2.8E-11	2.5E-10	2.5E-10
			Total Pathway:	9.0E-10				Total Pathway:	3.4E-08	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	2.04E-05	3.2E-09	7.7E+00	2.5E-08	Aroclor-1254	6.45E-06	2.4E-08	7.7E+00	1.8E-07	2.1E-07
Aroclor-1260	1.02E-04	1.6E-08	7.7E+00	1.3E-07	Aroclor-1260	3.24E-05	1.2E-07	7.7E+00	9.3E-07	1.1E-06
Arsenic	5.80E-05	9.2E-09	1.8E+00	1.6E-08	Arsenic	1.74E-06	6.5E-09	1.8E+00	1.1E-08	2.7E-08
Benzo(a)anthracene	7.97E-05	1.3E-08	7.3E-01	9.2E-09	Benzo(a)anthracene	2.53E-05	9.4E-08	7.3E-01	6.9E-08	7.8E-08
Benzo(a)pyrene	3.60E-04	5.7E-08	7.3E+00	4.2E-07	Benzo(a)pyrene	1.15E-04	4.3E-07	7.3E+00	3.1E-06	3.5E-06
Benzo(b)fluoranthene	2.44E-04	3.9E-08	7.3E-01	2.8E-08	Benzo(b)fluoranthene	7.76E-05	2.9E-07	7.3E-01	2.1E-07	2.4E-07
Benzo(g,h,i)perylene	3.06E-03	4.9E-07			Benzo(g,h,i)perylene	9.73E-04	3.6E-06			
Benzo(k)fluoranthene	1.72E-03	2.7E-07	7.3E-02	2.0E-08	Benzo(k)fluoranthene	5.43E-04	2.0E-06	7.3E-02	1.5E-07	1.7E-07
Beryllium	2.40E-06	3.8E-10	4.3E+00	1.6E-09	Beryllium	2.16E-09	8.1E-12	4.3E+00	3.5E-11	1.7E-09
Lead	9.52E-06	1.5E-09			Lead	7.93E-06	3.0E-08			
Dibenzo(a,h)anthracene	3.98E-04	6.3E-08	7.3E+00	4.6E-07	Dibenzo(a,h)anthracene	1.26E-04	4.7E-07	7.3E+00	3.4E-06	3.9E-06
Dieldrin	1.75E-10	2.8E-14	1.6E+01	4.4E-13	Dieldrin	5.52E-11	2.1E-13	1.6E+01	3.3E-12	3.7E-12
Indeno(1,2,3-cd)pyrene	6.79E-04	1.1E-07	7.3E-01	7.9E-08	Indeno(1,2,3-cd)pyrene	2.16E-04	8.0E-07	7.3E-01	5.9E-07	6.7E-07
Phenanthrene	2.47E-06	3.9E-10			Phenanthrene	7.93E-07	3.0E-09			
TH-Total	1.16E-06	1.8E-10			TH-Total	9.63E-07	3.6E-09			
			Total Pathway:	1.2E-06				Total Pathway:	8.7E-06	
			Total Rad + Chem	1.2E-06				Total Rad + Chem	8.7E-06	*Total:* 9.9E-06

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TABLE B.3.2-13(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	2.9E-02	1.8E+00		
NP-237	1.5E-05	9.1E-04		
PU-238	7.7E-08	4.7E-06		
PU-239/240	5.4E-08	3.3E-06		
RA-226	1.4E-02	8.7E-01		
RA-228	1.1E-03	7.0E-02		
SR-90	1.4E-03	8.5E-02		
TC-99	1.9E+00	1.2E+02		
TH-228	2.8E-05	1.7E-03		
TH-230	4.3E-04	2.6E-02		
TH-232	1.3E-04	7.7E-03		
U-234	1.9E-03	1.2E-01		
U-235/236	2.0E-04	1.2E-02		
U-238	2.1E-03	1.3E-01		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	1.03E-02	1.5E+01		
NP-237	1.36E-06	1.9E-03		
PU-238	1.53E-08	2.2E-05		
PU-239/240	1.08E-08	1.5E-05		
RA-226	2.57E-02	3.7E+01		
RA-228	2.07E-03	3.0E+00		
SR-90	7.01E-03	1.0E+01		
TC-99	2.29E+00	3.3E+03		
TH-228	2.38E-05	3.4E-02		
TH-230	3.61E-04	5.2E-01		
TH-232	1.05E-04	1.5E-01		
U-234	5.83E-03	8.3E+00		
U-235/236	5.99E-04	8.6E-01		
U-238	6.27E-03	9.0E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	2.0E-05	3.8E-08		
Aroclor-1260	1.0E-04	1.9E-07		
Arsenic	5.8E-05	1.1E-07	3.0E-04	3.6E-04
Benzo(a)anthracene	8.0E-05	1.5E-07		
Benzo(a)pyrene	3.6E-04	6.7E-07		
Benzo(b)fluoranthene	2.4E-04	4.5E-07		
Benzo(g,h,i)perylene	3.1E-03	5.7E-06		
Benzo(k)fluoranthene	1.7E-03	3.2E-06		
Beryllium	2.4E-06	4.5E-09	5.0E-03	8.9E-07
Lead	9.5E-06	1.8E-08		
Dibenzo(a,h)anthracene	4.0E-04	7.4E-07		
Dieldrin	1.7E-10	3.2E-13	5.0E-05	6.5E-09
Indeno(1,2,3-cd)pyrene	6.8E-04	1.3E-06		
Phenanthrene	2.5E-06	4.6E-09		
TH-Total	1.2E-06	2.1E-09		

Total Pathway: 3.6E-04

Total Rad + Chem 3.6E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	Total
Aroclor-1254	6.4E-06	2.8E-07			
Aroclor-1260	3.2E-05	1.4E-06			
Arsenic	1.7E-06	7.6E-08	3.0E-04	2.5E-04	6.1E-04
Benzo(a)anthracene	2.5E-05	1.1E-06			
Benzo(a)pyrene	1.1E-04	5.0E-06			
Benzo(b)fluoranthene	7.8E-05	3.4E-06			
Benzo(g,h,i)perylene	9.7E-04	4.2E-05			
Benzo(k)fluoranthene	5.4E-04	2.4E-05			
Beryllium	2.2E-09	9.4E-11	5.0E-03	1.9E-08	9.1E-07
Lead	7.9E-06	3.4E-07			
Dibenzo(a,h)anthracene	1.3E-04	5.5E-06			
Dieldrin	5.5E-11	2.4E-12	5.0E-05	4.8E-08	5.5E-08
Indeno(1,2,3-cd)pyrene	2.2E-04	9.4E-06			
Phenanthrene	7.9E-07	3.4E-08			
TH-Total	9.6E-07	4.2E-08			

Total Pathway: 2.5E-04

Total Rad + Chem 2.5E-04 *Total:* 6.1E-04

TABLE B.3.2-13(b)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	5.04E-06	3.1E-04	2.2E-10	6.8E-14
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.89E-04	3.0E-02	3.6E-11	1.1E-12
TC-99	3.43E+00	2.1E+02	1.3E-12	2.7E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.40E+00	8.5E+01	1.6E-11	1.4E-09
U-235/236	7.47E-02	4.5E+00	1.6E-11	7.3E-11
U-238	1.55E+00	9.4E+01	2.8E-11	2.6E-09
			Total Pathway:	4.3E-09

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	4.72E-07	6.7E-04	2.2E-10	1.5E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.48E-03	3.5E+00	3.6E-11	1.3E-10
TC-99	4.13E+00	5.9E+03	1.3E-12	7.7E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.35E+00	6.2E+03	1.6E-11	9.9E-08
U-235/236	2.32E-01	3.3E+02	1.6E-11	5.3E-09
U-238	4.80E+00	6.9E+03	2.8E-11	1.9E-07
			Total Pathway:	3.0E-07

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	1.89E-18	3.0E-22		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	1.73E-04	2.8E-08		
			Total Pathway:	
			Total Rad + Chem	4.3E-09

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	1.62E-18	6.1E-21		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	5.67E-05	2.1E-07		
			Total Pathway:	
			Total Rad + Chem	3.0E-07

	Total	Total Dust & Groundwater Affected
		4.6E-10
	2.2E-13	8.5E-13
		5.8E-15
		4.3E-15
		2.9E-08
		3.0E-10
	1.3E-10	4.9E-10
	7.9E-09	1.2E-08
		2.0E-12
		7.0E-12
		2.7E-11
	1.0E-07	1.0E-07
	5.4E-09	5.4E-09
	1.9E-07	1.9E-07
		2.1E-07
		1.1E-06
		2.7E-08
		7.8E-08
		3.5E-06
		2.4E-07
		1.7E-09
		3.9E-06
		3.7E-12
		6.7E-07
Total:	3.1E-07	1.0E-05

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TABLE B.3.2-13(b)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	5.0E-06	3.1E-04			NP-237	4.72E-07					
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	4.9E-04	3.0E-02			SR-90	2.48E-03					
TC-99	3.4E+00	2.1E+02			TC-99	4.13E+00					
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	1.4E+00	8.5E+01			U-234	4.35E+00					
U-235/236	7.5E-02	4.5E+00			U-235/236	2.32E-01					
U-238	1.5E+00	9.4E+01			U-238	4.80E+00					
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			6.1E-04
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			9.1E-07
Lead	1.9E-18	3.5E-21			Lead	1.6E-18	7.1E-20				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			5.5E-08
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate			5.0E-03		Tributyl phosphate			5.0E-03			
U-Total	1.7E-04	3.2E-07	3.0E-03	1.1E-04	U-Total	5.7E-05	2.5E-06	3.0E-03	8.2E-04	9.3E-04	9.3E-04
			Total Pathway:	1.1E-04				Total Pathway:	8.2E-04		
			Total Rad + Chem	1.1E-04				Total Rad + Chem	8.2E-04	*Total:* 9.3E-04	1.5E-03

TABLE B.3.2-13(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	3.60E-04	6.6E-01	2.8E-11	1.9E-11	CS-137	1.26E-04	9.3E-01	2.8E-11	2.6E-11	4.4E-11
NP-237	2.80E-07	5.1E-04	2.2E-10	1.1E-13	NP-237	2.55E-08	1.9E-04	2.2E-10	4.1E-14	1.5E-13
PU-238	1.66E-09	3.1E-06	2.2E-10	6.7E-16	PU-238	3.33E-10	2.4E-06	2.2E-10	5.4E-16	1.2E-15
PU-239/240	1.19E-09	2.2E-06	2.3E-10	5.0E-16	PU-239/240	2.37E-10	1.7E-06	2.3E-10	4.0E-16	9.0E-16
RA-226	2.46E-04	4.5E-01	7.8E-10	3.5E-10	RA-226	4.43E-04	3.3E+00	7.8E-10	2.5E-09	2.9E-09
RA-228	2.31E-05	4.2E-02	1.0E-10	4.2E-12	RA-228	4.18E-05	3.1E-01	1.0E-10	3.1E-11	3.5E-11
SR-90	1.22E-05	2.2E-02	3.6E-11	8.1E-13	SR-90	6.11E-05	4.5E-01	3.6E-11	1.6E-11	1.7E-11
TC-99	2.91E-02	5.4E+01	1.3E-12	7.0E-11	TC-99	3.43E-02	2.5E+02	1.3E-12	3.3E-10	4.0E-10
TH-228	5.90E-07	1.1E-03	5.5E-11	6.0E-14	TH-228	5.02E-07	3.7E-03	5.5E-11	2.0E-13	2.6E-13
TH-230	1.08E-05	2.0E-02	1.3E-11	2.6E-13	TH-230	8.99E-06	6.6E-02	1.3E-11	8.6E-13	1.1E-12
TH-232	3.13E-06	5.8E-03	1.7E-10	9.8E-13	TH-232	2.61E-06	1.9E-02	1.7E-10	3.3E-12	4.2E-12
U-234	4.03E-05	7.4E-02	1.6E-11	1.2E-12	U-234	1.21E-04	8.9E-01	1.6E-11	1.4E-11	1.5E-11
U-235/236	4.13E-06	7.6E-03	1.6E-11	1.2E-13	U-235/236	1.24E-05	9.1E-02	1.6E-11	1.5E-12	1.6E-12
U-238	4.34E-05	8.0E-02	2.8E-11	2.2E-12	U-238	1.30E-04	9.6E-01	2.8E-11	2.7E-11	2.9E-11
			Total Pathway:	4.5E-10				Total Pathway:	3.0E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	3.95E-07	4.1E-10	7.7E+00	3.1E-09	Aroclor-1254	1.25E-07	5.1E-10	7.7E+00	4.0E-09	7.1E-09
Aroclor-1260	2.44E-06	2.5E-09	7.7E+00	1.9E-08	Aroclor-1260	7.71E-07	3.2E-09	7.7E+00	2.4E-08	4.4E-08
Arsenic	6.32E-07	6.5E-10	1.8E+00	1.1E-09	Arsenic	1.90E-08	7.8E-11	1.8E+00	1.4E-10	1.3E-09
Benzo(a)anthracene	1.62E-06	1.7E-09	7.3E-01	1.2E-09	Benzo(a)anthracene	5.15E-07	2.1E-09	7.3E-01	1.5E-09	2.8E-09
Benzo(a)pyrene	7.48E-06	7.7E-09	7.3E+00	5.6E-08	Benzo(a)pyrene	2.38E-06	9.8E-09	7.3E+00	7.1E-08	1.3E-07
Benzo(b)fluoranthene	5.08E-06	5.2E-09	7.3E-01	3.8E-09	Benzo(b)fluoranthene	1.61E-06	6.6E-09	7.3E-01	4.8E-09	8.6E-09
Benzo(g,h,i)perylene	6.46E-05	6.6E-08			Benzo(g,h,i)perylene	2.05E-05	8.4E-08			
Benzo(k)fluoranthene	3.64E-05	3.7E-08	7.3E-02	2.7E-09	Benzo(k)fluoranthene	1.15E-05	4.7E-08	7.3E-02	3.5E-09	6.2E-09
Beryllium	4.20E-08	4.3E-11	4.3E+00	1.9E-10	Beryllium	3.78E-11	1.6E-13	4.3E+00	6.7E-13	1.9E-10
Lead	2.00E-07	2.0E-10			Lead	1.66E-07	6.8E-10			
Dibenzo(a,h)anthracene	8.37E-06	8.6E-09	7.3E+00	6.3E-08	Dibenzo(a,h)anthracene	2.66E-06	1.1E-08	7.3E+00	8.0E-08	1.4E-07
Dieldrin	2.47E-12	2.5E-15	1.6E+01	4.1E-14	Dieldrin	7.80E-13	3.2E-15	1.6E+01	5.1E-14	9.2E-14
Indeno(1,2,3-cd)pyrene	1.42E-05	1.5E-08	7.3E-01	1.1E-08	Indeno(1,2,3-cd)pyrene	4.52E-06	1.9E-08	7.3E-01	1.4E-08	2.4E-08
Phenanthrene	5.02E-08	5.2E-11			Phenanthrene	1.61E-08	6.6E-11			
TH-Total	2.88E-08	3.0E-11			TH-Total	2.40E-08	9.9E-11			
			Total Pathway:	1.6E-07				Total Pathway:	2.0E-07	
			Total Rad + Chem	1.6E-07				Total Rad + Chem	2.1E-07	*Total:* 3.7E-07

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TABLE B.3.2-13(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	3.6E-04	6.6E-01			CS-137	1.26E-04	9.3E-01			
NP-237	2.8E-07	5.1E-04			NP-237	2.55E-08	1.9E-04			
PU-238	1.7E-09	3.1E-06			PU-238	3.33E-10	2.4E-06			
PU-239/240	1.2E-09	2.2E-06			PU-239/240	2.37E-10	1.7E-06			
RA-226	2.5E-04	4.5E-01			RA-226	4.43E-04	3.3E+00			
RA-228	2.3E-05	4.2E-02			RA-228	4.18E-05	3.1E-01			
SR-90	1.2E-05	2.2E-02			SR-90	6.11E-05	4.5E-01			
TC-99	2.9E-02	5.4E+01			TC-99	3.43E-02	2.5E+02			
TH-228	5.9E-07	1.1E-03			TH-228	5.02E-07	3.7E-03			
TH-230	1.1E-05	2.0E-02			TH-230	8.99E-06	6.6E-02			
TH-232	3.1E-06	5.8E-03			TH-232	2.61E-06	1.9E-02			
U-234	4.0E-05	7.4E-02			U-234	1.21E-04	8.9E-01			
U-235/236	4.1E-06	7.6E-03			U-235/236	1.24E-05	9.1E-02			
U-238	4.3E-05	8.0E-02			U-238	1.30E-04	9.6E-01			

Total Pathway:

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.0E-07	4.1E-10			Aroclor-1254	1.2E-07	5.1E-10			
Aroclor-1260	2.4E-06	2.5E-09			Aroclor-1260	7.7E-07	3.2E-09			
Arsenic	6.3E-07	6.5E-10	3.0E-04	2.2E-06	Arsenic	1.9E-08	7.8E-11	3.0E-04	2.6E-07	2.4E-06
Benzo(a)anthracene	1.6E-06	1.7E-09			Benzo(a)anthracene	5.2E-07	2.1E-09			
Benzo(a)pyrene	7.5E-06	7.7E-09			Benzo(a)pyrene	2.4E-06	9.8E-09			
Benzo(b)fluoranthene	5.1E-06	5.2E-09			Benzo(b)fluoranthene	1.6E-06	6.6E-09			
Benzo(g,h,i)perylene	6.5E-05	6.6E-08			Benzo(g,h,i)perylene	2.1E-05	8.4E-08			
Benzo(k)fluoranthene	3.6E-05	3.7E-08			Benzo(k)fluoranthene	1.2E-05	4.7E-08			
Beryllium	4.2E-08	4.3E-11	5.0E-03	8.6E-09	Beryllium	3.8E-11	1.6E-13	5.0E-03	3.1E-11	8.7E-09
Lead	2.0E-07	2.0E-10			Lead	1.7E-07	6.8E-10			
Dibenzo(a,h)anthracene	8.4E-06	8.6E-09			Dibenzo(a,h)anthracene	2.7E-06	1.1E-08			
Dieldrin	2.5E-12	2.5E-15	5.0E-05	5.1E-11	Dieldrin	7.8E-13	3.2E-15	5.0E-05	6.4E-11	1.1E-10
Indeno(1,2,3-cd)pyrene	1.4E-05	1.5E-08			Indeno(1,2,3-cd)pyrene	4.5E-06	1.9E-08			
Phenanthrene	5.0E-08	5.2E-11			Phenanthrene	1.6E-08	6.6E-11			
TH-Total	2.9E-08	3.0E-11			TH-Total	2.4E-08	9.9E-11			

Total Pathway: 2.2E-06

Total Pathway: 2.6E-07

Total Rad + Chem 2.2E-06

Total Rad + Chem 2.6E-07 *Total:* 2.4E-06

TABLE B.3.2-13(c)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			4.4E-11
NP-237	5.04E-06	9.3E-03	2.2E-10	2.0E-12	NP-237	4.72E-07	3.5E-03	2.2E-10	7.6E-13	2.8E-12	3.0E-12
PU-238			2.2E-10		PU-238			2.2E-10			1.2E-15
PU-239/240			2.3E-10		PU-239/240			2.3E-10			9.0E-16
RA-226			7.8E-10		RA-226			7.8E-10			2.9E-09
RA-228			1.0E-10		RA-228			1.0E-10			3.5E-11
SR-90	4.89E-04	9.0E-01	3.6E-11	3.2E-11	SR-90	2.48E-03	1.8E+01	3.6E-11	6.6E-10	6.9E-10	7.1E-10
TC-99	3.43E+00	6.3E+03	1.3E-12	8.2E-09	TC-99	4.13E+00	3.0E+04	1.3E-12	3.9E-08	4.8E-08	4.8E-08
TH-228			5.5E-11		TH-228			5.5E-11			2.6E-13
TH-230			1.3E-11		TH-230			1.3E-11			1.1E-12
TH-232			1.7E-10		TH-232			1.7E-10			4.2E-12
U-234	1.40E+00	2.6E+03	1.6E-11	4.1E-08	U-234	4.35E+00	3.2E+04	1.6E-11	5.1E-07	5.5E-07	5.5E-07
U-235/236	7.47E-02	1.4E+02	1.6E-11	2.2E-09	U-235/236	2.32E-01	1.7E+03	1.6E-11	2.7E-08	2.9E-08	2.9E-08
U-238	1.55E+00	2.8E+03	2.8E-11	8.0E-08	U-238	4.80E+00	3.5E+04	2.8E-11	9.9E-07	1.1E-06	1.1E-06
			Total Pathway:	1.3E-07				Total Pathway:	1.6E-06		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			7.1E-09
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			4.4E-08
Arsenic			1.8E+00		Arsenic			1.8E+00			1.3E-09
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			2.8E-09
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			1.3E-07
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			8.6E-09
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02			
Beryllium			4.3E+00		Beryllium			4.3E+00			1.9E-10
Lead	1.89E-18	1.9E-21			Lead	1.62E-18	6.7E-21				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			1.4E-07
Dieldrin			1.6E+01		Dieldrin			1.6E+01			9.2E-14
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			2.4E-08
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate					Tributyl phosphate						
U-Total	1.73E-04	1.8E-07			U-Total	5.67E-05	2.3E-07				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	1.3E-07				Total Rad + Chem	1.6E-06	*Total:* 1.7E-06	2.1E-06

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TABLE B.3.2-13(c)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	5.0E-06	9.3E-03			NP-237	4.72E-07					
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	4.9E-04	9.0E-01			SR-90	2.48E-03					
TC-99	3.4E+00	6.3E+03			TC-99	4.13E+00					
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	1.4E+00	2.6E+03			U-234	4.35E+00					
U-235/236	7.5E-02	1.4E+02			U-235/236	2.32E-01					
U-238	1.5E+00	2.8E+03									
			Total Pathway:								

Chemical Hazard

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			2.4E-06
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			8.7E-09
Lead	1.9E-18	1.9E-21			Lead	1.6E-18	6.7E-21				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			1.1E-10
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate			5.0E-03		Tributyl phosphate			5.0E-03			
U-Total	1.7E-04	1.8E-07	3.0E-03	5.9E-05	U-Total	5.7E-05	2.3E-07	3.0E-03	7.8E-05	1.4E-04	1.4E-04
			Total Pathway:	5.9E-05				Total Pathway:	7.8E-05		
			Total Rad + Chem	5.9E-05				Total Rad + Chem	7.8E-05	*Total:* 1.4E-04	1.4E-04

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TABLE B.3.2-13(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	3.60E-04	2.2E-02	2.8E-11	6.1E-13	CS-137	1.26E-04	1.8E-01	2.8E-11	5.0E-12	5.7E-12
NP-237	2.80E-07	1.7E-05	2.2E-10	3.8E-15	NP-237	2.55E-08	3.6E-05	2.2E-10	8.0E-15	1.2E-14
PU-238	1.66E-09	1.0E-07	2.2E-10	2.2E-17	PU-238	3.33E-10	4.8E-07	2.2E-10	1.0E-16	1.3E-16
PU-239/240	1.19E-09	7.2E-08	2.3E-10	1.7E-17	PU-239/240	2.37E-10	3.4E-07	2.3E-10	7.8E-17	9.5E-17
RA-226	2.46E-04	1.5E-02	7.8E-10	1.2E-11	RA-226	4.43E-04	6.3E-01	7.8E-10	4.9E-10	5.1E-10
RA-228	2.31E-05	1.4E-03	1.0E-10	1.4E-13	RA-228	4.18E-05	6.0E-02	1.0E-10	6.0E-12	6.1E-12
SR-90	1.22E-05	7.4E-04	3.6E-11	2.7E-14	SR-90	6.11E-05	8.7E-02	3.6E-11	3.1E-12	3.2E-12
TC-99	2.91E-02	1.8E+00	1.3E-12	2.3E-12	TC-99	3.43E-02	4.9E+01	1.3E-12	6.4E-11	6.6E-11
TH-228	5.90E-07	3.6E-05	5.5E-11	2.0E-15	TH-228	5.02E-07	7.2E-04	5.5E-11	3.9E-14	4.1E-14
TH-230	1.08E-05	6.6E-04	1.3E-11	8.5E-15	TH-230	8.99E-06	1.3E-02	1.3E-11	1.7E-13	1.8E-13
TH-232	3.13E-06	1.9E-04	1.7E-10	3.2E-14	TH-232	2.61E-06	3.7E-03	1.7E-10	6.3E-13	6.7E-13
U-234	4.03E-05	2.5E-03	1.6E-11	3.9E-14	U-234	1.21E-04	1.7E-01	1.6E-11	2.8E-12	2.8E-12
U-235/236	4.13E-06	2.5E-04	1.6E-11	4.0E-15	U-235/236	1.24E-05	1.8E-02	1.6E-11	2.8E-13	2.9E-13
U-238	4.34E-05	2.6E-03	2.8E-11	7.4E-14	U-238	1.30E-04	1.9E-01	2.8E-11	5.2E-12	5.3E-12
			Total Pathway:	1.5E-11				Total Pathway:	5.8E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	3.95E-07	6.3E-11	7.7E+00	4.8E-10	Aroclor-1254	1.25E-07	4.7E-10	7.7E+00	3.6E-09	4.1E-09
Aroclor-1260	2.44E-06	3.9E-10	7.7E+00	3.0E-09	Aroclor-1260	7.71E-07	2.9E-09	7.7E+00	2.2E-08	2.5E-08
Arsenic	6.32E-07	1.0E-10	1.8E+00	1.8E-10	Arsenic	1.90E-08	7.1E-11	1.8E+00	1.2E-10	3.0E-10
Benzo(a)anthracene	1.62E-06	2.6E-10	7.3E-01	1.9E-10	Benzo(a)anthracene	5.15E-07	1.9E-09	7.3E-01	1.4E-09	1.6E-09
Benzo(a)pyrene	7.48E-06	1.2E-09	7.3E+00	8.7E-09	Benzo(a)pyrene	2.38E-06	8.9E-09	7.3E+00	6.5E-08	7.3E-08
Benzo(b)fluoranthene	5.08E-06	8.1E-10	7.3E-01	5.9E-10	Benzo(b)fluoranthene	1.61E-06	6.0E-09	7.3E-01	4.4E-09	5.0E-09
Benzo(g,h,i)perylene	6.46E-05	1.0E-08			Benzo(g,h,i)perylene	2.05E-05	7.7E-08			
Benzo(k)fluoranthene	3.64E-05	5.8E-09	7.3E-02	4.2E-10	Benzo(k)fluoranthene	1.15E-05	4.3E-08	7.3E-02	3.1E-09	3.6E-09
Beryllium	4.20E-08	6.7E-12	4.3E+00	2.9E-11	Beryllium	3.78E-11	1.4E-13	4.3E+00	6.1E-13	2.9E-11
Lead	2.00E-07	3.2E-11			Lead	1.66E-07	6.2E-10			
Dibenzo(a,h)anthracene	8.37E-06	1.3E-09	7.3E+00	9.7E-09	Dibenzo(a,h)anthracene	2.66E-06	9.9E-09	7.3E+00	7.2E-08	8.2E-08
Dieldrin	2.47E-12	3.9E-16	1.6E+01	6.3E-15	Dieldrin	7.80E-13	2.9E-15	1.6E+01	4.7E-14	5.3E-14
Indeno(1,2,3-cd)pyrene	1.42E-05	2.3E-09	7.3E-01	1.6E-09	Indeno(1,2,3-cd)pyrene	4.52E-06	1.7E-08	7.3E-01	1.2E-08	1.4E-08
Phenanthrene	5.02E-08	8.0E-12			Phenanthrene	1.61E-08	6.0E-11			
TH-Total	2.88E-08	4.6E-12			TH-Total	2.40E-08	9.0E-11			
			Total Pathway:	2.5E-08				Total Pathway:	1.8E-07	
			Total Rad + Chem	2.5E-08				Total Rad + Chem	1.8E-07	*Total:* 2.1E-07

TABLE B.3.2-13(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	3.6E-04	2.2E-02			CS-137	1.26E-04	1.8E-01			
NP-237	2.8E-07	1.7E-05			NP-237	2.55E-08	3.6E-05			
PU-238	1.7E-09	1.0E-07			PU-238	3.33E-10	4.8E-07			
PU-239/240	1.2E-09	7.2E-08			PU-239/240	2.37E-10	3.4E-07			
RA-226	2.5E-04	1.5E-02			RA-226	4.43E-04	6.3E-01			
RA-228	2.3E-05	1.4E-03			RA-228	4.18E-05	6.0E-02			
SR-90	1.2E-05	7.4E-04			SR-90	6.11E-05	8.7E-02			
TC-99	2.9E-02	1.8E+00			TC-99	3.43E-02	4.9E+01			
TH-228	5.9E-07	3.6E-05			TH-228	5.02E-07	7.2E-04			
TH-230	1.1E-05	6.6E-04			TH-230	8.99E-06	1.3E-02			
TH-232	3.1E-06	1.9E-04			TH-232	2.61E-06	3.7E-03			
U-234	4.0E-05	2.5E-03			U-234	1.21E-04	1.7E-01			
U-235/236	4.1E-06	2.5E-04			U-235/236	1.24E-05	1.8E-02			
U-238	4.3E-05	2.6E-03			U-238	1.30E-04	1.9E-01			

Total Pathway:

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.0E-07	7.3E-10			Aroclor-1254	1.2E-07	5.4E-09			
Aroclor-1260	2.4E-06	4.5E-09			Aroclor-1260	7.7E-07	3.4E-08			
Arsenic	6.3E-07	1.2E-09	3.0E-04	3.9E-06	Arsenic	1.9E-08	8.2E-10	3.0E-04	2.7E-06	6.7E-06
Benzo(a)anthracene	1.6E-06	3.0E-09			Benzo(a)anthracene	5.2E-07	2.2E-08			
Benzo(a)pyrene	7.5E-06	1.4E-08			Benzo(a)pyrene	2.4E-06	1.0E-07			
Benzo(b)fluoranthene	5.1E-06	9.4E-09			Benzo(b)fluoranthene	1.6E-06	7.0E-08			
Benzo(g,h,i)perylene	6.5E-05	1.2E-07			Benzo(g,h,i)perylene	2.1E-05	8.9E-07			
Benzo(k)fluoranthene	3.6E-05	6.7E-08			Benzo(k)fluoranthene	1.2E-05	5.0E-07			
Beryllium	4.2E-08	7.8E-11	5.0E-03	1.6E-08	Beryllium	3.8E-11	1.6E-12	5.0E-03	3.3E-10	1.6E-08
Lead	2.0E-07	3.7E-10			Lead	1.7E-07	7.2E-09			
Dibenzo(a,h)anthracene	8.4E-06	1.6E-08			Dibenzo(a,h)anthracene	2.7E-06	1.2E-07			
Dieldrin	2.5E-12	4.6E-15	5.0E-05	9.2E-11	Dieldrin	7.8E-13	3.4E-14	5.0E-05	6.8E-10	7.7E-10
Indeno(1,2,3-cd)pyrene	1.4E-05	2.6E-08			Indeno(1,2,3-cd)pyrene	4.5E-06	2.0E-07			
Phenanthrene	5.0E-08	9.3E-11			Phenanthrene	1.6E-08	7.0E-10			
TH-Total	2.9E-08	5.3E-11			TH-Total	2.4E-08	1.0E-09			

Total Pathway: 3.9E-06

Total Rad + Chem 3.9E-06

Total Pathway: 2.7E-06

Total Rad + Chem 2.7E-06 *Total:* 6.7E-06

TABLE B.3.2-13(d)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			5.7E-12
NP-237	5.04E-06	3.1E-04	2.2E-10	6.8E-14	NP-237	4.72E-07	6.7E-04	2.2E-10	1.5E-13	2.2E-13	2.3E-13
PU-238			2.2E-10		PU-238			2.2E-10			1.3E-16
PU-239/240			2.3E-10		PU-239/240			2.3E-10			9.5E-17
RA-226			7.8E-10		RA-226			7.8E-10			5.1E-10
RA-228			1.0E-10		RA-228			1.0E-10			6.1E-12
SR-90	4.89E-04	3.0E-02	3.6E-11	1.1E-12	SR-90	2.48E-03	3.5E+00	3.6E-11	1.3E-10	1.3E-10	1.3E-10
TC-99	3.43E+00	2.1E+02	1.3E-12	2.7E-10	TC-99	4.13E+00	5.9E+03	1.3E-12	7.7E-09	7.9E-09	8.0E-09
TH-228			5.5E-11		TH-228			5.5E-11			4.1E-14
TH-230			1.3E-11		TH-230			1.3E-11			1.8E-13
TH-232			1.7E-10		TH-232			1.7E-10			6.7E-13
U-234	1.40E+00	8.5E+01	1.6E-11	1.4E-09	U-234	4.35E+00	6.2E+03	1.6E-11	9.9E-08	1.0E-07	1.0E-07
U-235/236	7.47E-02	4.5E+00	1.6E-11	7.3E-11	U-235/236	2.32E-01	3.3E+02	1.6E-11	5.3E-09	5.4E-09	5.4E-09
U-238	1.55E+00	9.4E+01	2.8E-11	2.6E-09	U-238	4.80E+00	6.9E+03	2.8E-11	1.9E-07	1.9E-07	1.9E-07
			Total Pathway:	4.3E-09				Total Pathway:	3.0E-07		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			4.1E-09
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			2.5E-08
Arsenic			1.8E+00		Arsenic			1.8E+00			3.0E-10
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			1.6E-09
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			7.3E-08
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			5.0E-09
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02			
Beryllium			4.3E+00		Beryllium			4.3E+00			2.9E-11
Lead	1.89E-18	3.0E-22			Lead	1.62E-18	6.1E-21				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			8.2E-08
Dieldrin			1.6E+01		Dieldrin			1.6E+01			5.3E-14
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			1.4E-08
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate					Tributyl phosphate						
U-Total	1.73E-04	2.8E-08			U-Total	5.67E-05	2.1E-07				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	4.3E-09				Total Rad + Chem	3.0E-07	*Total:* 3.1E-07	5.1E-07

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TABLE B.3.2-13(d)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	5.0E-06	3.1E-04			NP-237	4.72E-07					
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	4.9E-04	3.0E-02			SR-90	2.48E-03					
TC-99	3.4E+00	2.1E+02			TC-99	4.13E+00					
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	1.4E+00	8.5E+01			U-234	4.35E+00					
U-235/236	7.5E-02	4.5E+00			U-235/236	2.32E-01					
U-238	1.5E+00	9.4E+01									
			Total Pathway:								

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			6.7E-06
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			1.6E-08
Lead	1.9E-18	3.5E-21			Lead	1.6E-18	7.1E-20				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			7.7E-10
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate			5.0E-03		Tributyl phosphate			5.0E-03			
U-Total	1.7E-04	3.2E-07	3.0E-03	1.1E-04	U-Total	5.7E-05	2.5E-06	3.0E-03	8.2E-04	9.3E-04	9.3E-04
			Total Pathway:	1.1E-04				Total Pathway:	8.2E-04		
			Total Rad + Chem	1.1E-04				Total Rad + Chem	8.2E-04	*Total:* 9.3E-04	9.4E-04

TABLE B.3.2-14(a)

FUTURE, OFF-PROPERTY FARMER (Private Ownership)

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.97E-06	1.8E+01	2.8E-11	4.9E-10	CS-137	8.95E-06	9.3E+00	2.8E-11	2.6E-10	7.6E-10
NP-237	2.75E-06	5.4E+00	2.2E-10	1.2E-09	NP-237	2.75E-06	2.9E+00	2.2E-10	6.3E-10	1.8E-09
PU-238	1.48E-06	2.9E+00	2.2E-10	6.4E-10	PU-238	1.48E-06	1.5E+00	2.2E-10	3.4E-10	9.8E-10
PU-239/240	9.70E-07	1.9E+00	2.3E-10	4.4E-10	PU-239/240	9.70E-07	1.0E+00	2.3E-10	2.3E-10	6.7E-10
RA-226	4.04E-04	8.0E+02	7.8E-10	6.2E-07	RA-226	4.04E-04	4.2E+02	7.8E-10	3.3E-07	9.5E-07
RA-228	4.96E-05	9.8E+01	1.0E-10	9.8E-09	RA-228	4.91E-05	5.1E+01	1.0E-10	5.1E-09	1.5E-08
SR-90	2.28E-05	4.5E+01	3.6E-11	1.6E-09	SR-90	2.28E-05	2.4E+01	3.6E-11	8.6E-10	2.5E-09
TC-99	1.90E-03	3.7E+03	1.3E-12	4.9E-09	TC-99	1.90E-03	2.0E+03	1.3E-12	2.6E-09	7.4E-09
TH-228	5.62E-05	1.1E+02	5.5E-11	6.1E-09	TH-228	5.46E-05	5.7E+01	5.5E-11	3.1E-09	9.2E-09
TH-230	1.79E-04	3.5E+02	1.3E-11	4.6E-09	TH-230	1.79E-04	1.9E+02	1.3E-11	2.4E-09	7.0E-09
TH-232	5.20E-05	1.0E+02	1.7E-10	1.7E-08	TH-232	5.20E-05	5.4E+01	1.7E-10	9.2E-09	2.7E-08
U-234	1.10E-04	2.2E+02	1.6E-11	3.5E-09	U-234	1.10E-04	1.2E+02	1.6E-11	1.8E-09	5.3E-09
U-235/236	1.13E-05	2.2E+01	1.6E-11	3.6E-10	U-235/236	1.13E-05	1.2E+01	1.6E-11	1.9E-10	5.5E-10
U-238	1.19E-04	2.3E+02	2.8E-11	6.5E-09	U-238	1.19E-04	1.2E+02	2.8E-11	3.5E-09	1.0E-08
			Total Pathway:	6.8E-07				Total Pathway:	3.6E-07	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.29E-06	4.7E-09	7.7E+00	3.6E-08	Aroclor-1254	4.29E-06	2.5E-09	7.7E+00	1.9E-08	5.6E-08
Aroclor-1260	1.11E-06	1.2E-09	7.7E+00	9.4E-09	Aroclor-1260	1.11E-06	6.5E-10	7.7E+00	5.0E-09	1.4E-08
Arsenic	1.14E-04	1.3E-07	1.8E+00	2.2E-07	Arsenic	1.14E-04	6.6E-08	1.8E+00	1.2E-07	3.4E-07
Benzo(a)anthracene	7.53E-05	8.3E-08	7.3E-01	6.1E-08	Benzo(a)anthracene	7.48E-05	4.4E-08	7.3E-01	3.2E-08	9.2E-08
Benzo(a)pyrene	1.25E-04	1.4E-07	7.3E+00	1.0E-06	Benzo(a)pyrene	1.24E-04	7.2E-08	7.3E+00	5.3E-07	1.5E-06
Benzo(b)fluoranthen	8.15E-05	9.0E-08	7.3E-01	6.6E-08	Benzo(b)fluoranthene	8.09E-05	4.7E-08	7.3E-01	3.4E-08	1.0E-07
Benzo(g,h,i)perylene	7.94E-05	8.8E-08			Benzo(g,h,i)perylene	7.88E-05	4.6E-08			
Benzo(k)fluoranthen	9.75E-05	1.1E-07	7.3E-02	7.8E-09	Benzo(k)fluoranthene	9.73E-05	5.7E-08	7.3E-02	4.1E-09	1.2E-08
Beryllium	1.29E-05	1.4E-08	4.3E+00	6.1E-08	Beryllium	1.29E-05	7.5E-09	4.3E+00	3.2E-08	9.3E-08
Lead	3.27E-04	3.6E-07			Lead	3.27E-04	1.9E-07			
Dibenzo(a,h)anthrac	2.47E-05	2.7E-08	7.3E+00	2.0E-07	Dibenzo(a,h)anthracen	2.46E-05	1.4E-08	7.3E+00	1.0E-07	3.0E-07
Dieldrin	4.42E-07	4.9E-10	1.6E+01	7.8E-09	Dieldrin	4.42E-07	2.6E-10	1.6E+01	4.1E-09	1.2E-08
Indeno(1,2,3-cd)pyr	7.81E-05	8.6E-08	7.3E-01	6.3E-08	Indeno(1,2,3-cd)pyren	7.75E-05	4.5E-08	7.3E-01	3.3E-08	9.6E-08
Phenanthrene	3.11E-05	3.4E-08			Phenanthrene	3.03E-05	1.8E-08			
TH-Total	4.77E-04	5.3E-07			TH-Total	4.77E-04	2.8E-07			
			Total Pathway:	1.7E-06				Total Pathway:	9.1E-07	
			Total Rad + Chem	2.4E-06				Total Rad + Chem	1.3E-06	*Total:* 3.7E-06

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TABLE B.3.2-14(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	9.0E-06	1.8E+01			CS-137	8.95E-06	9.3E+00			
NP-237	2.7E-06	5.4E+00			NP-237	2.75E-06	2.9E+00			
PU-238	1.5E-06	2.9E+00			PU-238	1.48E-06	1.5E+00			
PU-239/240	9.7E-07	1.9E+00			PU-239/240	9.70E-07	1.0E+00			
RA-226	4.0E-04	8.0E+02			RA-226	4.04E-04	4.2E+02			
RA-228	5.0E-05	9.8E+01			RA-228	4.91E-05	5.1E+01			
SR-90	2.3E-05	4.5E+01			SR-90	2.28E-05	2.4E+01			
TC-99	1.9E-03	3.7E+03			TC-99	1.90E-03	2.0E+03			
TH-228	5.6E-05	1.1E+02			TH-228	5.46E-05	5.7E+01			
TH-230	1.8E-04	3.5E+02			TH-230	1.79E-04	1.9E+02			
TH-232	5.2E-05	1.0E+02			TH-232	5.20E-05	5.4E+01			
U-234	1.1E-04	2.2E+02			U-234	1.10E-04	1.2E+02			
U-235/236	1.1E-05	2.2E+01			U-235/236	1.13E-05	1.2E+01			
U-238	1.2E-04	2.3E+02			U-238	1.19E-04	1.2E+02			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.3E-06	4.7E-09			Aroclor-1254	4.29E-06	2.5E-09			
Aroclor-1260	1.1E-06	1.2E-09			Aroclor-1260	1.11E-06	6.5E-10			
Arsenic	1.1E-04	1.3E-07	3.0E-04	4.2E-04	Arsenic	1.14E-04	6.6E-08	3.0E-04	2.2E-04	6.4E-04
Benzo(a)anthracene	7.5E-05	8.3E-08			Benzo(a)anthracene	7.48E-05	4.4E-08			
Benzo(a)pyrene	1.2E-04	1.4E-07			Benzo(a)pyrene	1.24E-04	7.2E-08			
Benzo(b)fluoranthene	8.2E-05	9.0E-08			Benzo(b)fluoranthene	8.09E-05	4.7E-08			
Benzo(g,h,i)perylene	7.9E-05	8.8E-08			Benzo(g,h,i)perylene	7.88E-05	4.6E-08			
Benzo(k)fluoranthene	9.8E-05	1.1E-07			Benzo(k)fluoranthene	9.73E-05	5.7E-08			
Beryllium	1.3E-05	1.4E-08	5.0E-03	2.8E-06	Beryllium	1.29E-05	7.5E-09	5.0E-03	1.5E-06	4.3E-06
Lead	3.3E-04	3.6E-07			Lead	3.27E-04	1.9E-07			
Dibenzo(a,h)anthracen	2.5E-05	2.7E-08			Dibenzo(a,h)anthracen	2.46E-05	1.4E-08			
Dieldrin	4.4E-07	4.9E-10	5.0E-05	9.7E-06	Dieldrin	4.42E-07	2.6E-10	5.0E-05	5.2E-06	1.5E-05
Indeno(1,2,3-cd)pyren	7.8E-05	8.6E-08			Indeno(1,2,3-cd)pyren	7.75E-05	4.5E-08			
Phenanthrene	3.1E-05	3.4E-08			Phenanthrene	3.03E-05	1.8E-08			
TH-Total	4.8E-04	5.3E-07			TH-Total	4.77E-04	2.8E-07			
			Total Pathway:	4.3E-04				Total Pathway:	2.3E-04	
			Total Rad + Chem	4.3E-04				Total Rad + Chem	2.3E-04	*Total:* 6.6E-04

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TABLE B.3.2-14(a)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.39E-06	2.7E+00	2.2E-10	6.0E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	1.27E-05	2.5E+01	3.6E-11	9.0E-10
TC-99	5.12E-03	1.0E+04	1.3E-12	1.3E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	2.3E+05	1.6E-11	3.7E-06
U-235/236	6.27E-03	1.2E+04	1.6E-11	2.0E-07
U-238	1.30E-01	2.6E+05	2.8E-11	7.2E-06
			Total Pathway:	1.1E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	1.39E-06	1.5E+00	2.2E-10	3.2E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	1.27E-05	1.3E+01	3.6E-11	4.8E-10
TC-99	5.12E-03	5.3E+03	1.3E-12	6.9E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	1.2E+05	1.6E-11	2.0E-06
U-235/236	6.27E-03	6.5E+03	1.6E-11	1.0E-07
U-238	1.30E-01	1.4E+05	2.8E-11	3.8E-06
			Total Pathway:	5.9E-06

Total	Total Dust & Groundwater Affected
	7.6E-10
9.2E-10	2.7E-09
	9.8E-10
	6.7E-10
	9.5E-07
	1.5E-08
1.4E-09	3.9E-09
2.0E-08	2.8E-08
	9.2E-09
	7.0E-09
	2.7E-08
5.7E-06	5.7E-06
3.0E-07	3.0E-07
1.1E-05	1.1E-05

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02	
Beryllium			4.3E+00	
Lead	1.06E-16	1.2E-19		
Dibenzo(a,h)anthrac			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyr			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	4.62E-01	5.1E-04		
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	1.06E-16	6.2E-20		
Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyren			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	4.62E-01	2.7E-04		
			Total Pathway:	

Total	Total Dust & Groundwater Affected
	5.6E-08
	1.4E-08
	3.4E-07
	9.2E-08
	1.5E-06
	1.0E-07
	1.2E-08
	9.3E-08
	3.0E-07
	1.2E-08
	9.6E-08

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Total Rad + Chem 1.1E-05

Total Rad + Chem 5.9E-06

Total: 1.7E-05 2.1E-05

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TABLE B.3.2-14(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.4E-06	2.7E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.3E-05	2.5E+01		
TC-99	5.1E-03	1.0E+04		
TH-228				
TH-230				
TH-232				
U-234	1.2E-01	2.3E+05		
U-235/236	6.3E-03	1.2E+04		
U-238	1.3E-01	2.6E+05		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.39E-06	1.5E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.27E-05	1.3E+01		
TC-99	5.12E-03	5.3E+03		
TH-228				
TH-230				
TH-232				
U-234	1.18E-01	1.2E+05		
U-235/236	6.27E-03	6.5E+03		
U-238	1.30E-01	1.4E+05		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.1E-16	1.2E-19		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.6E-01	5.1E-04	3.0E-03	1.7E-01

Total Pathway: 1.7E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.06E-16	6.2E-20		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.62E-01	2.7E-04	3.0E-03	9.0E-02

Total Pathway: 9.0E-02

	Total	Total Dust & Groundwater Affected
		6.4E-04
		4.3E-06
		1.5E-05
		1.5E-05
	2.6E-01	2.6E-01

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Total Rad + Chem 1.7E-01

Total Rad + Chem 9.0E-02 *Total:* 2.6E-01 2.6E-01

TABLE B.3.2-14(b)

FUTURE, OFF-PROPERTY CHILD (Private Ownership)

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.97E-06	7.5E-01	2.8E-11	2.1E-11	CS-137	8.95E-06	1.2E+00	2.8E-11	3.2E-11	5.3E-11
NP-237	2.75E-06	2.3E-01	2.2E-10	5.1E-11	NP-237	2.75E-06	3.5E-01	2.2E-10	7.8E-11	1.3E-10
PU-238	1.48E-06	1.2E-01	2.2E-10	2.7E-11	PU-238	1.48E-06	1.9E-01	2.2E-10	4.2E-11	6.9E-11
PU-239/240	9.70E-07	8.1E-02	2.3E-10	1.9E-11	PU-239/240	9.70E-07	1.2E-01	2.3E-10	2.9E-11	4.7E-11
RA-226	4.04E-04	3.4E+01	7.8E-10	2.6E-08	RA-226	4.04E-04	5.2E+01	7.8E-10	4.0E-08	6.7E-08
RA-228	4.96E-05	4.2E+00	1.0E-10	4.2E-10	RA-228	4.91E-05	6.3E+00	1.0E-10	6.3E-10	1.0E-09
SR-90	2.28E-05	1.9E+00	3.6E-11	6.9E-11	SR-90	2.28E-05	2.9E+00	3.6E-11	1.1E-10	1.7E-10
TC-99	1.90E-03	1.6E+02	1.3E-12	2.1E-10	TC-99	1.90E-03	2.4E+02	1.3E-12	3.2E-10	5.3E-10
TH-228	5.62E-05	4.7E+00	5.5E-11	2.6E-10	TH-228	5.46E-05	7.0E+00	5.5E-11	3.9E-10	6.5E-10
TH-230	1.79E-04	1.5E+01	1.3E-11	2.0E-10	TH-230	1.79E-04	2.3E+01	1.3E-11	3.0E-10	5.0E-10
TH-232	5.20E-05	4.4E+00	1.7E-10	7.4E-10	TH-232	5.20E-05	6.7E+00	1.7E-10	1.1E-09	1.9E-09
U-234	1.10E-04	9.3E+00	1.6E-11	1.5E-10	U-234	1.10E-04	1.4E+01	1.6E-11	2.3E-10	3.7E-10
U-235/236	1.13E-05	9.5E-01	1.6E-11	1.5E-11	U-235/236	1.13E-05	1.5E+00	1.6E-11	2.3E-11	3.8E-11
U-238	1.19E-04	1.0E+01	2.8E-11	2.8E-10	U-238	1.19E-04	1.5E+01	2.8E-11	4.3E-10	7.1E-10
			Total Pathway:	2.9E-08				Total Pathway:	4.4E-08	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.29E-06	9.4E-10	7.7E+00	7.2E-09	Aroclor-1254	4.29E-06	1.4E-09	7.7E+00	1.1E-08	1.8E-08
Aroclor-1260	1.11E-06	2.4E-10	7.7E+00	1.9E-09	Aroclor-1260	1.11E-06	3.7E-10	7.7E+00	2.9E-09	4.7E-09
Arsenic	1.14E-04	2.5E-08	1.8E+00	4.4E-08	Arsenic	1.14E-04	3.8E-08	1.8E+00	6.7E-08	1.1E-07
Benzo(a)anthracene	7.53E-05	1.7E-08	7.3E-01	1.2E-08	Benzo(a)anthracene	7.48E-05	2.5E-08	7.3E-01	1.8E-08	3.0E-08
Benzo(a)pyrene	1.25E-04	2.7E-08	7.3E+00	2.0E-07	Benzo(a)pyrene	1.24E-04	4.1E-08	7.3E+00	3.0E-07	5.0E-07
Benzo(b)fluoranthen	8.15E-05	1.8E-08	7.3E-01	1.3E-08	Benzo(b)fluoranthene	8.09E-05	2.7E-08	7.3E-01	2.0E-08	3.3E-08
Benzo(g,h,i)perylene	7.94E-05	1.7E-08			Benzo(g,h,i)perylene	7.88E-05	2.6E-08			
Benzo(k)fluoranthen	9.75E-05	2.1E-08	7.3E-02	1.6E-09	Benzo(k)fluoranthene	9.73E-05	3.3E-08	7.3E-02	2.4E-09	3.9E-09
Beryllium	1.29E-05	2.8E-09	4.3E+00	1.2E-08	Beryllium	1.29E-05	4.3E-09	4.3E+00	1.9E-08	3.1E-08
Lead	3.27E-04	7.2E-08			Lead	3.27E-04	1.1E-07			
Dibenzo(a,h)anthrac	2.47E-05	5.4E-09	7.3E+00	3.9E-08	Dibenzo(a,h)anthracen	2.46E-05	8.2E-09	7.3E+00	6.0E-08	1.0E-07
Dieldrin	4.42E-07	9.7E-11	1.6E+01	1.6E-09	Dieldrin	4.42E-07	1.5E-10	1.6E+01	2.4E-09	3.9E-09
Indeno(1,2,3-cd)pyr	7.81E-05	1.7E-08	7.3E-01	1.2E-08	Indeno(1,2,3-cd)pyren	7.75E-05	2.6E-08	7.3E-01	1.9E-08	3.1E-08
Phenanthrene	3.11E-05	6.8E-09			Phenanthrene	3.03E-05	1.0E-08			
TH-Total	4.77E-04	1.0E-07			TH-Total	4.77E-04	1.6E-07			
			Total Pathway:	3.4E-07				Total Pathway:	5.2E-07	
			Total Rad + Chem	3.7E-07				Total Rad + Chem	5.7E-07	*Total:* 9.4E-07

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TABLE B.3.2-14(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	9.0E-06	7.5E-01		
NP-237	2.7E-06	2.3E-01		
PU-238	1.5E-06	1.2E-01		
PU-239/240	9.7E-07	8.1E-02		
RA-226	4.0E-04	3.4E+01		
RA-228	5.0E-05	4.2E+00		
SR-90	2.3E-05	1.9E+00		
TC-99	1.9E-03	1.6E+02		
TH-228	5.6E-05	4.7E+00		
TH-230	1.8E-04	1.5E+01		
TH-232	5.2E-05	4.4E+00		
U-234	1.1E-04	9.3E+00		
U-235/236	1.1E-05	9.5E-01		
U-238	1.2E-04	1.0E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	8.95E-06	1.2E+00		
NP-237	2.75E-06	3.5E-01		
PU-238	1.48E-06	1.9E-01		
PU-239/240	9.70E-07	1.2E-01		
RA-226	4.04E-04	5.2E+01		
RA-228	4.91E-05	6.3E+00		
SR-90	2.28E-05	2.9E+00		
TC-99	1.90E-03	2.4E+02		
TH-228	5.46E-05	7.0E+00		
TH-230	1.79E-04	2.3E+01		
TH-232	5.20E-05	6.7E+00		
U-234	1.10E-04	1.4E+01		
U-235/236	1.13E-05	1.5E+00		
U-238	1.19E-04	1.5E+01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	4.3E-06	1.1E-08		
Aroclor-1260	1.1E-06	2.8E-09		
Arsenic	1.1E-04	2.9E-07	3.0E-04	9.7E-04
Benzo(a)anthracene	7.5E-05	1.9E-07		
Benzo(a)pyrene	1.2E-04	3.2E-07		
Benzo(b)fluoranthene	8.2E-05	2.1E-07		
Benzo(g,h,i)perylene	7.9E-05	2.0E-07		
Benzo(k)fluoranthene	9.8E-05	2.5E-07		
Beryllium	1.3E-05	3.3E-08	5.0E-03	6.6E-06
Lead	3.3E-04	8.4E-07		
Dibenzo(a,h)anthracen	2.5E-05	6.3E-08		
Dieldrin	4.4E-07	1.1E-09	5.0E-05	2.3E-05
Indeno(1,2,3-cd)pyren	7.8E-05	2.0E-07		
Phenanthrene	3.1E-05	7.9E-08		
TH-Total	4.8E-04	1.2E-06		

Total Pathway: 1.0E-03

Total Rad + Chem 1.0E-03

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	4.29E-06	1.7E-08		
Aroclor-1260	1.11E-06	4.3E-09		
Arsenic	1.14E-04	4.5E-07	3.0E-04	1.5E-03
Benzo(a)anthracene	7.48E-05	2.9E-07		
Benzo(a)pyrene	1.24E-04	4.8E-07		
Benzo(b)fluoranthene	8.09E-05	3.2E-07		
Benzo(g,h,i)perylene	7.88E-05	3.1E-07		
Benzo(k)fluoranthene	9.73E-05	3.8E-07		
Beryllium	1.29E-05	5.0E-08	5.0E-03	1.0E-05
Lead	3.27E-04	1.3E-06		
Dibenzo(a,h)anthracen	2.46E-05	9.6E-08		
Dieldrin	4.42E-07	1.7E-09	5.0E-05	3.5E-05
Indeno(1,2,3-cd)pyren	7.75E-05	3.0E-07		
Phenanthrene	3.03E-05	1.2E-07		
TH-Total	4.77E-04	1.9E-06		

Total Pathway: 1.5E-03

Total Rad + Chem 1.5E-03

Total	
	2.5E-03
	1.7E-05
	5.7E-05
Total:	2.5E-03

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TABLE B.3.2-14(b)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			5.3E-11
NP-237	1.39E-06	1.2E-01	2.2E-10	2.6E-11	NP-237	1.39E-06	1.8E-01	2.2E-10	3.9E-11	6.5E-11	1.9E-10
PU-238			2.2E-10		PU-238			2.2E-10			6.9E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			4.7E-11
RA-226			7.8E-10		RA-226			7.8E-10			6.7E-08
RA-228			1.0E-10		RA-228			1.0E-10			1.0E-09
SR-90	1.27E-05	1.1E+00	3.6E-11	3.9E-11	SR-90	1.27E-05	1.6E+00	3.6E-11	5.9E-11	9.7E-11	2.7E-10
TC-99	5.12E-03	4.3E+02	1.3E-12	5.6E-10	TC-99	5.12E-03	6.6E+02	1.3E-12	8.6E-10	1.4E-09	1.9E-09
TH-228			5.5E-11		TH-228			5.5E-11			6.5E-10
TH-230			1.3E-11		TH-230			1.3E-11			5.0E-10
TH-232			1.7E-10		TH-232			1.7E-10			1.9E-09
U-234	1.18E-01	9.9E+03	1.6E-11	1.6E-07	U-234	1.18E-01	1.5E+04	1.6E-11	2.4E-07	4.0E-07	4.0E-07
U-235/236	6.27E-03	5.3E+02	1.6E-11	8.4E-09	U-235/236	6.27E-03	8.1E+02	1.6E-11	1.3E-08	2.1E-08	2.1E-08
U-238	1.30E-01	1.1E+04	2.8E-11	3.1E-07	U-238	1.30E-01	1.7E+04	2.8E-11	4.7E-07	7.7E-07	7.7E-07
		Total Pathway:		4.7E-07			Total Pathway:		7.2E-07		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		1.8E-08
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00		4.7E-09
Arsenic			1.8E+00		Arsenic			1.8E+00		1.1E-07
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		3.0E-08
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		5.0E-07
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01		3.3E-08
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Benzo(k)fluoranthen			7.3E-02		Benzo(k)fluoranthene			7.3E-02		3.9E-09
Beryllium			4.3E+00		Beryllium			4.3E+00		3.1E-08
Lead	1.06E-16	2.3E-20			Lead	1.06E-16	3.6E-20			
Dibenzo(a,h)anthrac			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00		1.0E-07
Dieldrin			1.6E+01		Dieldrin			1.6E+01		3.9E-09
Indeno(1,2,3-cd)pyr			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01		3.1E-08
Phenanthrene					Phenanthrene					
TH-Total					TH-Total					
2-Methylnaphthalene					2-Methylnaphthalene					
Tributyl phosphate					Tributyl phosphate					
U-Total	4.62E-01	1.0E-04			U-Total	4.62E-01	1.6E-04			
		Total Pathway:					Total Pathway:			

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Total Rad + Chem 4.7E-07

Total Rad + Chem 7.2E-07

Total: 1.2E-06 2.1E-06

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TABLE B.3.2-14(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.4E-06	1.2E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.3E-05	1.1E+00		
TC-99	5.1E-03	4.3E+02		
TH-228				
TH-230				
TH-232				
U-234	1.2E-01	9.9E+03		
U-235/236	6.3E-03	5.3E+02		
U-238	1.3E-01			

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.39E-06	1.8E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.27E-05	1.6E+00		
TC-99	5.12E-03	6.6E+02		
TH-228				
TH-230				
TH-232				
U-234	1.18E-01	1.5E+04		
U-235/236	6.27E-03	8.1E+02		
U-238	1.30E-01	1.7E+04		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.1E-16	2.7E-19		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.6E-01	1.2E-03	3.0E-03	3.9E-01

Total Pathway: 3.9E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.06E-16	4.1E-19		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.62E-01	1.8E-03	3.0E-03	6.0E-01

Total Pathway: 6.0E-01

Total	Total Dust & Groundwater Affected
	2.5E-03
	1.7E-05
	5.7E-05
	5.7E-05
1.0E+00	1.0E+00

Total Rad + Chem 3.9E-01

Total Rad + Chem 6.0E-01

Total: 1.0E+00 1.0E+00

TABLE B.3.2-14 (c)

FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/g)	Intake	SF(o)	Risk	
CS-137	2.52E-07	5.0E-01	2.8E-11	1.4E-11	CS-137	2.10E-07	2.2E-01	2.8E-11	6.1E-12	2.0E-11
NP-237	7.76E-08	1.5E-01	2.2E-10	3.4E-11	NP-237	7.71E-08	8.1E-02	2.2E-10	1.8E-11	5.1E-11
PU-238	4.16E-08	8.2E-02	2.2E-10	1.8E-11	PU-238	4.15E-08	4.3E-02	2.2E-10	9.5E-12	2.8E-11
PU-239/240	2.72E-08	5.4E-02	2.3E-10	1.2E-11	PU-239/240	2.72E-08	2.8E-02	2.3E-10	6.5E-12	1.9E-11
RA-226	1.13E-05	2.2E+01	7.8E-10		RA-226	1.11E-05	1.2E+01	7.8E-10	9.1E-09	9.1E-09
RA-228	1.39E-06	2.7E+00	1.0E-10	2.7E-10	RA-228	1.38E-06	1.4E+00	1.0E-10	1.4E-10	4.2E-10
SR-90	6.42E-07	1.3E+00	3.6E-11	4.6E-11	SR-90	6.01E-07	6.3E-01	3.6E-11	2.3E-11	6.8E-11
TC-99	5.36E-05	1.1E+02	1.3E-12	1.4E-10	TC-99	5.20E-05	5.4E+01	1.3E-12	7.1E-11	2.1E-10
TH-228	1.58E-06	3.1E+00	5.5E-11	1.7E-10	TH-228	1.53E-06	1.6E+00	5.5E-11	8.8E-11	2.6E-10
TH-230	5.05E-06	9.9E+00	1.3E-11	1.3E-10	TH-230	4.99E-06	5.2E+00	1.3E-11	6.8E-11	2.0E-10
TH-232	1.46E-06	2.9E+00	1.7E-10	4.9E-10	TH-232	1.44E-06	1.5E+00	1.7E-10	2.6E-10	7.4E-10
U-234	3.10E-06	6.1E+00	1.6E-11	9.8E-11	U-234	3.10E-06	3.2E+00	1.6E-11	5.2E-11	1.5E-10
U-235/236	3.18E-07	6.3E-01	1.6E-11	1.0E-11	U-235/236	3.18E-07	3.3E-01	1.6E-11	5.3E-12	1.5E-11
U-238	3.34E-06	6.6E+00	2.8E-11	1.8E-10	U-238	3.33E-06	3.5E+00	2.8E-11	9.7E-11	2.8E-10
			Total Pathway:	1.6E-09				Total Pathway:	9.9E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.21E-07	1.3E-10	7.7E+00	1.0E-09	Aroclor-1254	6.99E-08	4.1E-11	7.7E+00	3.1E-10	1.3E-09
Aroclor-1260	3.11E-08	3.4E-11	7.7E+00	2.6E-10	Aroclor-1260	2.40E-08	1.4E-11	7.7E+00	1.1E-10	3.7E-10
Arsenic	3.21E-06	3.5E-09	1.8E+00	6.2E-09	Arsenic	2.86E-06	1.7E-09	1.8E+00	2.9E-09	9.1E-09
Benzo(a)anthracene	2.12E-06	2.3E-09	7.3E-01	1.7E-09	Benzo(a)anthracene	2.02E-06	1.2E-09	7.3E-01	8.6E-10	2.6E-09
Benzo(a)pyrene	3.51E-06	3.9E-09	7.3E+00	2.8E-08	Benzo(a)pyrene	3.40E-06	2.0E-09	7.3E+00	1.5E-08	4.3E-08
Benzo(b)fluoranthene	2.30E-06	2.5E-09	7.3E-01	1.8E-09	Benzo(b)fluoranthene	2.24E-06	1.3E-09	7.3E-01	9.5E-10	2.8E-09
Benzo(g,h,i)perylene	2.24E-06	2.5E-09			Benzo(g,h,i)perylene	2.21E-06	1.3E-09			
Benzo(k)fluoranthene	2.74E-06	3.0E-09	7.3E-02	2.2E-10	Benzo(k)fluoranthene	2.66E-06	1.6E-09	7.3E-02	1.1E-10	3.3E-10
Beryllium	3.62E-07	4.0E-10	4.3E+00	1.7E-09	Beryllium	3.48E-07	2.0E-10	4.3E+00	8.7E-10	2.6E-09
Lead	9.20E-06	1.0E-08			Lead	8.98E-06	5.2E-09			
Dibenzo(a,h)anthrace	6.95E-07	7.6E-10	7.3E+00	5.6E-09	Dibenzo(a,h)anthrace	6.83E-07	4.0E-10	7.3E+00	2.9E-09	8.5E-09
Dieldrin	1.24E-08	1.4E-11	1.6E+01	2.2E-10	Dieldrin	7.38E-09	4.3E-12	1.6E+01	6.9E-11	2.9E-10
Indeno(1,2,3-cd)pyre	2.20E-06	2.4E-09	7.3E-01	1.8E-09	Indeno(1,2,3-cd)pyre	2.15E-06	1.3E-09	7.3E-01	9.2E-10	2.7E-09
Phenanthrene	8.73E-07	9.6E-10			Phenanthrene	8.23E-07	4.8E-10			
TH-Total	1.34E-05	1.5E-08			TH-Total	1.33E-05	7.8E-09			
			Total Pathway:	4.9E-08				Total Pathway:	2.5E-08	
			Total Rad + Chem	5.0E-08				Total Rad + Chem	3.4E-08	*Total:* 8.5E-08

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TABLE B.3.2-14 (c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/g)	Intake	RfD(o)	Hazard	
CS-137	2.5E-07				CS-137	2.10E-07				
NP-237	7.8E-08				NP-237	7.71E-08				
PU-238	4.2E-08				PU-238	4.15E-08				
PU-239/240	2.7E-08				PU-239/240	2.72E-08				
					RA-226	1.11E-05				
RA-228	1.4E-06				RA-228	1.38E-06				
SR-90	6.4E-07				SR-90	6.01E-07				
TC-99	5.4E-05				TC-99	5.20E-05				
TH-228	1.6E-06				TH-228	1.53E-06				
TH-230	5.0E-06				TH-230	4.99E-06				
TH-232	1.5E-06				TH-232	1.44E-06				
U-234	3.1E-06				U-234	3.10E-06				
U-235/236	3.2E-07				U-235/236	3.18E-07				
U-238	3.3E-06				U-238	3.33E-06				
		Total Pathway:		0.0E+00			Total Pathway:		0.0E+00	

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.2E-07	1.3E-10			Aroclor-1254	6.99E-08	4.1E-11			
Aroclor-1260	3.1E-08	3.4E-11			Aroclor-1260	2.40E-08	1.4E-11			
Arsenic	3.2E-06	3.5E-09	3.0E-04	1.2E-05	Arsenic	2.86E-06	1.7E-09	3.0E-04	5.6E-06	1.7E-05
Benzo(a)anthracene	2.1E-06	2.3E-09			Benzo(a)anthracene	2.02E-06	1.2E-09			
Benzo(a)pyrene	3.5E-06	3.9E-09			Benzo(a)pyrene	3.40E-06	2.0E-09			
Benzo(b)fluoranthene	2.3E-06	2.5E-09			Benzo(b)fluoranthene	2.24E-06	1.3E-09			
Benzo(g,h,i)perylene	2.2E-06	2.5E-09			Benzo(g,h,i)perylene	2.21E-06	1.3E-09			
Benzo(k)fluoranthene	2.7E-06	3.0E-09			Benzo(k)fluoranthene	2.66E-06	1.6E-09			
Beryllium	3.6E-07	4.0E-10	5.0E-03	8.0E-08	Beryllium	3.48E-07	2.0E-10	5.0E-03	1.0E-12	8.0E-08
Lead	9.2E-06	1.0E-08			Lead	8.98E-06	5.2E-09			
Dibenzo(a,h)anthrace	6.9E-07	7.6E-10			Dibenzo(a,h)anthrace	6.83E-07	4.0E-10			
Dieldrin	1.2E-08	1.4E-11	5.0E-05	2.7E-07	Dieldrin	7.38E-09	4.3E-12	5.0E-05	2.2E-16	2.7E-07
Indeno(1,2,3-cd)pyre	2.2E-06	2.4E-09			Indeno(1,2,3-cd)pyre	2.15E-06	1.3E-09			
Phenanthrene	8.7E-07	9.6E-10			Phenanthrene	8.23E-07	4.8E-10			
TH-Total	1.3E-05	1.5E-08			TH-Total	1.33E-05	7.8E-09			
			Total Pathway:	1.2E-05				Total Pathway:	5.6E-06	
			Total Rad + Chem	1.2E-05				Total Rad + Chem	5.6E-06	*Total:* 1.8E-05

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TABLE B.3.2-14 (c)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			2.0E-11
NP-237	1.39E-06	2.7E+00	2.2E-10	6.0E-10	NP-237	1.39E-06	1.5E+00	2.2E-10	3.2E-10	9.2E-10	9.7E-10
PU-238			2.2E-10		PU-238			2.2E-10			2.8E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.9E-11
RA-226			7.8E-10		RA-226			7.8E-10			9.1E-09
RA-228			1.0E-10		RA-228			1.0E-10			4.2E-10
SR-90	1.27E-05	2.5E+01	3.6E-11	9.0E-10	SR-90	1.27E-05	1.3E+01	3.6E-11	4.8E-10	1.4E-09	1.4E-09
TC-99	5.12E-03	1.0E+04	1.3E-12	1.3E-08	TC-99	5.12E-03	5.3E+03	1.3E-12	6.9E-09	2.0E-08	2.0E-08
TH-228			5.5E-11		TH-228			5.5E-11			2.6E-10
TH-230			1.3E-11		TH-230			1.3E-11			2.0E-10
TH-232			1.7E-10		TH-232			1.7E-10			7.4E-10
U-234	1.18E-01	2.3E+05	1.6E-11	3.7E-06	U-234	1.18E-01	1.2E+05	1.6E-11	2.0E-06	5.7E-06	5.7E-06
U-235/236	6.27E-03	1.2E+04	1.6E-11	2.0E-07	U-235/236	6.27E-03	6.5E+03	1.6E-11	1.0E-07	3.0E-07	3.0E-07
U-238	1.30E-01	2.6E+05	2.8E-11	7.2E-06	U-238	1.30E-01	1.4E+05	2.8E-11	3.8E-06	1.1E-05	1.1E-05
			Total Pathway:	1.1E-05				Total Pathway:	5.9E-06		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit				
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00	
Arsenic			1.8E+00		Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02		Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00		Beryllium			4.3E+00	
Lead	1.06E-16	1.2E-19			Lead	1.06E-16	6.2E-20		
Dibenzo(a,h)anthrac			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01		Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyr			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01	
Phenanthrene					Phenanthrene				
TH-Total					TH-Total				
2-Methylnaphthalene					2-Methylnaphthalene				
Tributyl phosphate					Tributyl phosphate				
U-Total	4.62E-01	5.1E-04			U-Total	4.62E-01	2.7E-04		
			Total Pathway:					Total Pathway:	

FER\CRU2RI\ABQ\SVGOFFPW.XLS\6/5/94; 7:25 PM	Total Rad + Chem	1.1E-05	Total Rad + Chem	5.9E-06	*Total:*	1.7E-05	1.7E-05

TABLE B.3.2-14 (c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.4E-06	2.7E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.3E-05	2.5E+01		
TC-99	5.1E-03	1.0E+04		
TH-228				
TH-230				
TH-232				
U-234	1.2E-01	2.3E+05		
U-235/236	6.3E-03	1.2E+04		
U-238	1.3E-01	2.6E+05		
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.39E-06	1.5E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.27E-05	1.3E+01		
TC-99	5.12E-03	5.3E+03		
TH-228				
TH-230				
TH-232				
U-234	1.18E-01	1.2E+05		
U-235/236	6.27E-03	6.5E+03		
U-238	1.30E-01	1.4E+05		
			Total Pathway:	

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.1E-16	1.2E-19		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.6E-01	5.1E-04	3.0E-03	1.7E-01
			Total Pathway:	1.7E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.06E-16	6.2E-20		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.62E-01	2.7E-04	3.0E-03	9.0E-02
			Total Pathway:	9.0E-02

	Total	Total Dust & Groundwater Affected
	2.6E-01	2.6E-01

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Total Rad + Chem 1.7E-01

Total Rad + Chem 9.0E-02 *Total:* 2.6E-01 2.6E-01

TABLE B.3.2-14 (d)

FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/g)	Intake	SF(o)	Risk	
CS-137	2.52E-07	2.1E-02	2.8E-11	5.9E-13	CS-137	2.10E-07	2.7E-02	2.8E-11	7.5E-13	1.3E-12
NP-237	7.76E-08	6.5E-03	2.2E-10	1.4E-12	NP-237	7.71E-08	9.9E-03	2.2E-10	2.2E-12	3.6E-12
PU-238	4.16E-08	3.5E-03	2.2E-10	7.7E-13	PU-238	4.15E-08	5.3E-03	2.2E-10	1.2E-12	1.9E-12
PU-239/240	2.72E-08	2.3E-03	2.3E-10	5.3E-13	PU-239/240	2.72E-08	3.5E-03	2.3E-10	8.0E-13	1.3E-12
RA-226	1.13E-05	9.5E-01	7.8E-10		RA-226	1.11E-05	1.4E+00	7.8E-10	1.1E-09	1.1E-09
RA-228	1.39E-06	1.2E-01	1.0E-10	1.2E-11	RA-228	1.38E-06	1.8E-01	1.0E-10	1.8E-11	2.9E-11
SR-90	6.42E-07	5.4E-02	3.6E-11	1.9E-12	SR-90	6.01E-07	7.7E-02	3.6E-11	2.8E-12	4.7E-12
TC-99	5.36E-05	4.5E+00	1.3E-12	5.9E-12	TC-99	5.20E-05	6.7E+00	1.3E-12	8.7E-12	1.5E-11
TH-228	1.58E-06	1.3E-01	5.5E-11	7.3E-12	TH-228	1.53E-06	2.0E-01	5.5E-11	1.1E-11	1.8E-11
TH-230	5.05E-06	4.2E-01	1.3E-11	5.5E-12	TH-230	4.99E-06	6.4E-01	1.3E-11	8.3E-12	1.4E-11
TH-232	1.46E-06	1.2E-01	1.7E-10	2.1E-11	TH-232	1.44E-06	1.9E-01	1.7E-10	3.2E-11	5.2E-11
U-234	3.10E-06	2.6E-01	1.6E-11	4.2E-12	U-234	3.10E-06	4.0E-01	1.6E-11	6.4E-12	1.1E-11
U-235/236	3.18E-07	2.7E-02	1.6E-11	4.3E-13	U-235/236	3.18E-07	4.1E-02	1.6E-11	6.5E-13	1.1E-12
U-238	3.34E-06	2.8E-01	2.8E-11	7.8E-12	U-238	3.33E-06	4.3E-01	2.8E-11	1.2E-11	2.0E-11
			Total Pathway:	6.9E-11				Total Pathway:	1.2E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.21E-07	2.6E-11	7.7E+00	2.0E-10	Aroclor-1254	6.99E-08	2.3E-11	7.7E+00	1.8E-10	3.8E-10
Aroclor-1260	3.11E-08	6.8E-12	7.7E+00	5.3E-11	Aroclor-1260	2.40E-08	8.0E-12	7.7E+00	6.2E-11	1.1E-10
Arsenic	3.21E-06	7.0E-10	1.8E+00	1.2E-09	Arsenic	2.86E-06	9.6E-10	1.8E+00	1.7E-09	2.9E-09
Benzo(a)anthracene	2.12E-06	4.6E-10	7.3E-01	3.4E-10	Benzo(a)anthracene	2.02E-06	6.8E-10	7.3E-01	4.9E-10	8.3E-10
Benzo(a)pyrene	3.51E-06	7.7E-10	7.3E+00	5.6E-09	Benzo(a)pyrene	3.40E-06	1.1E-09	7.3E+00	8.3E-09	1.4E-08
Benzo(b)fluoranthene	2.30E-06	5.0E-10	7.3E-01	3.7E-10	Benzo(b)fluoranthene	2.24E-06	7.5E-10	7.3E-01	5.5E-10	9.2E-10
Benzo(g,h,i)perylene	2.24E-06	4.9E-10			Benzo(g,h,i)perylene	2.21E-06	7.4E-10			
Benzo(k)fluoranthene	2.74E-06	6.0E-10	7.3E-02	4.4E-11	Benzo(k)fluoranthene	2.66E-06	8.9E-10	7.3E-02	6.5E-11	1.1E-10
Beryllium	3.62E-07	7.9E-11	4.3E+00	3.4E-10	Beryllium	3.48E-07	1.2E-10	4.3E+00	5.0E-10	8.4E-10
Lead	9.20E-06	2.0E-09			Lead	8.98E-06	3.0E-09			
Dibenzo(a,h)anthrace	6.95E-07	1.5E-10	7.3E+00	1.1E-09	Dibenzo(a,h)anthrace	6.83E-07	2.3E-10	7.3E+00	1.7E-09	2.8E-09
Dieldrin	1.24E-08	2.7E-12	1.6E+01	4.4E-11	Dieldrin	7.38E-09	2.5E-12	1.6E+01	4.0E-11	8.3E-11
Indeno(1,2,3-cd)pyre	2.20E-06	4.8E-10	7.3E-01	3.5E-10	Indeno(1,2,3-cd)pyre	2.15E-06	7.2E-10	7.3E-01	5.3E-10	8.8E-10
Phenanthrene	8.73E-07	1.9E-10			Phenanthrene	8.23E-07	2.8E-10			
TH-Total	1.34E-05	2.9E-09			TH-Total	1.33E-05	4.5E-09			
			Total Pathway:	9.7E-09				Total Pathway:	1.4E-08	
			Total Rad + Chem	9.8E-09				Total Rad + Chem	1.5E-08	*Total:* 2.5E-08

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TABLE B.3.2-14 (d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/g)	Intake	RfD(o)	Hazard	
CS-137	2.5E-07				CS-137	2.10E-07				
NP-237	7.8E-08				NP-237	7.71E-08				
PU-238	4.2E-08				PU-238	4.15E-08				
PU-239/240	2.7E-08				PU-239/240	2.72E-08				
					RA-226	1.11E-05				
RA-228	1.4E-06				RA-228	1.38E-06				
SR-90	6.4E-07				SR-90	6.01E-07				
TC-99	5.4E-05				TC-99	5.20E-05				
TH-228	1.6E-06				TH-228	1.53E-06				
TH-230	5.0E-06				TH-230	4.99E-06				
TH-232	1.5E-06				TH-232	1.44E-06				
U-234	3.1E-06				U-234	3.10E-06				
U-235/236	3.2E-07				U-235/236	3.18E-07				
U-238	3.3E-06				U-238	3.33E-06				
		Total Pathway:		0.0E+00				Total Pathway:		0.0E+00

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.2E-07	3.1E-10			Aroclor-1254	6.99E-08	2.7E-10			
Aroclor-1260	3.1E-08	8.0E-11			Aroclor-1260	2.40E-08	9.4E-11			
Arsenic	3.2E-06	8.2E-09	3.0E-04	2.7E-05	Arsenic	2.86E-06	1.1E-08	3.0E-04	3.7E-05	6.5E-05
Benzo(a)anthracene	2.1E-06	5.4E-09			Benzo(a)anthracene	2.02E-06	7.9E-09			
Benzo(a)pyrene	3.5E-06	9.0E-09			Benzo(a)pyrene	3.40E-06	1.3E-08			
Benzo(b)fluoranthene	2.3E-06	5.9E-09			Benzo(b)fluoranthene	2.24E-06	8.7E-09			
Benzo(g,h,i)perylene	2.2E-06	5.7E-09			Benzo(g,h,i)perylene	2.21E-06	8.7E-09			
Benzo(k)fluoranthene	2.7E-06	7.0E-09			Benzo(k)fluoranthene	2.66E-06	1.0E-08			
Beryllium	3.6E-07	9.2E-10	5.0E-03	1.8E-07	Beryllium	3.48E-07	1.4E-09	5.0E-03	6.8E-12	1.8E-07
Lead	9.2E-06	2.4E-08			Lead	8.98E-06	3.5E-08			
Dibenzo(a,h)anthrace	6.9E-07	1.8E-09			Dibenzo(a,h)anthrace	6.83E-07	2.7E-09			
Dieldrin	1.2E-08	3.2E-11	5.0E-05	6.4E-07	Dieldrin	7.38E-09	2.9E-11	5.0E-05	1.4E-15	6.4E-07
Indeno(1,2,3-cd)pyre	2.2E-06	5.6E-09			Indeno(1,2,3-cd)pyre	2.15E-06	8.4E-09			
Phenanthrene	8.7E-07	2.2E-09			Phenanthrene	8.23E-07	3.2E-09			
TH-Total	1.3E-05	3.4E-08			TH-Total	1.33E-05	5.2E-08			
		Total Pathway:		2.8E-05				Total Pathway:		3.7E-05
		Total Rad + Chem		2.8E-05				Total Rad + Chem		3.7E-05

Total: 6.5E-05

TABLE B.3.2-14 (d)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			1.3E-12
NP-237	1.39E-06	1.2E-01	2.2E-10	2.6E-11	NP-237	1.39E-06	1.8E-01	2.2E-10	3.9E-11	6.5E-11	6.9E-11
PU-238			2.2E-10		PU-238			2.2E-10			1.9E-12
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.3E-12
RA-226			7.8E-10		RA-226			7.8E-10			1.1E-09
RA-228			1.0E-10		RA-228			1.0E-10			2.9E-11
SR-90	1.27E-05	1.1E+00	3.6E-11	3.9E-11	SR-90	1.27E-05	1.6E+00	3.6E-11	5.9E-11	9.7E-11	1.0E-10
TC-99	5.12E-03	4.3E+02	1.3E-12	5.6E-10	TC-99	5.12E-03	6.6E+02	1.3E-12	8.6E-10	1.4E-09	1.4E-09
TH-228			5.5E-11		TH-228			5.5E-11			1.8E-11
TH-230			1.3E-11		TH-230			1.3E-11			1.4E-11
TH-232			1.7E-10		TH-232			1.7E-10			5.2E-11
U-234	1.18E-01	9.9E+03	1.6E-11	1.6E-07	U-234	1.18E-01	1.5E+04	1.6E-11	2.4E-07	4.0E-07	4.0E-07
U-235/236	6.27E-03	5.3E+02	1.6E-11	8.4E-09	U-235/236	6.27E-03	8.1E+02	1.6E-11	1.3E-08	2.1E-08	2.1E-08
U-238	1.30E-01	1.1E+04	2.8E-11	3.1E-07	U-238	1.30E-01	1.7E+04	2.8E-11	4.7E-07	7.7E-07	7.7E-07
			Total Pathway:	4.7E-07				Total Pathway:	7.2E-07		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit				
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00	
Arsenic			1.8E+00		Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02		Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00		Beryllium			4.3E+00	
Lead	1.06E-16	2.3E-20			Lead	1.06E-16	3.6E-20		
Dibenzo(a,h)anthrac			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01		Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyr			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01	
Phenanthrene					Phenanthrene				
TH-Total					TH-Total				
2-Methylnaphthalene					2-Methylnaphthalene				
Tributyl phosphate					Tributyl phosphate				
U-Total	4.62E-01	1.0E-04			U-Total	4.62E-01	1.6E-04		
			Total Pathway:					Total Pathway:	

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TABLE B.3.2-14 (d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables				
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.4E-06			
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.3E-05			
TC-99	5.1E-03			
TH-228				
TH-230				
TH-232				
U-234	1.2E-01			
U-235/236	6.3E-03			
			Total Pathway:	

Ingestion/Fruit				
Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	1.39E-06			
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.27E-05			
TC-99	5.12E-03			
TH-228				
TH-230				
TH-232				
U-234	1.18E-01			
U-235/236	6.27E-03			
			Total Pathway:	

Chemical Hazard

Ingestion/Vegetables				
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.1E-16	2.7E-19		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	4.6E-01	1.2E-03	3.0E-03	3.9E-01
			Total Pathway:	3.9E-01
			Total Rad + Chem	3.9E-01

Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Aroclor-1254						
Aroclor-1260						
Arsenic			3.0E-04			
Benzo(a)anthracene						
Benzo(a)pyrene						
Benzo(b)fluoranthene						
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene						
Beryllium			5.0E-03			
Lead	1.06E-16	4.1E-19				
Dibenzo(a,h)anthracen						
Dieldrin			5.0E-05			
Indeno(1,2,3-cd)pyren						
Phenanthrene						
TH-Total						
2-Methylnaphthalene						
Tributyl phosphate			5.0E-03			
U-Total	4.62E-01	1.8E-03	3.0E-03	6.0E-01	1.0E+00	1.0E+00
			Total Pathway:	6.0E-01		
			Total Rad + Chem	6.0E-01	*Total:* 1.0E+00	1.0E+00

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TABLE B.3.2-15(a)
FUTURE, OFF-PROPERTY FARMER (Private Ownership)
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	1.4E+01	2.2E-10	3.0E-09
SR-90	2.3E-03	1.1E+02	3.6E-11	4.0E-09
TC-99	9.8E-01	4.8E+04	1.3E-12	6.2E-08
U-234	2.4E+01	1.2E+06	1.6E-11	1.9E-05
U-235/236	1.3E+00	6.3E+04	1.6E-11	1.0E-06
U-238	2.7E+01	1.3E+06	2.8E-11	3.6E-05

Total Pathway: 5.6E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene				
Lead	2.1E-17	5.6E-19		
Tributyl phosphate				
U-Total	9.5E-02	2.6E-03		

Total Pathway:

Total Rad + Chem 5.6E-05

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene			
Lead	2.1E-18		
Tributyl phosphate			
U-Total	9.7E-03		

Total Pathway:

Total Rad + Chem

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TABLE B.3.2-15(a)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	3.0E-09
	4.0E-09
	6.2E-08
	1.9E-05
	1.0E-06
	3.6E-05
Total Pathway:	

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene			
Lead	1.6E-21		
Tributyl phosphate			
U-Total	3.0E-08		
Total Pathway:			

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 5.6E-05

TABLE B.3.2-15(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	2.8E-04	1.4E+01			Not applicable
SR-90	2.3E-03	1.1E+02			
TC-99	9.8E-01	4.8E+04			
U-234	2.4E+01	1.2E+06			
U-235/236	1.3E+00	6.3E+04			
U-238	2.7E+01	1.3E+06			
Total Pathway:					Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene					2-Methylnaphthalene			
Lead	2.1E-17	5.6E-19			Lead	2.1E-18		
Tributyl phosphate			5.0E-03		Tributyl phosphate			
U-Total	9.5E-02	2.6E-03	3.0E-03	8.6E-01	U-Total	9.7E-03		
		Total Pathway:		8.6E-01			Total Pathway:	
		Total Rad + Chem		8.6E-01			Total Rad + Chem	

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TABLE B.3.2-15(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				Total
Dermal Contact/Groundwater				
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene				
Lead	1.6E-21			
Tributyl phosphate		4.5E-03		
U-Total	3.0E-08	1.5E-04	2.0E-04	8.6E-01
Total Pathway:			2.0E-04	
Total Rad + Chem			2.0E-04	*Total:* 8.6E-01

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TABLE B.3.2-15(b)
FUTURE, OFF-PROPERTY CHILD (private Ownership)
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	5.9E-01	2.2E-10	1.3E-10
SR-90	2.3E-03	4.7E+00	3.6E-11	1.7E-10
TC-99	9.8E-01	2.1E+03	1.3E-12	2.7E-09
U-234	2.4E+01	5.0E+04	1.6E-11	8.1E-07
U-235/236	1.3E+00	2.7E+03	1.6E-11	4.3E-08
U-238	2.7E+01	5.6E+04	2.8E-11	1.6E-06

Total Pathway: 2.4E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene				
Lead	2.1E-17	1.1E-19		
Tributyl phosphate				
U-Total	9.5E-02	5.2E-04		

Total Pathway:

Total Rad + Chem 2.4E-06

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene			
Lead	8.4E-19		
Tributyl phosphate			
U-Total	3.9E-03		

Total Pathway:

Total Rad + Chem

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TABLE B.3.2-15(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	1.3E-10
	1.7E-10
	2.7E-09
	8.1E-07
	4.3E-08
	1.6E-06

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene			
Lead	9.0E-25		
Tributyl phosphate			
U-Total	1.0E-06		

Total Pathway:

Total Rad + Chem *Total:* 2.4E-06

TABLE B.3.2-15(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.8E-04	5.9E-01		
SR-90	2.3E-03	4.7E+00		
TC-99	9.8E-01	2.1E+03		
U-234	2.4E+01	5.0E+04		
U-235/236	1.3E+00	2.7E+03		
U-238	2.7E+01	5.6E+04		
			Total Pathway:	

Inhalation/Groundwater
Not applicable
Total Pathway:

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene				
Lead	2.1E-17	1.3E-18		
Tributyl phosphate			5.0E-03	
U-Total	9.5E-02	6.0E-03	3.0E-03	2.0E+00
			Total Pathway:	2.0E+00
			Total Rad + Chem	2.0E+00

Inhalation/Groundwater			
Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene			
Lead	9.8E-18		
Tributyl phosphate			
U-Total	4.5E-02		
Total Pathway:			
Total Rad + Chem			

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TABLE B.3.2-15(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene				
Lead	1.0E-23			
Tributyl phosphate		4.5E-03		
U-Total	1.2E-05	1.5E-04	8.1E-02	2.1E+00
Total Pathway:			8.1E-02	
Total Rad + Chem			8.1E-02	*Total:* 2.1E+00

TABLE B.3.2-15(c)
FUTURE, OFF-PROPERTY FARMER (Federal Ownership)
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237	2.8E-04	1.4E+01	2.2E-10	3.0E-09	Not applicable
SR-90	2.3E-03	1.1E+02	3.6E-11	4.0E-09	
TC-99	9.8E-01	4.8E+04	1.3E-12	6.2E-08	
U-234	2.4E+01	1.2E+06	1.6E-11	1.9E-05	
U-235/236	1.3E+00	6.3E+04	1.6E-11	1.0E-06	
U-238	2.7E+01	1.3E+06	2.8E-11	3.6E-05	
			Total Pathway:	5.6E-05	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
2-Methylnaphthalene					2-Methylnaphthalene			
Lead	2.1E-17	5.6E-19			Lead	2.1E-18		
Tributyl phosphate					Tributyl phosphate			
U-Total	9.5E-02	2.6E-03			U-Total	9.7E-03		
			Total Pathway:				Total Pathway:	
			Total Rad + Chem	5.6E-05			Total Rad + Chem	

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TABLE B.3.2-15(c)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	3.0E-09
	4.0E-09
	6.2E-08
	1.9E-05
	1.0E-06
	3.6E-05
Total Pathway:	

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene			
Lead	1.6E-21		
Tributyl phosphate			
U-Total	3.0E-08		
Total Pathway:			

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem — *Total:* 5.6E-05

TABLE B.3.2-15(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.8E-04	1.4E+01		
SR-90	2.3E-03	1.1E+02		
TC-99	9.8E-01	4.8E+04		
U-234	2.4E+01	1.2E+06		
U-235/236	1.3E+00	6.3E+04		
U-238	2.7E+01	1.3E+06		
Total Pathway:				

Inhalation/Groundwater
Not applicable
Total Pathway:

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene				
Lead	2.1E-17	5.6E-19		
Tributyl phosphate			5.0E-03	
U-Total	9.5E-02	2.6E-03	3.0E-03	8.6E-01
Total Pathway:				8.6E-01
Total Rad + Chem				8.6E-01

Inhalation/Groundwater			
Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene			
Lead	2.1E-18		
Tributyl phosphate			
U-Total	9.7E-03		
Total Pathway:			
Total Rad + Chem			

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TABLE B.3.2-15(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene				
Lead	1.6E-21			
Tributyl phosphate		4.5E-03		
U-Total	3.0E-08	1.5E-04	2.0E-04	8.6E-01
Total Pathway:			2.0E-04	

Total Rad + Chem	2.0E-04	*Total:*	8.6E-01

TABLE B.3.2-15(d)
FUTURE, OFF-PROPERTY CHILD (Federal Ownership)
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	5.9E-01	2.2E-10	1.3E-10
SR-90	2.3E-03	4.7E+00	3.6E-11	1.7E-10
TC-99	9.8E-01	2.1E+03	1.3E-12	2.7E-09
U-234	2.4E+01	5.0E+04	1.6E-11	8.1E-07
U-235/236	1.3E+00	2.7E+03	1.6E-11	4.3E-08
U-238	2.7E+01	5.6E+04	2.8E-11	1.6E-06

Total Pathway: 2.4E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene				
Lead	2.1E-17	1.1E-19		
Tributyl phosphate				
U-Total	9.5E-02	5.2E-04		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene			
Lead	8.4E-19		
Tributyl phosphate			
U-Total	3.9E-03		

Total Pathway:

Total Rad + Chem 2.4E-06

Total Rad + Chem

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TABLE B.3.2-15(d)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	1.3E-10
	1.7E-10
	2.7E-09
	8.1E-07
	4.3E-08
	1.6E-06
Total Pathway:	

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene			
Lead	9.0E-25		
Tributyl phosphate			
U-Total	1.0E-06		
Total Pathway:			

Total Rad + Chem — *Total:* 2.4E-06

TABLE B.3.2-15(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.8E-04	5.9E-01		
SR-90	2.3E-03	4.7E+00		
TC-99	9.8E-01	2.1E+03		
U-234	2.4E+01	5.0E+04		
U-235/236	1.3E+00	2.7E+03		
U-238	2.7E+01	5.6E+04		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene				
Lead	2.1E-17	1.3E-18		
Tributyl phosphate			5.0E-03	
U-Total	9.5E-02	6.0E-03	3.0E-03	2.0E+00

Total Pathway: 2.0E+00

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene			
Lead	9.8E-18		
Tributyl phosphate			
U-Total	4.5E-02		

Total Pathway:

Total Rad + Chem 2.0E+00

Total Rad + Chem

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TABLE B.3.2-15(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene				
Lead	1.0E-23			
Tributyl phosphate		4.5E-03		
U-Total	1.2E-05	1.5E-04	8.1E-02	2.1E+00
Total Pathway:			8.1E-02	

Total Rad + Chem	8.1E-02	*Total:*	2.1E+00

TABLE B.3.2-16
FUTURE, EXPANDED TRESPASSER
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	4.9E-06	1.6E-02	1.9E-11	3.1E-13
NP-237	2.1E-06	6.9E-03	2.9E-08	2.0E-10
PU-238	1.2E-06	3.7E-03	3.9E-08	1.5E-10
PU-239/240	7.5E-07	2.4E-03	3.8E-08	9.3E-11
RA-226	3.1E-04	9.9E-01	7.0E-09	6.9E-09
RA-228	3.8E-05	1.2E-01	6.9E-10	8.6E-11
SR-90	1.6E-05	5.2E-02	6.2E-11	3.2E-12
TC-99	1.4E-03	4.6E+00	8.3E-12	3.8E-11
TH-228	4.4E-05	1.4E-01	7.8E-08	1.1E-08
TH-230	1.4E-04	4.5E-01	2.9E-08	1.3E-08
TH-232	4.0E-05	1.3E-01	1.1E-07	1.4E-08
U-234	8.6E-05	2.8E-01	2.6E-08	7.2E-09
U-235/236	8.8E-06	2.9E-02	2.5E-08	7.2E-10
U-238	9.2E-05	3.0E-01	5.2E-08	1.6E-08
			Total Pathway:	6.9E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.50	1.6E+01	2.8E-11	4.5E-10
NP-237	0.21	7.0E+00	2.2E-10	1.5E-09
PU-238	0.12	3.8E+00	2.2E-10	8.3E-10
PU-239/240	0.08	2.5E+00	2.3E-10	5.7E-10
RA-226	30.80	1.0E+03	7.8E-10	7.8E-07
RA-228	3.88	1.3E+02	1.0E-10	1.3E-08
SR-90	1.60	5.2E+01	3.6E-11	1.9E-09
TC-99	142	4.6E+03	1.3E-12	6.0E-09
TH-228	4.41	1.4E+02	5.5E-11	7.9E-09
TH-230	13.80	4.5E+02	1.3E-11	5.8E-09
TH-232	3.99	1.3E+02	1.7E-10	2.2E-08
U-234	8.66	2.8E+02	1.6E-11	4.5E-09
U-235/236	0.89	2.9E+01	1.6E-11	4.6E-10
U-238	9.31	3.0E+02	2.8E-11	8.5E-09
			Total Pathway:	8.5E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	8.81E-10	2.3E-12		
Aroclor-1260	5.15E-10	1.3E-12		
Arsenic	7.20E-08	1.9E-10	1.5E+01	2.8E-09
Benzo(a)anthracene	5.45E-08	1.4E-10	6.1E-01	8.6E-11
Benzo(a)pyrene	9.31E-08	2.4E-10	6.1E+00	1.5E-09
Benzo(b)fluoranthene	6.14E-08	1.6E-10	6.1E-01	9.7E-11
Benzo(g,h,i)perylene	6.15E-08	1.6E-10		
Benzo(k)fluoranthene	7.23E-08	1.9E-10	6.1E-02	1.1E-11
Beryllium	9.33E-09	2.4E-11	8.4E+00	2.0E-10
Lead	2.43E-07	6.3E-10		
Dibenzo(a,h)anthracene	1.88E-08	4.9E-11	6.1E+00	3.0E-10
Dieldrin	9.90E-11	2.6E-13	1.6E+01	4.1E-12
Indeno(1,2,3-cd)pyrene	5.94E-08	1.5E-10	6.1E-01	9.4E-11
Phenanthrene	2.28E-08	5.9E-11		
TH-Total	3.64E-07	9.4E-10		
			Total Pathway:	5.1E-09
			Total Rad + Chem	7.4E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.09	2.1E-09	7.7E+00	1.6E-08
Aroclor-1260	0.05	1.2E-09	7.7E+00	9.6E-09
Arsenic	7.27	1.7E-07	1.8E+00	3.0E-07
Benzo(a)anthracene	5.50	1.3E-07	7.3E-01	9.6E-08
Benzo(a)pyrene	9.40	2.3E-07	7.3E+00	1.6E-06
Benzo(b)fluoranthene	6.20	1.5E-07	7.3E-01	1.1E-07
Benzo(g,h,i)perylene	6.20	1.5E-07		
Benzo(k)fluoranthene	7.30	1.7E-07	7.3E-02	1.3E-08
Beryllium	0.94	2.3E-08	4.3E+00	9.7E-08
Lead	24.58	5.9E-07		
Dibenzo(a,h)anthracene	1.90	4.6E-08	7.3E+00	3.3E-07
Dieldrin	0.01	2.4E-10	1.6E+01	3.8E-09
Indeno(1,2,3-cd)pyrene	6.00	1.4E-07	7.3E-01	1.0E-07
Phenanthrene	2.30	5.5E-08		
TH-Total	36.70	8.8E-07		
			Total Pathway:	2.7E-06
			Total Rad + Chem	3.6E-06

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TABLE B.3.2-16
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	2.2E-01	2.0E-06	4.5E-07	4.5E-07
	NP-237	9.6E-02	4.3E-07	4.1E-08	4.3E-08
	PU-238	5.2E-02	2.8E-11	1.5E-12	9.8E-10
	PU-239/24	3.4E-02	2.7E-11	9.2E-13	6.6E-10
	RA-226	1.4E+01	6.0E-06	8.3E-05	8.3E-05
	RA-228	1.7E+00	2.9E-06	5.0E-06	5.0E-06
	SR-90	7.2E-01			1.9E-09
	TC-99	6.4E+01	6.0E-13	3.8E-11	6.1E-09
	TH-228	2.0E+00	5.6E-06	1.1E-05	1.1E-05
	TH-230	6.2E+00	5.4E-11	3.3E-10	1.9E-08
	TH-232	1.8E+00	8.5E-06	1.5E-05	1.5E-05
	U-234	3.9E+00	3.0E-11	1.2E-10	1.2E-08
	U-235/236	4.0E-01	2.4E-07	9.5E-08	9.6E-08
	U-238	4.2E+00	3.6E-08	1.5E-07	1.7E-07
Total Pathway:			Total Pathway:		1.1E-04

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	4.9E-08	1.0E+01	5.0E-07					5.2E-07
Aroclor-1260	2.9E-08	1.0E+01	2.9E-07					3.0E-07
Arsenic	6.7E-08	1.8E+00	1.2E-07					4.3E-07
Benzo(a)anthracene			9.6E-08					1.9E-07
Benzo(a)pyrene			1.6E-06					3.3E-06
Benzo(b)fluoranthene			1.1E-07					2.2E-07
Benzo(g,h,i)perylene	1.7E-05							
Benzo(k)fluoranthene			1.3E-08					2.6E-08
Beryllium	8.6E-08		9.7E-08					1.9E-07
Lead	2.3E-06			Not applicable				
Dibenzo(a,h)anthracene			3.3E-07					6.7E-07
Dieldrin	5.5E-09	1.6E+01	8.8E-08					9.2E-08
Indeno(1,2,3-cd)pyrene			1.0E-07					2.1E-07
Phenanthrene	6.3E-06							
TH-Total	3.4E-06							
		Total Pathway:	3.4E-06			Total Pathway:		

Total Rad + Chem 3.4E-06 1.1E-04 *Total:* 1.2E-04

TABLE B.3.2-16
(continued)
SOUTH FIELD: SURFACE SOIL
Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	4.94E-06	1.6E-02		
NP-237	2.12E-06	6.9E-03		
PU-238	1.15E-06	3.7E-03		
PU-239/240	7.53E-07	2.4E-03		
RA-226	3.05E-04	9.9E-01		
RA-228	3.84E-05	1.2E-01		
SR-90	1.59E-05	5.2E-02		
TC-99	1.41E-03	4.6E+00		
TH-228	4.37E-05	1.4E-01		
TH-230	1.37E-04	4.5E-01		
TH-232	3.95E-05	1.3E-01		
U-234	8.57E-05	2.8E-01		
U-235/236	8.80E-06	2.9E-02		
U-238	9.22E-05	3.0E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	4.99E-01	1.6E+01		
NP-237	2.14E-01	7.0E+00		
PU-238	1.16E-01	3.8E+00		
PU-239/240	7.60E-02	2.5E+00		
RA-226	3.08E+01	1.0E+03		
RA-228	3.88E+00	1.3E+02		
SR-90	1.60E+00	5.2E+01		
TC-99	1.42E+02	4.6E+03		
TH-228	4.41E+00	1.4E+02		
TH-230	1.38E+01	4.5E+02		
TH-232	3.99E+00	1.3E+02		
U-234	8.66E+00	2.8E+02		
U-235/236	8.87E-01	2.9E+01		
U-238	9.31E+00	3.0E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.81E-10	3.6E-12		
Aroclor-1260	5.15E-10	2.1E-12		
Arsenic	7.20E-08	3.0E-10		
Benzo(a)anthracene	5.45E-08	2.2E-10		
Benzo(a)pyrene	9.31E-08	3.8E-10		
Benzo(b)fluoranthene	6.14E-08	2.5E-10		
Benzo(g,h,i)perylene	6.15E-08	2.5E-10		
Benzo(k)fluoranthene	7.23E-08	3.0E-10		
Beryllium	9.33E-09	3.8E-11		
Lead	2.43E-07	1.0E-09		
Dibenzo(a,h)anthracene	1.88E-08	7.7E-11		
Dieldrin	9.90E-11	4.1E-13		
Indeno(1,2,3-cd)pyrene	5.94E-08	2.4E-10		
Phenanthrene	2.28E-08	9.4E-11		
TH-Total	3.64E-07	1.5E-09		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	8.90E-02	3.4E-09		
Aroclor-1260	5.20E-02	2.0E-09		
Arsenic	7.27E+00	2.8E-07	3.0E-04	9.2E-04
Benzo(a)anthracene	5.50E+00	2.1E-07		
Benzo(a)pyrene	9.40E+00	3.6E-07		
Benzo(b)fluoranthene	6.20E+00	2.4E-07		
Benzo(g,h,i)perylene	6.20E+00	2.4E-07		
Benzo(k)fluoranthene	7.30E+00	2.8E-07		
Beryllium	9.42E-01	3.6E-08	5.0E-03	7.2E-06
Lead	2.46E+01	9.4E-07		
Dibenzo(a,h)anthracene	1.90E+00	7.2E-08		
Dieldrin	1.00E-02	3.8E-10	5.0E-05	7.6E-06
Indeno(1,2,3-cd)pyrene	6.00E+00	2.3E-07		
Phenanthrene	2.30E+00	8.8E-08		
TH-Total	3.67E+01	1.4E-06		

Total Pathway: 9.4E-04

Total Rad + Chem 9.4E-04

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TABLE B.3.2-16
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	2.2E-01		
	NP-237	9.6E-02		
	PU-238	5.2E-02		
	PU-239/240	3.4E-02		
	RA-226	1.4E+01		
	RA-228	1.7E+00		
	SR-90	7.2E-01		
	TC-99	6.4E+01		
	TH-228	2.0E+00		
	TH-230	6.2E+00		
	TH-232	1.8E+00		
	U-234	3.9E+00		
	U-235/236	4.0E-01		
	U-238	4.2E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	7.8E-08							
Aroclor-1260	4.5E-08							
Arsenic	1.1E-07	2.9E-04	3.7E-04					1.3E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.7E-05							
Benzo(k)fluoranthene								
Beryllium	1.4E-07	5.0E-05	2.7E-03					2.8E-03
Lead	3.6E-06			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin	8.7E-09	5.0E-05	1.7E-04					1.8E-04
Indeno(1,2,3-cd)pyrene								
Phenanthrene	1.0E-05							
TH-Total	5.3E-06							
Total Pathway:			3.3E-03	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 3.3E-03

otal: 4.2E-03

TABLE B.3.2-17
FUTURE, EXPANDED TRESPASSER
SOUTH FIELD: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment					Dermal Contact/Sediment	External Radiation/Sediment			Total
Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk		Compound	Intake	SF(e)	Risk	
NP-237	2.10E-01	8.3E-01	2.2E-10	1.8E-10		NP-237	1.5E-02	4.3E-07	6.4E-09	6.6E-09
PU-238	1.16E-01	4.6E-01	2.2E-10	1.0E-10	Not applicable	PU-238	8.3E-03	2.8E-11	2.3E-13	1.0E-10
RA-226	3.08E+01	1.2E+02	7.8E-10	9.4E-08		RA-226	2.2E+00	6.0E-06	1.3E-05	1.3E-05
RA-228	3.89E+00	1.5E+01	1.0E-10	1.5E-09		RA-228	2.8E-01	2.9E-06	8.0E-07	8.1E-07
SR-90	1.55E-01	6.1E-01	3.6E-11	2.2E-11		SR-90	1.1E-02			2.2E-11
TC-99	6.19E+01	2.4E+02	1.3E-12	3.2E-10		TC-99	4.4E+00	6.0E-13	2.6E-12	3.2E-10
U-234	8.15E+00	3.2E+01	1.6E-11	5.1E-10		U-234	5.8E-01	3.0E-11	1.7E-11	5.3E-10
U-235/236	8.38E-01	3.3E+00	1.6E-11	5.3E-11		U-235/236	6.0E-02	2.4E-07	1.4E-08	1.4E-08
U-238	8.77E+00	3.4E+01	2.8E-11	9.7E-10		U-238	6.2E-01	3.6E-08	2.2E-08	2.3E-08
		Total Pathway:		9.8E-08	Total Pathway:			Total Pathway:	1.4E-05	

Chemical Risk

Ingestion/Sediment					Dermal Contact/Sediment			External Radiation/Sediment			
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Benzo(a)pyrene	9.40E+00	3.4E-08	7.3E+00	2.5E-07	Benzo(a)pyrene			2.5E-07					4.9E-07
Benzo(b)fluoranthene	6.20E+00	2.2E-08	7.3E-01	1.6E-08	Benzo(b)fluoranthene			1.6E-08					3.2E-08
Benzo(g,h,i)perylene	6.20E+00	2.2E-08			Benzo(g,h,i)perylene	5.4E-06							
Arsenic	7.27E+00	2.6E-08	1.8E+00	4.6E-08	Arsenic	2.1E-08	1.8E+00	3.9E-08		Not applicable			8.5E-08
Beryllium	9.42E-01	3.4E-09	4.3E+00	1.4E-08	Beryllium	2.7E-08		1.4E-08					2.9E-08
Lead	2.45E+01	8.8E-08			Lead	7.1E-07							
U-TOTAL	2.79E+01	1.0E-07			U-TOTAL	8.1E-07							
Benzo(a)anthracene	5.50E+00	2.0E-08	7.3E-01	1.4E-08	Benzo(a)anthracene			1.4E-08					2.9E-08
Dieldrin	9.55E-03	3.4E-11	1.6E+01	5.5E-10	Dieldrin	1.7E-09							5.5E-10
Dibenzo(a,h)anthracene	1.90E+00	6.8E-09	7.3E+00	5.0E-08	Dibenzo(a,h)anthracene			5.0E-08					9.9E-08
Phenanthrene	2.30E+00	8.2E-09			Phenanthrene								
		Total Pathway:		3.9E-07		Total Pathway:		3.8E-07		Total Pathway:			

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	4.8E-07	Total Rad + Chem	3.8E-07	Total Rad + Chem	1.4E-05	*Total:*	1.5E-05

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TABLE B.3.2-17
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	0.21	8.3E-01		
PU-238	0.12	4.6E-01		
RA-226	30.80	1.2E+02		
RA-228	3.89	1.5E+01		
SR-90	0.16	6.1E-01		
TC-99	61.90	2.4E+02		
U-234	8.15	3.2E+01		
U-235/236	0.84	3.3E+00		

Total Pathway:

Dermal Contact/Sediment

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Sediment

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Benzo(a)pyrene	9.40E+00	2.0E-07		
Benzo(b)fluoranthene	6.20E+00	1.3E-07		
Benzo(g,h,i)perylene	6.20E+00	1.3E-07		
Arsenic	7.27E+00	1.5E-07	3.0E-04	5.1E-04
Beryllium	9.42E-01	2.0E-08	5.0E-03	3.9E-06
Lead	2.45E+01	5.1E-07		
U-TOTAL	2.79E+01	5.8E-07	3.0E-03	1.9E-04
Benzo(a)anthracene	5.50E+00	1.1E-07		
Dieldrin	9.55E-03	2.0E-10	5.0E-05	4.0E-06
Dibenzo(a,h)anthracene	1.90E+00	4.0E-08		
Phenanthrene	2.30E+00	4.8E-08		

Total Pathway: 7.1E-04

Total Rad + Chem 7.1E-04

Dermal Contact/Sediment

Compound	Intake	RfD(derm)	Hazard	
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene	3.2E-05			
Arsenic	1.2E-07	2.9E-04	4.3E-04	9.4E-04
Beryllium	1.6E-07	5.0E-05	3.2E-03	3.2E-03
Lead	4.2E-06			
U-TOTAL	4.7E-06	1.5E-04	3.9E-04	5.8E-04
Benzo(a)anthracene				
Dieldrin	9.7E-09	5.0E-05	1.9E-04	2.0E-04
Dibenzo(a,h)anthracene				
Phenanthrene	1.2E-05			

Total Pathway: 4.2E-03

Total Rad + Chem 4.2E-03

Total

Total: 4.9E-03

TABLE B.3.2-18
FUTURE, EXPANDED TRESPASSER
SOUTH FIELD: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	8.00E-01	1.7E+01	2.2E-10	3.8E-09		3.8E-09
PU-238	2.18E-02	4.8E-01	2.2E-10	1.0E-10	Not applicable	1.0E-10
RA-226	5.46E+00	1.2E+02	7.8E-10	9.3E-08		9.3E-08
RA-228	6.90E-01	1.5E+01	1.0E-10	1.5E-09		1.5E-09
SR-90	1.16E+00	2.5E+01	3.6E-11	9.1E-10		9.1E-10
TC-99	1.67E+04	3.6E+05	1.3E-12	4.7E-07		4.7E-07
U-234	1.40E+02	3.1E+03	1.6E-11	4.9E-08		4.9E-08
U-235/236	1.23E+01	2.7E+02	1.6E-11	4.3E-09		4.3E-09
U-238	1.51E+02	3.3E+03	2.8E-11	9.2E-08		9.2E-08
			Total Pathway:	7.2E-07	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	6.8E-04	1.4E-08	1.8E+00	2.4E-08	Arsenic	2.0E-09	1.8E+00	3.7E-09	2.7E-08
Benzo(a)anthracene	1.4E-04	2.8E-09	7.3E-01	2.1E-09	Benzo(a)anthracene	3.4E-07		2.1E-09	4.1E-09
Benzo(a)pyrene	1.0E-04	2.0E-09	7.3E+00	1.5E-08	Benzo(a)pyrene	3.6E-07		1.5E-08	3.0E-08
Benzo(b)fluoranthene	1.7E-05	3.4E-10	7.3E-01	2.5E-10	Benzo(b)fluoranthene	6.0E-08		2.5E-10	5.0E-10
Benzo(g,h,i)perylene	4.9E-04	9.7E-09			Benzo(g,h,i)perylene	7.6E-06			
Beryllium	7.1E-05	1.4E-09	4.3E+00	6.1E-09	Beryllium	2.1E-10		6.1E-09	1.2E-08
Dibenzo(a,h)anthrace	2.1E-05	4.2E-10	7.3E+00	3.0E-09	Dibenzo(a,h)anthrace	1.7E-07		3.0E-09	6.1E-09
Dieldrin	3.1E-05	6.2E-10	1.6E+01	1.0E-08	Dieldrin	1.5E-09	1.6E+01	2.3E-08	3.3E-08
Lead	1.2E-02	2.4E-07			Lead	1.4E-10			
Phenanthrene	1.5E-01	3.0E-06			Phenanthrene	1.0E-04			
U-Total	4.6E-01	9.2E-06			U-Total	1.4E-06			
			Total Pathway:	6.0E-08			Total Pathway:	5.3E-08	
			Total Rad + Chem	7.8E-07			Total Rad + Chem	5.3E-08	Total: 8.3E-07

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TABLE B.3.2-18
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard					
NP-237	8.00E-01	1.7E+01			Not applicable				
PU-238	2.18E-02	4.8E-01							
RA-226	5.46E+00	1.2E+02							
RA-228	6.90E-01	1.5E+01							
SR-90	1.16E+00	2.5E+01							
TC-99	1.67E+04	3.6E+05							
U-234	1.40E+02	3.1E+03							
U-235/236	1.23E+01	2.7E+02							
U-238	1.51E+02	3.3E+03							
		Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	6.84E-04	7.9E-08	3.0E-04	2.6E-04	Arsenic	1.2E-08	2.9E-04	4.1E-05	3.1E-04
Benzo(a)anthracene	1.42E-04	1.6E-08			Benzo(a)anthracene	2.0E-06			
Benzo(a)pyrene	1.02E-04	1.2E-08			Benzo(a)pyrene	2.1E-06			
Benzo(b)fluoranthene	1.72E-05	2.0E-09			Benzo(b)fluoranthene	3.5E-07			
Benzo(g,h,i)perylene	4.87E-04	5.6E-08			Benzo(g,h,i)perylene	4.4E-05			
Beryllium	7.09E-05	8.2E-09	5.0E-03	1.6E-06	Beryllium	1.2E-09	5.0E-05	2.4E-05	2.6E-05
Dibenzo(a,h)anthrace	2.10E-05	2.4E-09			Dibenzo(a,h)anthrace	9.6E-07			
Dieldrin	3.13E-05	3.6E-09	5.0E-05	7.3E-05	Dieldrin	8.5E-09	5.0E-05	1.7E-04	2.4E-04
Lead	1.22E-02	1.4E-06			Lead	8.3E-10			
Phenanthrene	1.51E-01	1.8E-05			Phenanthrene	5.9E-04			
U-Total	4.64E-01	5.4E-05	3.0E-03	1.8E-02	U-Total	7.9E-06	1.5E-04	5.3E-02	7.1E-02
		Total Pathway:		1.8E-02			Total Pathway:	5.3E-02	
		Total Rad + Chem		1.8E-02			Total Rad + Chem	5.3E-02	Total: 7.1E-02

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TABLE B.3.2-19(a)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.8E-04	2.1E+01	1.9E-11	3.9E-10
NP-237	7.6E-05	8.9E+00	2.9E-08	2.6E-07
PU-238	4.1E-05	4.8E+00	3.9E-08	1.9E-07
PU-239/240	2.7E-05	3.1E+00	3.8E-08	1.2E-07
RA-226	1.1E-02	1.3E+03	7.0E-09	8.9E-06
RA-228	1.4E-03	1.6E+02	6.9E-10	1.1E-07
SR-90	5.7E-04	6.6E+01	6.2E-11	4.1E-09
TC-99	5.1E-02	5.9E+03	8.3E-12	4.9E-08
TH-228	1.6E-03	1.8E+02	7.8E-08	1.4E-05
TH-230	4.9E-03	5.7E+02	2.9E-08	1.7E-05
TH-232	1.4E-03	1.6E+02	1.1E-07	1.8E-05
U-234	3.1E-03	3.6E+02	2.6E-08	9.3E-06
U-235/236	3.2E-04	3.7E+01	2.5E-08	9.2E-07
U-238	3.3E-03	3.8E+02	5.2E-08	2.0E-05
			Total Pathway:	8.9E-05

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.50	2.2E+03	2.8E-11	6.2E-08
NP-237	0.21	9.4E+02	2.2E-10	2.1E-07
PU-238	0.12	5.1E+02	2.2E-10	1.1E-07
PU-239/240	0.08	3.4E+02	2.3E-10	7.7E-08
RA-226	30.80	1.4E+05	7.8E-10	1.1E-04
RA-228	3.88	1.7E+04	1.0E-10	1.7E-06
SR-90	1.60	7.1E+03	3.6E-11	2.5E-07
TC-99	142	6.3E+05	1.3E-12	8.1E-07
TH-228	4.41	1.9E+04	5.5E-11	1.1E-06
TH-230	13.80	6.1E+04	1.3E-11	7.9E-07
TH-232	3.99	1.8E+04	1.7E-10	3.0E-06
U-234	8.66	3.8E+04	1.6E-11	6.1E-07
U-235/236	0.89	3.9E+03	1.6E-11	6.3E-08
U-238	9.31	4.1E+04	2.8E-11	1.1E-06
			Total Pathway:	1.2E-04

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	3.18E-08	2.1E-09		
Aroclor-1260	1.86E-08	1.2E-09		
Arsenic	2.59E-06	1.7E-07	1.5E+01	2.5E-06
Benzo(a)anthracene	1.96E-06	1.3E-07	6.1E-01	7.7E-08
Benzo(a)pyrene	3.36E-06	2.2E-07	6.1E+00	1.3E-06
Benzo(b)fluoranthene	2.21E-06	1.4E-07	6.1E-01	8.7E-08
Benzo(g,h,i)perylene	2.21E-06	1.4E-07		
Benzo(k)fluoranthene	2.61E-06	1.7E-07	6.1E-02	1.0E-08
Beryllium	3.36E-07	2.2E-08	8.4E+00	1.8E-07
Lead	8.78E-06	5.7E-07		
Dibenzo(a,h)anthracene	6.78E-07	4.4E-08	6.1E+00	2.7E-07
Dieldrin	3.57E-09	2.3E-10	1.6E+01	3.7E-09
Indeno(1,2,3-cd)pyrene	2.14E-06	1.4E-07	6.1E-01	8.5E-08
Phenanthrene	8.21E-07	5.3E-08		
TH-Total	1.31E-05	8.5E-07		
			Total Pathway:	4.6E-06
			Total Rad + Chem	9.3E-05

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.09	2.2E-07	7.7E+00	1.7E-06
Aroclor-1260	0.05	1.3E-07	7.7E+00	9.9E-07
Arsenic	7.27	1.8E-05	1.8E+00	3.1E-05
Benzo(a)anthracene	5.50	1.4E-05	7.3E-01	9.9E-06
Benzo(a)pyrene	9.40	2.3E-05	7.3E+00	1.7E-04
Benzo(b)fluoranthene	6.20	1.5E-05	7.3E-01	1.1E-05
Benzo(g,h,i)perylene	6.20	1.5E-05		
Benzo(k)fluoranthene	7.30	1.8E-05	7.3E-02	1.3E-06
Beryllium	0.94	2.3E-06	4.3E+00	1.0E-05
Lead	24.58	6.1E-05		
Dibenzo(a,h)anthracene	1.90	4.7E-06	7.3E+00	3.4E-05
Dieldrin	0.01	2.5E-08	1.6E+01	3.9E-07
Indeno(1,2,3-cd)pyrene	6.00	1.5E-05	7.3E-01	1.1E-05
Phenanthrene	2.30	5.7E-06		
TH-Total	36.70	9.0E-05		
			Total Pathway:	2.8E-04
			Total Rad + Chem	4.0E-04

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TABLE B.3.2-19(a)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	2.1E+01	2.0E-06	4.1E-05	4.2E-05
	NP-237	8.9E+00	4.3E-07	3.8E-06	4.3E-06
	PU-238	4.8E+00	2.8E-11	1.3E-10	3.0E-07
	PU-239/24	3.2E+00	2.7E-11	8.5E-11	2.0E-07
	RA-226	1.3E+03	6.0E-06	7.7E-03	7.8E-03
	RA-228	1.6E+02	2.9E-06	4.7E-04	4.7E-04
	SR-90	6.6E+01			2.6E-07
	TC-99	5.9E+03	6.0E-13	3.5E-09	8.7E-07
	TH-228	1.8E+02	5.6E-06	1.0E-03	1.0E-03
	TH-230	5.7E+02	5.4E-11	3.1E-08	1.7E-05
	TH-232	1.7E+02	8.5E-06	1.4E-03	1.4E-03
	U-234	3.6E+02	3.0E-11	1.1E-08	9.9E-06
	U-235/236	3.7E+01	2.4E-07	8.8E-06	9.8E-06
	U-238	3.9E+02	3.6E-08	1.4E-05	3.5E-05
Total Pathway:	Total Pathway: 1.1E-02				

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	4.2E-07	1.0E+01	4.3E-06					6.0E-06
Aroclor-1260	2.5E-07	1.0E+01	2.5E-06					3.5E-06
Arsenic	5.7E-07	1.8E+00	1.1E-06					3.5E-05
Benzo(a)anthracene			9.9E-06					2.0E-05
Benzo(a)pyrene			1.7E-04					3.4E-04
Benzo(b)fluoranthene			1.1E-05					2.2E-05
Benzo(g,h,i)perylene	1.5E-04							
Benzo(k)fluoranthene			1.3E-06					2.6E-06
Beryllium	7.4E-07		1.0E-05					2.0E-05
Lead	1.9E-05			Not applicable				
Dibenzo(a,h)anthracene			3.4E-05					6.9E-05
Dieldrin	4.7E-08	1.6E+01	7.6E-07					1.2E-06
Indeno(1,2,3-cd)pyrene			1.1E-05					2.2E-05
Phenanthrene	5.4E-05							
TH-Total	2.9E-05							
	Total Pathway:		2.6E-04	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.6E-04 1.1E-02 *Total:* 1.1E-02

TABLE B.3.2-19(a)
(continued)

Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil					Ingestion/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	1.78E-04	2.1E+01			CS-137	0.50	2.2E+03		
NP-237	7.64E-05	8.9E+00			NP-237	0.21	9.4E+02		
PU-238	4.14E-05	4.8E+00			PU-238	0.12	5.1E+02		
PU-239/240	2.71E-05	3.1E+00			PU-239/240	0.08	3.4E+02		
RA-226	1.10E-02	1.3E+03			RA-226	30.80	1.4E+05		
RA-228	1.38E-03	1.6E+02			RA-228	3.88	1.7E+04		
SR-90	5.71E-04	6.6E+01			SR-90	1.60	7.1E+03		
TC-99	5.07E-02	5.9E+03			TC-99	142.00	6.3E+05		
TH-228	1.57E-03	1.8E+02			TH-228	4.41	1.9E+04		
TH-230	4.93E-03	5.7E+02			TH-230	13.80	6.1E+04		
TH-232	1.42E-03	1.6E+02			TH-232	3.99	1.8E+04		
U-234	3.09E-03	3.6E+02			U-234	8.66	3.8E+04		
U-235/236	3.17E-04	3.7E+01			U-235/236	0.89	3.9E+03		
U-238	3.32E-03	3.8E+02			U-238	9.31	4.1E+04		
		Total Pathway:						Total Pathway:	

Chemical Hazard

Inhalation of Particulates/Soil					Ingestion/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard	Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	3.18E-08	2.1E-09			Aroclor-1254	0.09	2.2E-07		
Aroclor-1260	1.86E-08	1.2E-09			Aroclor-1260	0.05	1.3E-07		
Arsenic	2.59E-06	1.7E-07			Arsenic	7.27	1.8E-05	3.0E-04	6.0E-02
Benzo(a)anthracene	1.96E-06	1.3E-07			Benzo(a)anthracene	5.50	1.4E-05		
Benzo(a)pyrene	3.36E-06	2.2E-07			Benzo(a)pyrene	9.40	2.3E-05		
Benzo(b)fluoranthene	2.21E-06	1.4E-07			Benzo(b)fluoranthene	6.20	1.5E-05		
Benzo(g,h,i)perylene	2.21E-06	1.4E-07			Benzo(g,h,i)perylene	6.20	1.5E-05		
Benzo(k)fluoranthene	2.61E-06	1.7E-07			Benzo(k)fluoranthene	7.30	1.8E-05		
Beryllium	3.36E-07	2.2E-08			Beryllium	0.94	2.3E-06	5.0E-03	4.6E-04
Lead	8.78E-06	5.7E-07			Lead	24.58	6.1E-05		
Dibenzo(a,h)anthracene	6.78E-07	4.4E-08			Dibenzo(a,h)anthracene	1.90	4.7E-06		
Dieldrin	3.57E-09	2.3E-10			Dieldrin	0.01	2.5E-08	5.0E-05	4.9E-04
Indeno(1,2,3-cd)pyrene	2.14E-06	1.4E-07			Indeno(1,2,3-cd)pyrene	6.00	1.5E-05		
Phenanthrene	8.21E-07	5.3E-08			Phenanthrene	2.30	5.7E-06		
TH-Total	1.31E-05	8.5E-07			TH-Total	36.70	9.0E-05		
		Total Pathway:						Total Pathway:	6.1E-02
		Total Rad + Chem						Total Rad + Chem	6.1E-02

TABLE B.3.2-19(a)
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	2.1E+01		
	NP-237	8.9E+00		
	PU-238	4.8E+00		
	PU-239/240	3.2E+00		
	RA-226	1.3E+03		
	RA-228	1.6E+02		
	SR-90	6.6E+01		
	TC-99	5.9E+03		
	TH-228	1.8E+02		
	TH-230	5.7E+02		
	TH-232	1.7E+02		
	U-234	3.6E+02		
	U-235/236	3.7E+01		
	U-238	3.9E+02		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	4.2E-07							
Aroclor-1260	2.5E-07							
Arsenic	5.7E-07	2.9E-04	2.0E-03					6.2E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.5E-04							
Benzo(k)fluoranthene								
Beryllium	7.4E-07	5.0E-05	1.5E-02					1.5E-02
Lead	1.9E-05				Not applicable			
Dibenzo(a,h)anthracene								
Dieldrin	4.7E-08	5.0E-05	9.5E-04					1.4E-03
Indeno(1,2,3-cd)pyrene								
Phenanthrene	5.4E-05							
TH-Total	2.9E-05							
	Total Pathway:		1.8E-02		Total Pathway:			
	Total Rad + Chem		1.8E-02					*otal:* 7.8E-02

TABLE B.3.2-19(b)
FUTURE, ON-PROPERTY CHILD
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.8E-04	3.7E-01	1.9E-11	7.1E-12
NP-237	7.6E-05	1.6E-01	2.9E-08	4.7E-09
PU-238	4.1E-05	8.7E-02	3.9E-08	3.4E-09
PU-239/240	2.7E-05	5.7E-02	3.8E-08	2.2E-09
RA-226	1.1E-02	2.3E+01	7.0E-09	1.6E-07
RA-228	1.4E-03	2.9E+00	6.9E-10	2.0E-09
SR-90	5.7E-04	1.2E+00	6.2E-11	7.4E-11
TC-99	5.1E-02	1.1E+02	8.3E-12	8.8E-10
TH-228	1.6E-03	3.3E+00	7.8E-08	2.6E-07
TH-230	4.9E-03	1.0E+01	2.9E-08	3.0E-07
TH-232	1.4E-03	3.0E+00	1.1E-07	3.3E-07
U-234	3.1E-03	6.5E+00	2.6E-08	1.7E-07
U-235/236	3.2E-04	6.7E-01	2.5E-08	1.7E-08
U-238	3.3E-03	7.0E+00	5.2E-08	3.6E-07
			Total Pathway:	1.6E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.50	2.1E+02	2.8E-11	5.9E-09
NP-237	0.21	9.0E+01	2.2E-10	2.0E-08
PU-238	0.12	4.9E+01	2.2E-10	1.1E-08
PU-239/240	0.08	3.2E+01	2.3E-10	7.3E-09
RA-226	30.80	1.3E+04	7.8E-10	1.0E-05
RA-228	3.88	1.6E+03	1.0E-10	1.6E-07
SR-90	1.60	6.7E+02	3.6E-11	2.4E-08
TC-99	142	6.0E+04	1.3E-12	7.8E-08
TH-228	4.41	1.9E+03	5.5E-11	1.0E-07
TH-230	13.80	5.8E+03	1.3E-11	7.5E-08
TH-232	3.99	1.7E+03	1.7E-10	2.8E-07
U-234	8.66	3.6E+03	1.6E-11	5.8E-08
U-235/236	0.89	3.7E+02	1.6E-11	6.0E-09
U-238	9.31	3.9E+03	2.8E-11	1.1E-07
			Total Pathway:	1.1E-05

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	3.18E-08	1.7E-10		
Aroclor-1260	1.86E-08	1.0E-10		
Arsenic	2.59E-06	1.4E-08	1.5E+01	2.1E-07
Benzo(a)anthracene	1.96E-06	1.1E-08	6.1E-01	6.6E-09
Benzo(a)pyrene	3.36E-06	1.8E-08	6.1E+00	1.1E-07
Benzo(b)fluoranthene	2.21E-06	1.2E-08	6.1E-01	7.4E-09
Benzo(g,h,i)perylene	2.21E-06	1.2E-08		
Benzo(k)fluoranthene	2.61E-06	1.4E-08	6.1E-02	8.7E-10
Beryllium	3.36E-07	1.8E-09	8.4E+00	1.5E-08
Lead	8.78E-06	4.8E-08		
Dibenzo(a,h)anthracene	6.78E-07	3.7E-09	6.1E+00	2.3E-08
Dieldrin	3.57E-09	2.0E-11	1.6E+01	3.1E-10
Indeno(1,2,3-cd)pyrene	2.14E-06	1.2E-08	6.1E-01	7.2E-09
Phenanthrene	8.21E-07	4.5E-09		
TH-Total	1.31E-05	7.2E-08		
			Total Pathway:	3.9E-07
			Total Rad + Chem	2.0E-06

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.09	9.8E-08	7.7E+00	7.5E-07
Aroclor-1260	0.05	5.7E-08	7.7E+00	4.4E-07
Arsenic	7.27	8.0E-06	1.8E+00	1.4E-05
Benzo(a)anthracene	5.50	6.0E-06	7.3E-01	4.4E-06
Benzo(a)pyrene	9.40	1.0E-05	7.3E+00	7.5E-05
Benzo(b)fluoranthene	6.20	6.8E-06	7.3E-01	5.0E-06
Benzo(g,h,i)perylene	6.20	6.8E-06		
Benzo(k)fluoranthene	7.30	8.0E-06	7.3E-02	5.8E-07
Beryllium	0.94	1.0E-06	4.3E+00	4.4E-06
Lead	24.58	2.7E-05		
Dibenzo(a,h)anthracene	1.90	2.1E-06	7.3E+00	1.5E-05
Dieldrin	0.01	1.1E-08	1.6E+01	1.8E-07
Indeno(1,2,3-cd)pyrene	6.00	6.6E-06	7.3E-01	4.8E-06
Phenanthrene	2.30	2.5E-06		
TH-Total	36.70	4.0E-05		
			Total Pathway:	1.2E-04
			Total Rad + Chem	1.4E-04

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TABLE B.3.2-19(b)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	1.6E+00	2.0E-06	3.1E-06	3.1E-06
	NP-237	6.7E-01	4.3E-07	2.9E-07	3.1E-07
	PU-238	3.6E-01	2.8E-11	1.0E-11	1.4E-08
	PU-239/24	2.4E-01	2.7E-11	6.4E-12	9.5E-09
	RA-226	9.6E+01	6.0E-06	5.8E-04	5.9E-04
	RA-228	1.2E+01	2.9E-06	3.5E-05	3.5E-05
	SR-90	5.0E+00			2.4E-08
	TC-99	4.4E+02	6.0E-13	2.7E-10	7.9E-08
	TH-228	1.4E+01	5.6E-06	7.7E-05	7.7E-05
	TH-230	4.3E+01	5.4E-11	2.3E-09	3.8E-07
	TH-232	1.2E+01	8.5E-06	1.1E-04	1.1E-04
	U-234	2.7E+01	3.0E-11	8.1E-10	2.3E-07
	U-235/236	2.8E+00	2.4E-07	6.6E-07	6.9E-07
	U-238	2.9E+01	3.6E-08	1.0E-06	1.5E-06
Total Pathway:			Total Pathway:	8.0E-04	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	5.9E-08	1.0E+01	6.0E-07					1.4E-06
Aroclor-1260	3.4E-08	1.0E+01	3.5E-07					7.9E-07
Arsenic	8.0E-08	1.8E+00	1.5E-07					1.4E-05
Benzo(a)anthracene			4.4E-06					8.8E-06
Benzo(a)pyrene			7.5E-05					1.5E-04
Benzo(b)fluoranthene			5.0E-06					9.9E-06
Benzo(g,h,i)perylene								
Benzo(k)fluoranthene			5.8E-07					1.2E-06
Beryllium			4.4E-06					8.9E-06
Lead	2.7E-06			Not applicable				
Dibenzo(a,h)anthracene			1.5E-05					3.0E-05
Dieldrin	6.6E-09	1.6E+01	1.1E-07					2.8E-07
Indeno(1,2,3-cd)pyrene			4.8E-06					9.6E-06
Phenanthrene	7.6E-06							
TH-Total	4.0E-06							
Total Pathway:			1.1E-04	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.1E-04 8.0E-04 *Total:* 1.0E-03

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TABLE B.3.2-19(b)
(continued)

Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil					Ingestion/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	1.78E-04	3.7E-01			CS-137	0.50	2.1E+02		
NP-237	7.64E-05	1.6E-01			NP-237	0.21	9.0E+01		
PU-238	4.14E-05	8.7E-02			PU-238	0.12	4.9E+01		
PU-239/240	2.71E-05	5.7E-02			PU-239/240	0.08	3.2E+01		
RA-226	1.10E-02	2.3E+01			RA-226	30.80	1.3E+04		
RA-228	1.38E-03	2.9E+00			RA-228	3.88	1.6E+03		
SR-90	5.71E-04	1.2E+00			SR-90	1.60	6.7E+02		
TC-99	5.07E-02	1.1E+02			TC-99	142.00	6.0E+04		
TH-228	1.57E-03	3.3E+00			TH-228	4.41	1.9E+03		
TH-230	4.93E-03	1.0E+01			TH-230	13.80	5.8E+03		
TH-232	1.42E-03	3.0E+00			TH-232	3.99	1.7E+03		
U-234	3.09E-03	6.5E+00			U-234	8.66	3.6E+03		
U-235/236	3.17E-04	6.7E-01			U-235/236	0.89	3.7E+02		
U-238	3.32E-03	7.0E+00			U-238	9.31	3.9E+03		
		Total Pathway:					Total Pathway:		

Chemical Hazard

Inhalation of Particulates/Soil					Ingestion/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard	Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	3.18E-08	2.0E-09			Aroclor-1254	0.09	1.1E-06		
Aroclor-1260	1.86E-08	1.2E-09			Aroclor-1260	0.05	6.6E-07		
Arsenic	2.59E-06	1.7E-07			Arsenic	7.27	9.3E-05	3.0E-04	3.1E-01
Benzo(a)anthracene	1.96E-06	1.3E-07			Benzo(a)anthracene	5.50	7.0E-05		
Benzo(a)pyrene	3.36E-06	2.1E-07			Benzo(a)pyrene	9.40	1.2E-04		
Benzo(b)fluoranthene	2.21E-06	1.4E-07			Benzo(b)fluoranthene	6.20	7.9E-05		
Benzo(g,h,i)perylene	2.21E-06	1.4E-07			Benzo(g,h,i)perylene	6.20	7.9E-05		
Benzo(k)fluoranthene	2.61E-06	1.7E-07			Benzo(k)fluoranthene	7.30	9.3E-05		
Beryllium	3.36E-07	2.1E-08			Beryllium	0.94	1.2E-05	5.0E-03	2.4E-03
Lead	8.78E-06	5.6E-07			Lead	24.58	3.1E-04		
Dibenzo(a,h)anthracene	6.78E-07	4.3E-08			Dibenzo(a,h)anthracene	1.90	2.4E-05		
Dieldrin	3.57E-09	2.3E-10			Dieldrin	0.01	1.3E-07	5.0E-05	2.6E-03
Indeno(1,2,3-cd)pyrene	2.14E-06	1.4E-07			Indeno(1,2,3-cd)pyrene	6.00	7.7E-05		
Phenanthrene	8.21E-07	5.2E-08			Phenanthrene	2.30	2.9E-05		
TH-Total	1.31E-05	8.4E-07			TH-Total	36.70	4.7E-04		
		Total Pathway:					Total Pathway:		3.1E-01
		Total Rad + Chem					Total Rad + Chem		3.1E-01

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TABLE B.3.2-19(b)
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	1.6E+00		
	NP-237	6.7E-01		
	PU-238	3.6E-01		
	PU-239/240	2.4E-01		
	RA-226	9.6E+01		
	RA-228	1.2E+01		
	SR-90	5.0E+00		
	TC-99	4.4E+02		
	TH-228	1.4E+01		
	TH-230	4.3E+01		
	TH-232	1.2E+01		
	U-234	2.7E+01		
	U-235/236	2.8E+00		
	U-238	2.9E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	6.8E-07							
Aroclor-1260	4.0E-07							
Arsenic	9.3E-07	2.9E-04	3.3E-03					3.1E-01
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.4E-04							
Benzo(k)fluoranthene								
Beryllium	1.2E-06	5.0E-05	2.4E-02					2.6E-02
Lead	3.1E-05			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin	7.7E-08	5.0E-05	1.5E-03					4.1E-03
Indeno(1,2,3-cd)pyrene								
Phenanthrene	8.8E-05							
TH-Total	4.7E-05							
Total Pathway:			2.9E-02	Total Pathway:				

Total Rad + Chem 2.9E-02

otal: 3.4E-01

TABLE B.3.2-20(a)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.9E-02	9.3E+02	2.2E-10	2.0E-07
SR-90	2.7E-02	1.3E+03	3.6E-11	4.8E-08
TC-99	1.8E+00	8.9E+04	1.3E-12	1.2E-07
U-234	4.7E+02	2.3E+07	1.6E-11	3.7E-04
U-235/236	2.5E+01	1.2E+06	1.6E-11	2.0E-05
U-238	5.2E+02	2.5E+07	2.8E-11	7.1E-04

Total Pathway: 1.1E-03

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene	7.2E-04	2.0E-05		
Lead	1.4E-03	3.9E-05		
Tributyl phosphate	1.4E-03	3.9E-05		
U-Total	1.8E+00	5.0E-02		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene	7.4E-05		
Lead	1.5E-04		
Tributyl phosphate	1.5E-04		
U-Total	1.9E-01		

Total Pathway:

Total Rad + Chem 1.1E-03

Total Rad + Chem

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TABLE B.3.2-20(a)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	2.0E-07
	4.8E-08
	1.2E-07
	3.7E-04
	2.0E-05
	7.1E-04

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene	8.0E-06		
Lead	4.5E-10		
Tributyl phosphate	3.5E-06		
U-Total	1.4E-04		

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem — *Total:* 1.1E-03

TABLE B.3.2-20(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	1.9E-02	9.3E+02		
SR-90	2.7E-02	1.3E+03		
TC-99	1.8E+00	8.9E+04		
U-234	4.7E+02	2.3E+07		
U-235/236	2.5E+01	1.2E+06		
U-238	5.2E+02	2.5E+07		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene	7.2E-04	2.0E-05		
Lead	1.4E-03	3.9E-05		
Tributyl phosphate	1.4E-03	3.9E-05	5.0E-03	7.8E-03
U-Total	1.8E+00	5.0E-02	3.0E-03	1.7E+01

Total Pathway: 1.7E+01

Total Rad + Chem 1.7E+01

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene	7.4E-05		
Lead	1.5E-04		
Tributyl phosphate	1.5E-04		
U-Total	1.9E-01		

Total Pathway:

Total Rad + Chem

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TABLE B.3.2-20(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
			Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene	8.0E-06			
Lead	4.5E-10			
Tributyl phosphate	3.5E-06	4.5E-03	7.9E-04	8.6E-03
U-Total	1.4E-04	1.5E-04	9.7E-01	1.8E+01
		Total Pathway:	9.7E-01	

Total Rad + Chem 9.7E-01 *Total:* 1.8E+01

TABLE B.3.2-20(b)
FUTURE, ON-PROPERTY CHILD
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.9E-02	4.0E+01	2.2E-10	8.8E-09
SR-90	2.7E-02	5.7E+01	3.6E-11	2.1E-09
TC-99	1.8E+00	3.8E+03	1.3E-12	5.0E-09
U-234	4.7E+02	9.8E+05	1.6E-11	1.6E-05
U-235/236	2.5E+01	5.3E+04	1.6E-11	8.4E-07
U-238	5.2E+02	1.1E+06	2.8E-11	3.0E-05

Total Pathway: 4.7E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene	7.2E-04	3.9E-06		
Lead	1.4E-03	7.8E-06		
Tributyl phosphate	1.4E-03	7.8E-06		
U-Total	1.8E+00	1.0E-02		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene	2.9E-05		
Lead	5.9E-05		
Tributyl phosphate	5.9E-05		
U-Total	7.6E-02		

Total Pathway:

Total Rad + Chem 4.7E-05

Total Rad + Chem

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TABLE B.3.2-20(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	8.8E-09
	2.1E-09
	5.0E-09
	1.6E-05
	8.4E-07
	3.0E-05

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene	1.1E-06		
Lead	6.3E-11		
Tributyl phosphate	4.9E-07		
U-Total	2.0E-05		

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem — *Total:* 4.7E-05

TABLE B.3.2-20(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	1.9E-02	4.0E+01			Not applicable
SR-90	2.7E-02	5.7E+01			
TC-99	1.8E+00	3.8E+03			
U-234	4.7E+02	9.8E+05			
U-235/236	2.5E+01	5.3E+04			
U-238	5.2E+02	1.1E+06			
		Total Pathway:			Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene	7.2E-04	4.6E-05			2-Methylnaphthalene	3.4E-04		
Lead	1.4E-03	9.1E-05			Lead	6.9E-04		
Tributyl phosphate	1.4E-03	9.1E-05	5.0E-03	1.8E-02	Tributyl phosphate	6.9E-04		
U-Total	1.8E+00	1.2E-01	3.0E-03	3.9E+01	U-Total	8.8E-01		
			Total Pathway:	3.9E+01			Total Pathway:	
			Total Rad + Chem	3.9E+01			Total Rad + Chem	

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TABLE B.3.2-20(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	

Total Pathway:

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene	1.3E-05			
Lead	7.3E-10			
Tributyl phosphate	5.7E-06	4.5E-03	1.3E-03	2.0E-02
U-Total	2.4E-04	1.5E-04	1.6E+00	4.1E+01
		Total Pathway:	1.6E+00	

Total Rad + Chem 1.6E+00 *Total:* 4.1E+01

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TABLE B.3.2-21(a)

FUTURE, ON-PROPERTY FARMER (RME VALUES)

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	6.41E-03	1.3E+04	2.8E-11	3.5E-07	CS-137	6.40E-03	6.7E+03	2.8E-11	1.9E-07	5.4E-07
NP-237	9.16E-04	1.8E+03	2.2E-10	4.0E-07	NP-237	9.17E-04	9.6E+02	2.2E-10	2.1E-07	6.1E-07
PU-238	2.23E-06	4.4E+00	2.2E-10	9.7E-10	PU-238	2.80E-06	2.9E+00	2.2E-10	6.4E-10	1.6E-09
PU-239/240	1.46E-06	2.9E+00	2.3E-10	6.6E-10	PU-239/240	1.83E-06	1.9E+00	2.3E-10	4.4E-10	1.1E-09
RA-226	1.98E-02	3.9E+04	7.8E-10	3.0E-05	RA-226	1.99E-02	2.1E+04	7.8E-10	1.6E-05	4.7E-05
RA-228	2.49E-03	4.9E+03	1.0E-10	4.9E-07	RA-228	2.49E-03	2.6E+03	1.0E-10	2.6E-07	7.5E-07
SR-90	1.71E-01	3.4E+05	3.6E-11	1.2E-05	SR-90	1.71E-01	1.8E+05	3.6E-11	6.4E-06	1.9E-05
TC-99	9.12E+01	1.8E+08	1.3E-12	2.3E-04	TC-99	9.12E+01	9.5E+07	1.3E-12	1.2E-04	3.6E-04
TH-228	1.60E-04	3.2E+02	5.5E-11	1.7E-08	TH-228	1.76E-04	1.8E+02	5.5E-11	1.0E-08	2.7E-08
TH-230	5.02E-04	9.9E+02	1.3E-11	1.3E-08	TH-230	5.71E-04	6.0E+02	1.3E-11	7.7E-09	2.1E-08
TH-232	1.45E-04	2.9E+02	1.7E-10	4.9E-08	TH-232	1.65E-04	1.7E+02	1.7E-10	2.9E-08	7.8E-08
U-234	1.48E-02	2.9E+04	1.6E-11	4.7E-07	U-234	1.49E-02	1.6E+04	1.6E-11	2.5E-07	7.2E-07
U-235/236	1.52E-03	3.0E+03	1.6E-11	4.8E-08	U-235/236	1.52E-03	1.6E+03	1.6E-11	2.5E-08	7.3E-08
U-238	1.59E-02	3.1E+04	2.8E-11	8.8E-07	U-238	1.60E-02	1.7E+04	2.8E-11	4.7E-07	1.3E-06
			Total Pathway:	2.8E-04				Total Pathway:	1.5E-04	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.83E-04	5.3E-07	7.7E+00	4.1E-06	Aroclor-1254	4.85E-04	2.8E-07	7.7E+00	2.2E-06	6.3E-06
Aroclor-1260	6.38E-05	7.0E-08	7.7E+00	5.4E-07	Aroclor-1260	6.42E-05	3.7E-08	7.7E+00	2.9E-07	8.3E-07
Arsenic	1.87E-02	2.1E-05	1.8E+00	3.6E-05	Arsenic	1.87E-02	1.1E-05	1.8E+00	1.9E-05	5.5E-05
Benzo(a)anthracene	4.88E-02	5.4E-05	7.3E-01	3.9E-05	Benzo(a)anthracene	4.85E-02	2.8E-05	7.3E-01	2.1E-05	6.0E-05
Benzo(a)pyrene	4.64E-02	5.1E-05	7.3E+00	3.7E-04	Benzo(a)pyrene	4.61E-02	2.7E-05	7.3E+00	2.0E-04	5.7E-04
Benzo(b)fluoranthene	2.98E-02	3.3E-05	7.3E-01	2.4E-05	Benzo(b)fluoranthene	2.96E-02	1.7E-05	7.3E-01	1.3E-05	3.7E-05
Benzo(g,h,i)perylene	6.80E-03	7.5E-06			Benzo(g,h,i)perylene	6.78E-03	4.0E-06			
Benzo(k)fluoranthene	1.35E-02	1.5E-05	7.3E-02	1.1E-06	Benzo(k)fluoranthene	1.35E-02	7.9E-06	7.3E-02	5.7E-07	1.7E-06
Beryllium	6.05E-04	6.7E-07	4.3E+00	2.9E-06	Beryllium	6.10E-04	3.6E-07	4.3E+00	1.5E-06	4.4E-06
Lead	6.41E-02	7.1E-05			Lead	6.42E-02	3.7E-05			
Dibenzo(a,h)anthracen	3.50E-03	3.9E-06	7.3E+00	2.8E-05	Dibenzo(a,h)anthracen	3.50E-03	2.0E-06	7.3E+00	1.5E-05	4.3E-05
Dieldrin	9.35E-03	1.0E-05	1.6E+01	1.6E-04	Dieldrin	9.35E-03	5.5E-06	1.6E+01	8.7E-05	2.5E-04
Indeno(1,2,3-cd)pyren	1.56E-02	1.7E-05	7.3E-01	1.3E-05	Indeno(1,2,3-cd)pyren	1.56E-02	9.1E-06	7.3E-01	6.6E-06	1.9E-05
Phenanthrene	8.70E-02	9.6E-05			Phenanthrene	8.48E-02	4.9E-05			
TH-Total	1.34E-03	1.5E-06			TH-Total	1.52E-03	8.9E-07			
			Total Pathway:	6.9E-04				Total Pathway:	3.6E-04	
			Total Rad + Chem	9.7E-04				Total Rad + Chem	5.1E-04	*Total:* 1.5E-03

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TABLE B.3.2-21(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	6.4E-03	1.3E+04			CS-137	6.40E-03	6.7E+03			
NP-237	9.2E-04	1.8E+03			NP-237	9.17E-04	9.6E+02			
PU-238	2.2E-06	4.4E+00			PU-238	2.80E-06	2.9E+00			
PU-239/240	1.5E-06	2.9E+00			PU-239/240	1.83E-06	1.9E+00			
RA-226	2.0E-02	3.9E+04			RA-226	1.99E-02	2.1E+04			
RA-228	2.5E-03	4.9E+03			RA-228	2.49E-03	2.6E+03			
SR-90	1.7E-01	3.4E+05			SR-90	1.71E-01	1.8E+05			
TC-99	9.1E+01	1.8E+08			TC-99	9.12E+01	9.5E+07			
TH-228	1.6E-04	3.2E+02			TH-228	1.76E-04	1.8E+02			
TH-230	5.0E-04	9.9E+02			TH-230	5.71E-04	6.0E+02			
TH-232	1.5E-04	2.9E+02			TH-232	1.65E-04	1.7E+02			
U-234	1.5E-02	2.9E+04			U-234	1.49E-02	1.6E+04			
U-235/236	1.5E-03	3.0E+03			U-235/236	1.52E-03	1.6E+03			
U-238	1.6E-02	3.1E+04			U-238	1.60E-02	1.7E+04			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.8E-04	5.3E-07			Aroclor-1254	4.85E-04	2.8E-07			
Aroclor-1260	6.4E-05	7.0E-08			Aroclor-1260	6.42E-05	3.7E-08			
Arsenic	1.9E-02	2.1E-05	3.0E-04	6.9E-02	Arsenic	1.87E-02	1.1E-05	3.0E-04	3.6E-02	1.0E-01
Benzo(a)anthracene	4.9E-02	5.4E-05			Benzo(a)anthracene	4.85E-02	2.8E-05			
Benzo(a)pyrene	4.6E-02	5.1E-05			Benzo(a)pyrene	4.61E-02	2.7E-05			
Benzo(b)fluoranthene	3.0E-02	3.3E-05			Benzo(b)fluoranthene	2.96E-02	1.7E-05			
Benzo(g,h,i)perylene	6.8E-03	7.5E-06			Benzo(g,h,i)perylene	6.78E-03	4.0E-06			
Benzo(k)fluoranthene	1.3E-02	1.5E-05			Benzo(k)fluoranthene	1.35E-02	7.9E-06			
Beryllium	6.0E-04	6.7E-07	5.0E-03	1.3E-04	Beryllium	6.10E-04	3.6E-07	5.0E-03	7.1E-05	2.0E-04
Lead	6.4E-02	7.1E-05			Lead	6.42E-02	3.7E-05			
Dibenzo(a,h)anthracen	3.5E-03	3.9E-06			Dibenzo(a,h)anthracen	3.50E-03	2.0E-06			
Dieldrin	9.4E-03	1.0E-05	5.0E-05	2.1E-01	Dieldrin	9.35E-03	5.5E-06	5.0E-05	1.1E-01	3.2E-01
Indeno(1,2,3-cd)pyren	1.6E-02	1.7E-05			Indeno(1,2,3-cd)pyren	1.56E-02	9.1E-06			
Phenanthrene	8.7E-02	9.6E-05			Phenanthrene	8.48E-02	4.9E-05			
TH-Total	1.3E-03	1.5E-06			TH-Total	1.52E-03	8.9E-07			
			Total Pathway:	2.7E-01				Total Pathway:	1.5E-01	
			Total Rad + Chem	2.7E-01				Total Rad + Chem	1.5E-01	*Total:* 4.2E-01

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TABLE B.3.2-21(a)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			5.4E-07
NP-237	9.41E-05	1.9E+02	2.2E-10	4.1E-08	NP-237	9.41E-05	9.8E+01	2.2E-10	2.2E-08	6.24E-08	6.7E-07
PU-238			2.2E-10		PU-238			2.2E-10			1.6E-09
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.1E-09
RA-226			7.8E-10		RA-226			7.8E-10			4.7E-05
RA-228			1.0E-10		RA-228			1.0E-10			7.5E-07
SR-90	1.53E-04	3.0E+02	3.6E-11	1.09E-08	SR-90	1.53E-04	1.6E+02	3.6E-11	5.75E-09	1.66E-08	1.9E-05
TC-99	9.50E-03	1.9E+04	1.3E-12	2.4E-08	TC-99	9.50E-03	9.9E+03	1.3E-12	1.3E-08	3.72E-08	3.6E-04
TH-228			5.5E-11		TH-228			5.5E-11			2.7E-08
TH-230			1.3E-11		TH-230			1.3E-11			2.1E-08
TH-232			1.7E-10		TH-232			1.7E-10			7.8E-08
U-234	2.30E+00	4.5E+06	1.6E-11	7.2E-05	U-234	2.30E+00	2.4E+06	1.6E-11	3.8E-05	1.11E-04	1.1E-04
U-235/236	1.23E-01	2.4E+05	1.6E-11	3.9E-06	U-235/236	1.23E-01	1.3E+05	1.6E-11	2.0E-06	5.91E-06	6.0E-06
U-238	2.53E+00	5.0E+06	2.8E-11	1.4E-04	U-238	2.53E+00	2.6E+06	2.8E-11	7.4E-05	2.14E-04	2.2E-04
		Total Pathway:		2.2E-04			Total Pathway:		1.1E-04		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit				
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00	
Arsenic			1.8E+00		Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02		Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00		Beryllium			4.3E+00	
Lead	7.39E-03	8.1E-06			Lead	7.39E-03	4.3E-06		
Dibenzo(a,h)anthrac			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01		Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyr			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01	
Phenanthrene					Phenanthrene				
TH-Total					TH-Total				
2-Methylnaphthalene	3.53E-03	3.9E-06			2-Methylnaphthalene	3.53E-03	2.1E-06		
Tributyl phosphate	7.43E-03	8.2E-06			Tributyl phosphate	7.43E-03	4.3E-06		
U-Total	9.00E+00	9.9E-03			U-Total	9.00E+00	5.3E-03		
		Total Pathway:					Total Pathway:		

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Total:	3.31E-04	1.8E-03

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TABLE B.3.2-21(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	9.4E-05	1.9E+02		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.5E-04	3.0E+02		
TC-99	9.5E-03	1.9E+04		
TH-228				
TH-230				
TH-232				
U-234	2.3E+00	4.5E+06		
U-235/236	1.2E-01	2.4E+05		
U-238	2.5E+00	5.0E+06		
		Total Pathway:		

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	9.41E-05	9.8E+01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.53E-04	1.6E+02		
TC-99	9.50E-03	9.9E+03		
TH-228				
TH-230				
TH-232				
U-234	2.30E+00	2.4E+06		
U-235/236	1.23E-01	1.3E+05		
U-238	2.53E+00	2.6E+06		
		Total Pathway:		

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	7.4E-03	8.1E-06		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene	3.5E-03	3.9E-06		
Tributyl phosphate	7.4E-03	8.2E-06	5.0E-03	1.6E-03
U-Total	9.0E+00	9.9E-03	3.0E-03	3.3E+00
			Total Pathway:	3.3E+00

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	7.39E-03	4.3E-06		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyren				
Phenanthrene				
TH-Total				
2-Methylnaphthalene	3.53E-03	2.1E-06		
Tributyl phosphate	7.43E-03	4.3E-06	5.0E-03	8.7E-04
U-Total	9.00E+00	5.3E-03	3.0E-03	1.8E+00
			Total Pathway:	1.8E+00

Total	Total Dust & Groundwater Affected
	1.0E-01
	2.0E-04
	3.2E-01
2.5E-03	3.2E-01
5.1E+00	5.1E+00

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Total Rad + Chem 3.3E+00

Total Rad + Chem 1.8E+00

Total:	5.1E+00	5.8E+00

TABLE B.3.2-21(b)

FUTURE, ON-PROPERTY CHILD

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	6.41E-03	5.4E+02	2.8E-11	1.5E-08	CS-137	6.40E-03	8.2E+02	2.8E-11	2.3E-08	3.8E-08
NP-237	9.16E-04	7.7E+01	2.2E-10	1.7E-08	NP-237	9.17E-04	1.2E+02	2.2E-10	2.6E-08	4.3E-08
PU-238	2.23E-06	1.9E-01	2.2E-10	4.1E-11	PU-238	2.80E-06	3.6E-01	2.2E-10	7.9E-11	1.2E-10
PU-239/240	1.46E-06	1.2E-01	2.3E-10	2.8E-11	PU-239/240	1.83E-06	2.4E-01	2.3E-10	5.4E-11	8.2E-11
RA-226	1.98E-02	1.7E+03	7.8E-10	1.3E-06	RA-226	1.99E-02	2.6E+03	7.8E-10	2.0E-06	3.3E-06
RA-228	2.49E-03	2.1E+02	1.0E-10	2.1E-08	RA-228	2.49E-03	3.2E+02	1.0E-10	3.2E-08	5.3E-08
SR-90	1.71E-01	1.4E+04	3.6E-11	5.2E-07	SR-90	1.71E-01	2.2E+04	3.6E-11	7.9E-07	1.3E-06
TC-99	9.12E+01	7.7E+06	1.3E-12	1.0E-05	TC-99	9.12E+01	1.2E+07	1.3E-12	1.5E-05	2.5E-05
TH-228	1.60E-04	1.3E+01	5.5E-11	7.4E-10	TH-228	1.76E-04	2.3E+01	5.5E-11	1.2E-09	2.0E-09
TH-230	5.02E-04	4.2E+01	1.3E-11	5.5E-10	TH-230	5.71E-04	7.3E+01	1.3E-11	9.5E-10	1.5E-09
TH-232	1.45E-04	1.2E+01	1.7E-10	2.1E-09	TH-232	1.65E-04	2.1E+01	1.7E-10	3.6E-09	5.7E-09
U-234	1.48E-02	1.2E+03	1.6E-11	2.0E-08	U-234	1.49E-02	1.9E+03	1.6E-11	3.1E-08	5.0E-08
U-235/236	1.52E-03	1.3E+02	1.6E-11	2.0E-09	U-235/236	1.52E-03	2.0E+02	1.6E-11	3.1E-09	5.2E-09
U-238	1.59E-02	1.3E+03	2.8E-11	3.7E-08	U-238	1.60E-02	2.1E+03	2.8E-11	5.8E-08	9.5E-08
			Total Pathway:	1.2E-05				Total Pathway:	1.8E-05	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.83E-04	1.1E-07	7.7E+00	8.1E-07	Aroclor-1254	4.85E-04	1.6E-07	7.7E+00	1.3E-06	2.1E-06
Aroclor-1260	6.38E-05	1.4E-08	7.7E+00	1.1E-07	Aroclor-1260	6.42E-05	2.2E-08	7.7E+00	1.7E-07	2.7E-07
Arsenic	1.87E-02	4.1E-06	1.8E+00	7.2E-06	Arsenic	1.87E-02	6.3E-06	1.8E+00	1.1E-05	1.8E-05
Benzo(a)anthracene	4.88E-02	1.1E-05	7.3E-01	7.8E-06	Benzo(a)anthracene	4.85E-02	1.6E-05	7.3E-01	1.2E-05	2.0E-05
Benzo(a)pyrene	4.64E-02	1.0E-05	7.3E+00	7.4E-05	Benzo(a)pyrene	4.61E-02	1.5E-05	7.3E+00	1.1E-04	1.9E-04
Benzo(b)fluoranthene	2.98E-02	6.5E-06	7.3E-01	4.8E-06	Benzo(b)fluoranthene	2.96E-02	9.9E-06	7.3E-01	7.2E-06	1.2E-05
Benzo(g,h,i)perylene	6.80E-03	1.5E-06			Benzo(g,h,i)perylene	6.78E-03	2.3E-06			
Benzo(k)fluoranthene	1.35E-02	3.0E-06	7.3E-02	2.2E-07	Benzo(k)fluoranthene	1.35E-02	4.5E-06	7.3E-02	3.3E-07	5.5E-07
Beryllium	6.05E-04	1.3E-07	4.3E+00	5.7E-07	Beryllium	6.10E-04	2.0E-07	4.3E+00	8.8E-07	1.4E-06
Lead	6.41E-02	1.4E-05			Lead	6.42E-02	2.2E-05			
Dibenzo(a,h)anthracen	3.50E-03	7.7E-07	7.3E+00	5.6E-06	Dibenzo(a,h)anthracen	3.50E-03	1.2E-06	7.3E+00	8.6E-06	1.4E-05
Dieldrin	9.35E-03	2.1E-06	1.6E+01	3.3E-05	Dieldrin	9.35E-03	3.1E-06	1.6E+01	5.0E-05	8.3E-05
Indeno(1,2,3-cd)pyren	1.56E-02	3.4E-06	7.3E-01	2.5E-06	Indeno(1,2,3-cd)pyren	1.56E-02	5.2E-06	7.3E-01	3.8E-06	6.3E-06
Phenanthrene	8.70E-02	1.9E-05			Phenanthrene	8.48E-02	2.8E-05			
TH-Total	1.34E-03	2.9E-07			TH-Total	1.52E-03	5.1E-07			
			Total Pathway:	1.4E-04				Total Pathway:	2.1E-04	
			Total Rad + Chem	1.5E-04				Total Rad + Chem	2.3E-04	*Total:* 3.7E-04

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TABLE B.3.2-21(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	6.4E-03	5.4E+02			CS-137	6.40E-03	8.2E+02			
NP-237	9.2E-04	7.7E+01			NP-237	9.17E-04	1.2E+02			
PU-238	2.2E-06	1.9E-01			PU-238	2.80E-06	2.9E-01			
PU-239/240	1.5E-06	1.2E-01			PU-239/240	1.83E-06	1.9E-01			
RA-226	2.0E-02	1.7E+03			RA-226	1.99E-02	2.5E+03			
RA-228	2.5E-03	2.1E+02			RA-228	2.49E-03	3.2E+02			
SR-90	1.7E-01	1.4E+04			SR-90	1.71E-01	2.2E+04			
TC-99	9.1E+01	7.7E+06			TC-99	9.12E+01	1.2E+07			
TH-228	1.6E-04	1.3E+01			TH-228	1.76E-04	2.1E+01			
TH-230	5.0E-04	4.2E+01			TH-230	5.71E-04	6.5E+01			
TH-232	1.5E-04	1.2E+01			TH-232	1.65E-04	1.9E+01			
U-234	1.5E-02	1.2E+03			U-234	1.49E-02	1.9E+03			
U-235/236	1.5E-03	1.3E+02			U-235/236	1.52E-03	2.0E+02			
U-238	1.6E-02	1.3E+03			U-238	1.60E-02	2.0E+03			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.8E-04	1.2E-06			Aroclor-1254	4.85E-04	1.9E-06			
Aroclor-1260	6.4E-05	1.6E-07			Aroclor-1260	6.42E-05	2.5E-07			
Arsenic	1.9E-02	4.8E-05	3.0E-04	1.6E-01	Arsenic	1.87E-02	7.3E-05	3.0E-04	2.4E-01	4.0E-01
Benzo(a)anthracene	4.9E-02	1.2E-04			Benzo(a)anthracene	4.85E-02	1.9E-04			
Benzo(a)pyrene	4.6E-02	1.2E-04			Benzo(a)pyrene	4.61E-02	1.8E-04			
Benzo(b)fluoranthene	3.0E-02	7.6E-05			Benzo(b)fluoranthene	2.96E-02	1.2E-04			
Benzo(g,h,i)perylene	6.8E-03	1.7E-05			Benzo(g,h,i)perylene	6.78E-03	2.7E-05			
Benzo(k)fluoranthene	1.3E-02	3.4E-05			Benzo(k)fluoranthene	1.35E-02	5.3E-05			
Beryllium	6.0E-04	1.5E-06	5.0E-03	3.1E-04	Beryllium	6.10E-04	2.4E-06	5.0E-03	4.8E-04	7.9E-04
Lead	6.4E-02	1.6E-04			Lead	6.42E-02	2.5E-04			
Dibenzo(a,h)anthracen	3.5E-03	9.0E-06			Dibenzo(a,h)anthracen	3.50E-03	1.4E-05			
Dieldrin	9.4E-03	2.4E-05	5.0E-05	4.8E-01	Dieldrin	9.35E-03	3.7E-05	5.0E-05	7.3E-01	1.2E+00
Indeno(1,2,3-cd)pyren	1.6E-02	4.0E-05			Indeno(1,2,3-cd)pyren	1.56E-02	6.1E-05			
Phenanthrene	8.7E-02	2.2E-04			Phenanthrene	8.48E-02	3.3E-04			
TH-Total	1.3E-03	3.4E-06			TH-Total	1.52E-03	5.9E-06			
		Total Pathway:		6.4E-01			Total Pathway:		9.8E-01	
		Total Rad + Chem		6.4E-01			Total Rad + Chem		9.8E-01	*Total:* 1.6E+00

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TABLE B.3.2-21(b)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	9.41E-05	7.9E+00	2.2E-10	1.7E-09
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	1.53E-04	1.3E+01	3.6E-11	4.6E-10
TC-99	9.50E-03	8.0E+02	1.3E-12	1.0E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.30E+00	1.9E+05	1.6E-11	3.1E-06
U-235/236	1.23E-01	1.0E+04	1.6E-11	1.6E-07
U-238	2.53E+00	2.1E+05	2.8E-11	6.0E-06
			Total Pathway:	9.2E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	9.41E-05	1.2E+01	2.2E-10	2.7E-09
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	1.53E-04	2.0E+01	3.6E-11	7.1E-10
TC-99	9.50E-03	1.2E+03	1.3E-12	1.6E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.30E+00	3.0E+05	1.6E-11	4.7E-06
U-235/236	1.23E-01	1.6E+04	1.6E-11	2.5E-07
U-238	2.53E+00	3.3E+05	2.8E-11	9.1E-06
			Total Pathway:	1.4E-05

Total	Total Dust & Groundwater Affected
	3.8E-08
4.4E-09	4.7E-08
	1.2E-10
	8.2E-11
	3.3E-06
	5.3E-08
1.2E-09	1.3E-06
2.6E-09	2.5E-05
	2.0E-09
	1.5E-09
	5.7E-09
7.8E-06	7.9E-06
4.2E-07	4.2E-07
1.5E-05	1.5E-05

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02	
Beryllium			4.3E+00	
Lead	7.39E-03	1.6E-06		
Dibenzo(a,h)anthrac			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene	3.53E-03	7.7E-07		
Tributyl phosphate	7.43E-03	1.6E-06		
U-Total	9.00E+00	2.0E-03		
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	7.39E-03	2.5E-06		
Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene	3.53E-03	1.2E-06		
Tributyl phosphate	7.43E-03	2.5E-06		
U-Total	9.00E+00	3.0E-03		
			Total Pathway:	

2.1E-06			
2.7E-07			
1.8E-05			
2.0E-05			
1.9E-04			
1.2E-05			
5.5E-07			
1.4E-06			
1.4E-05			
8.3E-05			
6.3E-06			

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Total Rad + Chem 9.2E-06

Total Rad + Chem 1.4E-05 | *Total:* 2.3E-05 | 4.0E-04

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TABLE B.3.2-21(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	9.4E-05	7.9E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.5E-04	1.3E+01		
TC-99	9.5E-03	8.0E+02		
TH-228				
TH-230				
TH-232				
U-234	2.3E+00	1.9E+05		
U-235/236	1.2E-01	1.0E+04		
U-238	2.5E+00	2.1E+05		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	9.41E-05	1.2E+01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.53E-04	2.0E+01		
TC-99	9.50E-03	1.2E+03		
TH-228				
TH-230				
TH-232				
U-234	2.30E+00	3.0E+05		
U-235/236	1.23E-01	1.6E+04		
U-238	2.53E+00	3.3E+05		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	7.4E-03	1.9E-05		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
2-Methylnaphthalene	3.5E-03	9.0E-06		
Tributyl phosphate	7.4E-03	1.9E-05	5.0E-03	3.8E-03
U-Total	9.0E+00	2.3E-02	3.0E-03	7.7E+00

Total Pathway: 7.7E+00

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	7.39E-03	2.9E-05		
Dibenzo(a,h)anthracen				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
2-Methylnaphthalene	3.53E-03	1.4E-05		
Tributyl phosphate	7.43E-03	2.9E-05	5.0E-03	5.8E-03
U-Total	9.00E+00	3.5E-02	3.0E-03	1.2E+01

Total Pathway: 1.2E+01

Total	Total Dust & Groundwater Affected
	4.0E-01
	7.9E-04
	1.2E+00
9.6E-03	1.2E+00
1.9E+01	1.9E+01

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Total Rad + Chem 7.7E+00

Total Rad + Chem 1.2E+01

Total:	1.9E+01	2.2E+01

TABLE B.3.2-22(a)
FUTURE ON-PROPERTY FARMER (RME VALUES)
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	4.48E+01	8.2E+04	2.8E-11	2.3E-06	CS-137	1.57E+01	1.2E+05	2.8E-11	3.2E-06	5.5E-06
NP-237	6.47E-02	1.2E+02	2.2E-10	2.6E-08	NP-237	5.89E-03	4.3E+01	2.2E-10	9.5E-09	3.6E-08
PU-238	3.03E-05	5.6E-02	2.2E-10	1.2E-11	PU-238	6.07E-06	4.5E-02	2.2E-10	9.8E-12	2.2E-11
PU-239/240	1.99E-05	3.7E-02	2.3E-10	8.4E-12	PU-239/240	3.97E-06	2.9E-02	2.3E-10	6.7E-12	1.5E-11
RA-226	9.63E+00	1.8E+04	7.8E-10	1.4E-05	RA-226	1.73E+01	1.3E+05	7.8E-10	9.9E-05	1.1E-04
RA-228	1.19E+00	2.2E+03	1.0E-10	2.2E-07	RA-228	2.16E+00	1.6E+04	1.0E-10	1.6E-06	1.8E-06
SR-90	6.00E+01	1.1E+05	3.6E-11	4.0E-06	SR-90	3.00E+02	2.2E+06	3.6E-11	7.9E-05	8.3E-05
TC-99	5.74E+05	1.1E+09	1.3E-12	1.4E-03	TC-99	6.75E+05	5.0E+09	1.3E-12	6.5E-03	7.8E-03
TH-228	1.40E-02	2.6E+01	5.5E-11	1.4E-09	TH-228	1.19E-02	8.8E+01	5.5E-11	4.8E-09	6.2E-09
TH-230	4.50E-02	8.3E+01	1.3E-11	1.1E-09	TH-230	3.75E-02	2.8E+02	1.3E-11	3.6E-09	4.7E-09
TH-232	1.30E-02	2.4E+01	1.7E-10	4.1E-09	TH-232	1.08E-02	8.0E+01	1.7E-10	1.4E-08	1.8E-08
U-234	1.60E+00	2.9E+03	1.6E-11	4.7E-08	U-234	4.81E+00	3.5E+04	1.6E-11	5.7E-07	6.1E-07
U-235/236	1.64E-01	3.0E+02	1.6E-11	4.8E-09	U-235/236	4.93E-01	3.6E+03	1.6E-11	5.8E-08	6.3E-08
U-238	1.72E+00	3.2E+03	2.8E-11	8.9E-08	U-238	5.17E+00	3.8E+04	2.8E-11	1.1E-06	1.2E-06
			Total Pathway:	1.4E-03				Total Pathway:	6.6E-03	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	2.72E-03	2.8E-06	7.7E+00	2.1E-05	Aroclor-1254	8.59E-04	3.5E-06	7.7E+00	2.7E-05	4.9E-05
Aroclor-1260	1.18E-02	1.2E-05	7.7E+00	9.3E-05	Aroclor-1260	3.73E-03	1.5E-05	7.7E+00	1.2E-04	2.1E-04
Arsenic	3.64E-02	3.7E-05	1.8E+00	6.5E-05	Arsenic	1.09E-03	4.5E-06	1.8E+00	7.8E-06	7.3E-05
Benzo(a)anthracene	9.59E-02	9.9E-05	7.3E-01	7.2E-05	Benzo(a)anthracene	3.05E-02	1.3E-04	7.3E-01	9.1E-05	1.6E-04
Benzo(a)pyrene	3.17E-01	3.3E-04	7.3E+00	2.4E-03	Benzo(a)pyrene	1.01E-01	4.1E-04	7.3E+00	3.0E-03	5.4E-03
Benzo(b)fluoranthene	2.15E-01	2.2E-04	7.3E-01	1.6E-04	Benzo(b)fluoranthene	6.85E-02	2.8E-04	7.3E-01	2.1E-04	3.7E-04
Benzo(g,h,i)perylene	1.65E+00	1.7E-03			Benzo(g,h,i)perylene	5.25E-01	2.2E-03			
Benzo(k)fluoranthene	9.06E-01	9.3E-04	7.3E-02	6.8E-05	Benzo(k)fluoranthene	2.87E-01	1.2E-03	7.3E-02	8.6E-05	1.5E-04
Beryllium	9.43E-04	9.7E-07	4.3E+00	4.2E-06	Beryllium	8.48E-07	3.5E-09	4.3E+00	1.5E-08	4.2E-06
Lead	5.94E-03	6.1E-06			Lead	4.95E-03	2.0E-05			
Dibenzo(a,h)anthracene	2.35E-01	2.4E-04	7.3E+00	1.8E-03	Dibenzo(a,h)anthracene	7.45E-02	3.1E-04	7.3E+00	2.2E-03	4.0E-03
Dieldrin	3.99E-06	4.1E-09	1.6E+01	6.6E-08	Dieldrin	1.26E-06	5.2E-09	1.6E+01	8.3E-08	1.5E-07
Indeno(1,2,3-cd)pyrene	4.57E-01	4.7E-04	7.3E-01	3.4E-04	Indeno(1,2,3-cd)pyrene	1.45E-01	6.0E-04	7.3E-01	4.4E-04	7.8E-04
Phenanthrene	1.00E-02	1.0E-05			Phenanthrene	3.22E-03	1.3E-05			
TH-Total	1.20E-04	1.2E-07			TH-Total	9.96E-05	4.1E-07			
			Total Pathway:	5.0E-03				Total Pathway:	6.2E-03	
			Total Rad + Chem	6.4E-03				Total Rad + Chem	1.3E-02	*Total:* 1.9E-02

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TABLE B.3.2-22(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.5E+01	8.2E+04		
NP-237	6.5E-02	1.2E+02		
PU-238	3.0E-05	5.6E-02		
PU-239/240	2.0E-05	3.7E-02		
RA-226	9.6E+00	1.8E+04		
RA-228	1.2E+00	2.2E+03		
SR-90	6.0E+01	1.1E+05		
TC-99	5.7E+05	1.1E+09		
TH-228	1.4E-02	2.6E+01		
TH-230	4.5E-02	8.3E+01		
TH-232	1.3E-02	2.4E+01		
U-234	1.6E+00	2.9E+03		
U-235/236	1.6E-01	3.0E+02		
U-238	1.7E+00	3.2E+03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	1.57E+01	1.2E+05		
NP-237	5.89E-03	4.3E+01		
PU-238	6.07E-06	4.5E-02		
PU-239/240	3.97E-06	2.9E-02		
RA-226	1.73E+01	1.3E+05		
RA-228	2.16E+00	1.6E+04		
SR-90	3.00E+02	2.2E+06		
TC-99	6.75E+05	5.0E+09		
TH-228	1.19E-02	8.8E+01		
TH-230	3.75E-02	2.8E+02		
TH-232	1.08E-02	8.0E+01		
U-234	4.81E+00	3.5E+04		
U-235/236	4.93E-01	3.6E+03		
U-238	5.17E+00	3.8E+04		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	2.7E-03	2.8E-06		
Aroclor-1260	1.2E-02	1.2E-05		
Arsenic	3.6E-02	3.7E-05	3.0E-04	1.2E-01
Benzo(a)anthracene	9.6E-02	9.9E-05		
Benzo(a)pyrene	3.2E-01	3.3E-04		
Benzo(b)fluoranthene	2.2E-01	2.2E-04		
Benzo(g,h,i)perylene	1.7E+00	1.7E-03		
Benzo(k)fluoranthene	9.1E-01	9.3E-04		
Beryllium	9.4E-04	9.7E-07	5.0E-03	1.9E-04
Lead	5.9E-03	6.1E-06		
Dibenzo(a,h)anthracene	2.3E-01	2.4E-04		
Dieldrin	4.0E-06	4.1E-09	5.0E-05	8.2E-05
Indeno(1,2,3-cd)pyrene	4.6E-01	4.7E-04		
Phenanthrene	1.0E-02	1.0E-05		
TH-Total	1.2E-04	1.2E-07		

Total Pathway: 1.2E-01

Total Rad + Chem 1.2E-01

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254	8.6E-04	3.5E-06		
Aroclor-1260	3.7E-03	1.5E-05		
Arsenic	1.1E-03	4.5E-06	3.0E-04	1.5E-02
Benzo(a)anthracene	3.0E-02	1.3E-04		
Benzo(a)pyrene	1.0E-01	4.1E-04		
Benzo(b)fluoranthene	6.8E-02	2.8E-04		
Benzo(g,h,i)perylene	5.2E-01	2.2E-03		
Benzo(k)fluoranthene	2.9E-01	1.2E-03		
Beryllium	8.5E-07	3.5E-09	5.0E-03	7.0E-07
Lead	4.9E-03	2.0E-05		
Dibenzo(a,h)anthracene	7.5E-02	3.1E-04		
Dieldrin	1.3E-06	5.2E-09	5.0E-05	1.0E-04
Indeno(1,2,3-cd)pyrene	1.5E-01	6.0E-04		
Phenanthrene	3.2E-03	1.3E-05		
TH-Total	1.0E-04	4.1E-07		

Total Pathway: 1.5E-02

Total Rad + Chem 1.5E-02

Total	
	1.4E-01
	1.9E-04
	1.9E-04
Total:	1.4E-01

TABLE B.3.2-22(a)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			5.5E-06
NP-237	3.41E-04	6.3E-01	2.2E-10	1.4E-10	NP-237	3.19E-05	2.3E-01	2.2E-10	5.2E-11	1.9E-10	3.6E-08
PU-238			2.2E-10		PU-238			2.2E-10			2.2E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.5E-11
RA-226			7.8E-10		RA-226			7.8E-10			1.1E-04
RA-228			1.0E-10		RA-228			1.0E-10			1.8E-06
SR-90	5.88E-03	1.1E+01	3.6E-11	3.9E-10	SR-90	2.99E-02	2.2E+02	3.6E-11	7.9E-09	8.3E-09	8.3E-05
TC-99	6.36E+00	1.2E+04	1.3E-12	1.5E-08	TC-99	7.66E+00	5.6E+04	1.3E-12	7.3E-08	8.8E-08	7.8E-03
TH-228			5.5E-11		TH-228			5.5E-11			6.2E-09
TH-230			1.3E-11		TH-230			1.3E-11			4.7E-09
TH-232			1.7E-10		TH-232			1.7E-10			1.8E-08
U-234	2.74E+01	5.0E+04	1.6E-11	8.0E-07	U-234	8.49E+01	6.2E+05	1.6E-11	1.0E-05	1.1E-05	1.1E-05
U-235/236	1.46E+00	2.7E+03	1.6E-11	4.3E-08	U-235/236	4.53E+00	3.3E+04	1.6E-11	5.3E-07	5.8E-07	6.4E-07
U-238	3.02E+01	5.5E+04	2.8E-11	1.6E-06	U-238	9.36E+01	6.9E+05	2.8E-11	1.9E-05	2.1E-05	2.2E-05
			Total Pathway:	2.4E-06				Total Pathway:	3.0E-05		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			4.9E-05
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			2.1E-04
Arsenic			1.8E+00		Arsenic			1.8E+00			7.3E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			1.6E-04
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			5.4E-03
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			3.7E-04
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02			
Beryllium			4.3E+00		Beryllium			4.3E+00			4.2E-06
Lead	1.32E-04	1.4E-07			Lead	1.13E-04	4.7E-07				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			4.0E-03
Dieldrin			1.6E+01		Dieldrin			1.6E+01			1.5E-07
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			7.8E-04
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.82E-05	3.9E-08			2-Methylnaphthalene	1.25E-05	5.1E-08				
Tributyl phosphate	3.53E-02	3.6E-05			Tributyl phosphate	4.56E-04	1.9E-06				
U-Total	3.38E-03	3.5E-06			U-Total	1.10E-03	4.5E-06				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	2.4E-06				Total Rad + Chem	3.0E-05	*Total:* 3.2E-05	1.9E-02

TABLE B.3.2-22(a)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	3.4E-04	6.3E-01			NP-237	3.19E-05	2.3E-01				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	5.9E-03	1.1E+01			SR-90	2.99E-02	2.2E+02				
TC-99	6.4E+00	1.2E+04			TC-99	7.66E+00	5.6E+04				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	2.7E+01	5.0E+04			U-234	8.49E+01	6.2E+05				
U-235/236	1.5E+00	2.7E+03			U-235/236	4.53E+00	3.3E+04				
U-238	3.0E+01	5.5E+04			U-238	9.36E+01	6.9E+05				
Total Pathway:											

Chemical Hazard

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			1.4E-01
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			1.9E-04
Lead	1.3E-04	1.4E-07			Lead	1.1E-04	4.7E-07				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			1.9E-04
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.8E-05	3.9E-08			2-Methylnaphthalene	1.2E-05	5.1E-08				
Tributyl phosphate	3.5E-02	3.6E-05	5.0E-03	7.3E-03	Tributyl phosphate	4.6E-04	1.9E-06	5.0E-03	3.7E-04	7.6E-03	7.6E-03
U-Total	3.4E-03	3.5E-06	3.0E-03	1.2E-03	U-Total	1.1E-03	4.5E-06	3.0E-03	1.5E-03	2.7E-03	2.7E-03
			Total Pathway:	8.4E-03				Total Pathway:	1.9E-03		
			Total Rad + Chem	8.4E-03				Total Rad + Chem	1.9E-03	*Total:* 1.0E-02	1.5E-01

TABLE B.3.2-22(b)
FUTURE ON-PROPERTY CHILD
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	4.48E+01	2.7E+03	2.8E-11	7.6E-08	CS-137	1.57E+01	2.2E+04	2.8E-11	6.3E-07	7.0E-07
NP-237	6.47E-02	3.9E+00	2.2E-10	8.7E-10	NP-237	5.89E-03	8.4E+00	2.2E-10	1.8E-09	2.7E-09
PU-238	3.03E-05	1.8E-03	2.2E-10	4.1E-13	PU-238	6.07E-06	8.7E-03	2.2E-10	1.9E-12	2.3E-12
PU-239/240	1.99E-05	1.2E-03	2.3E-10	2.8E-13	PU-239/240	3.97E-06	5.7E-03	2.3E-10	1.3E-12	1.6E-12
RA-226	9.63E+00	5.9E+02	7.8E-10	4.6E-07	RA-226	1.73E+01	2.5E+04	7.8E-10	1.9E-05	2.0E-05
RA-228	1.19E+00	7.3E+01	1.0E-10	7.3E-09	RA-228	2.16E+00	3.1E+03	1.0E-10	3.1E-07	3.2E-07
SR-90	6.00E+01	3.7E+03	3.6E-11	1.3E-07	SR-90	3.00E+02	4.3E+05	3.6E-11	1.5E-05	1.6E-05
TC-99	5.74E+05	3.5E+07	1.3E-12	4.5E-05	TC-99	6.75E+05	9.6E+08	1.3E-12	1.3E-03	1.3E-03
TH-228	1.40E-02	8.5E-01	5.5E-11	4.7E-11	TH-228	1.19E-02	1.7E+01	5.5E-11	9.4E-10	9.8E-10
TH-230	4.50E-02	2.7E+00	1.3E-11	3.6E-11	TH-230	3.75E-02	5.4E+01	1.3E-11	7.0E-10	7.3E-10
TH-232	1.30E-02	7.9E-01	1.7E-10	1.3E-10	TH-232	1.08E-02	1.5E+01	1.7E-10	2.6E-09	2.8E-09
U-234	1.60E+00	9.8E+01	1.6E-11	1.6E-09	U-234	4.81E+00	6.9E+03	1.6E-11	1.1E-07	1.1E-07
U-235/236	1.64E-01	1.0E+01	1.6E-11	1.6E-10	U-235/236	4.93E-01	7.0E+02	1.6E-11	1.1E-08	1.1E-08
U-238	1.72E+00	1.0E+02	2.8E-11	2.9E-09	U-238	5.17E+00	7.4E+03	2.8E-11	2.1E-07	2.1E-07
			Total Pathway:	4.6E-05				Total Pathway:	1.3E-03	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	2.72E-03	4.3E-07	7.7E+00	3.3E-06	Aroclor-1254	8.59E-04	3.2E-06	7.7E+00	2.5E-05	2.8E-05
Aroclor-1260	1.18E-02	1.9E-06	7.7E+00	1.4E-05	Aroclor-1260	3.73E-03	1.4E-05	7.7E+00	1.1E-04	1.2E-04
Arsenic	3.64E-02	5.8E-06	1.8E+00	1.0E-05	Arsenic	1.09E-03	4.1E-06	1.8E+00	7.1E-06	1.7E-05
Benzo(a)anthracene	9.59E-02	1.5E-05	7.3E-01	1.1E-05	Benzo(a)anthracene	3.05E-02	1.1E-04	7.3E-01	8.3E-05	9.4E-05
Benzo(a)pyrene	3.17E-01	5.0E-05	7.3E+00	3.7E-04	Benzo(a)pyrene	1.01E-01	3.8E-04	7.3E+00	2.7E-03	3.1E-03
Benzo(b)fluoranthene	2.15E-01	3.4E-05	7.3E-01	2.5E-05	Benzo(b)fluoranthene	6.85E-02	2.6E-04	7.3E-01	1.9E-04	2.1E-04
Benzo(g,h,i)perylene	1.65E+00	2.6E-04			Benzo(g,h,i)perylene	5.25E-01	2.0E-03			
Benzo(k)fluoranthene	9.06E-01	1.4E-04	7.3E-02	1.1E-05	Benzo(k)fluoranthene	2.87E-01	1.1E-03	7.3E-02	7.8E-05	8.9E-05
Beryllium	9.43E-04	1.5E-07	4.3E+00	6.4E-07	Beryllium	8.48E-07	3.2E-09	4.3E+00	1.4E-08	6.6E-07
Lead	5.94E-03	9.4E-07			Lead	4.95E-03	1.8E-05			
Dibenzo(a,h)anthracene	2.35E-01	3.7E-05	7.3E+00	2.7E-04	Dibenzo(a,h)anthracene	7.45E-02	2.8E-04	7.3E+00	2.0E-03	2.3E-03
Dieldrin	3.99E-06	6.3E-10	1.6E+01	1.0E-08	Dieldrin	1.26E-06	4.7E-09	1.6E+01	7.5E-08	8.5E-08
Indeno(1,2,3-cd)pyrene	4.57E-01	7.3E-05	7.3E-01	5.3E-05	Indeno(1,2,3-cd)pyrene	1.45E-01	5.4E-04	7.3E-01	3.9E-04	4.5E-04
Phenanthrene	1.00E-02	1.6E-06			Phenanthrene	3.22E-03	1.2E-05			
TH-Total	1.20E-04	1.9E-08			TH-Total	9.96E-05	3.7E-07			
			Total Pathway:	7.7E-04				Total Pathway:	5.6E-03	
			Total Rad + Chem	8.1E-04				Total Rad + Chem	6.9E-03	*Total:* 7.8E-03

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TABLE B.3.2-22(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	4.5E+01	2.7E+03		
NP-237	6.5E-02	3.9E+00		
PU-238	3.0E-05	1.8E-03		
PU-239/240	2.0E-05	1.2E-03		
RA-226	9.6E+00	5.9E+02		
RA-228	1.2E+00	7.3E+01		
SR-90	6.0E+01	3.7E+03		
TC-99	5.7E+05	3.5E+07		
TH-228	1.4E-02	8.5E-01		
TH-230	4.5E-02	2.7E+00		
TH-232	1.3E-02	7.9E-01		
U-234	1.6E+00	9.8E+01		
U-235/236	1.6E-01	1.0E+01		
U-238	1.7E+00	1.0E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	1.57E+01	2.2E+04		
NP-237	5.89E-03	8.4E+00		
PU-238	6.07E-06	8.7E-03		
PU-239/240	3.97E-06	5.7E-03		
RA-226	1.73E+01	2.5E+04		
RA-228	2.16E+00	3.1E+03		
SR-90	3.00E+02	4.3E+05		
TC-99	6.75E+05	9.6E+08		
TH-228	1.19E-02	1.7E+01		
TH-230	3.75E-02	5.4E+01		
TH-232	1.08E-02	1.5E+01		
U-234	4.81E+00	6.9E+03		
U-235/236	4.93E-01	7.0E+02		
U-238	5.17E+00	7.4E+03		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	2.7E-03	5.0E-06		
Aroclor-1260	1.2E-02	2.2E-05		
Arsenic	3.6E-02	6.7E-05	3.0E-04	2.2E-01
Benzo(a)anthracene	9.6E-02	1.8E-04		
Benzo(a)pyrene	3.2E-01	5.9E-04		
Benzo(b)fluoranthene	2.2E-01	4.0E-04		
Benzo(g,h,i)perylene	1.7E+00	3.1E-03		
Benzo(k)fluoranthene	9.1E-01	1.7E-03		
Beryllium	9.4E-04	1.7E-06	5.0E-03	3.5E-04
Lead	5.9E-03	1.1E-05		
Dibenzo(a,h)anthracene	2.3E-01	4.4E-04		
Dieldrin	4.0E-06	7.4E-09	5.0E-05	1.5E-04
Indeno(1,2,3-cd)pyrene	4.6E-01	8.5E-04		
Phenanthrene	1.0E-02	1.9E-05		
TH-Total	1.2E-04	2.2E-07		

Total Pathway: 2.3E-01

Total Rad + Chem 2.3E-01

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254	8.6E-04	3.7E-05		
Aroclor-1260	3.7E-03	1.6E-04		
Arsenic	1.1E-03	4.7E-05	3.0E-04	1.6E-01
Benzo(a)anthracene	3.0E-02	1.3E-03		
Benzo(a)pyrene	1.0E-01	4.4E-03		
Benzo(b)fluoranthene	6.8E-02	3.0E-03		
Benzo(g,h,i)perylene	5.2E-01	2.3E-02		
Benzo(k)fluoranthene	2.9E-01	1.2E-02		
Beryllium	8.5E-07	3.7E-08	5.0E-03	7.4E-06
Lead	4.9E-03	2.2E-04		
Dibenzo(a,h)anthracene	7.5E-02	3.2E-03		
Dieldrin	1.3E-06	5.5E-08	5.0E-05	1.1E-03
Indeno(1,2,3-cd)pyrene	1.5E-01	6.3E-03		
Phenanthrene	3.2E-03	1.4E-04		
TH-Total	1.0E-04	4.3E-06		

Total Pathway: 1.6E-01

Total Rad + Chem 1.6E-01

Total	
	3.8E-01
	3.6E-04
	1.2E-03
Total:	3.8E-01

TABLE B.3.2-22(b)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			7.0E-07
NP-237	3.41E-04	2.1E-02	2.2E-10	4.6E-12	NP-237	3.19E-05	4.6E-02	2.2E-10	1.0E-11	1.5E-11	2.7E-09
PU-238			2.2E-10		PU-238			2.2E-10			2.3E-12
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.6E-12
RA-226			7.8E-10		RA-226			7.8E-10			2.0E-05
RA-228			1.0E-10		RA-228			1.0E-10			3.2E-07
SR-90	5.88E-03	3.6E-01	3.6E-11	1.3E-11	SR-90	2.99E-02	4.3E+01	3.6E-11	1.5E-09	1.5E-09	1.6E-05
TC-99	6.36E+00	3.9E+02	1.3E-12	5.0E-10	TC-99	7.66E+00	1.1E+04	1.3E-12	1.4E-08	1.5E-08	1.3E-03
TH-228			5.5E-11		TH-228			5.5E-11			9.8E-10
TH-230			1.3E-11		TH-230			1.3E-11			7.3E-10
TH-232			1.7E-10		TH-232			1.7E-10			2.8E-09
U-234	2.74E+01	1.7E+03	1.6E-11	2.7E-08	U-234	8.49E+01	1.2E+05	1.6E-11	1.9E-06	2.0E-06	2.1E-06
U-235/236	1.46E+00	8.9E+01	1.6E-11	1.4E-09	U-235/236	4.53E+00	6.5E+03	1.6E-11	1.0E-07	1.0E-07	1.2E-07
U-238	3.02E+01	1.8E+03	2.8E-11	5.1E-08	U-238	9.36E+01	1.3E+05	2.8E-11	3.7E-06	3.8E-06	4.0E-06
			Total Pathway:	8.0E-08				Total Pathway:	5.8E-06		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			2.8E-05
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			1.2E-04
Arsenic			1.8E+00		Arsenic			1.8E+00			1.7E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			9.4E-05
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			3.1E-03
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			2.1E-04
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02			
Beryllium			4.3E+00		Beryllium			4.3E+00			6.6E-07
Lead	1.32E-04	2.1E-08			Lead	1.13E-04	4.2E-07				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			2.3E-03
Dieldrin			1.6E+01		Dieldrin			1.6E+01			8.5E-08
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			4.5E-04
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.82E-05	6.1E-09			2-Methylnaphthalene	1.25E-05	4.6E-08				
Tributyl phosphate	3.53E-02	5.6E-06			Tributyl phosphate	4.56E-04	1.7E-06				
U-Total	3.38E-03	5.4E-07			U-Total	1.10E-03	4.1E-06				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	8.0E-08				Total Rad + Chem	5.8E-06	*Total:* 5.9E-06	7.7E-03

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TABLE B.3.2-22(b)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	3.4E-04	2.1E-02			NP-237	3.19E-05	4.6E-02				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	5.9E-03	3.6E-01			SR-90	2.99E-02	4.3E+01				
TC-99	6.4E+00	3.9E+02			TC-99	7.66E+00	1.1E+04				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	2.7E+01	1.7E+03			U-234	8.49E+01	1.2E+05				
U-235/236	1.5E+00	8.9E+01			U-235/236	4.53E+00	6.5E+03				
U-238	3.0E+01	1.8E+03			U-238	9.36E+01	1.3E+05				
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			3.8E-01
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			3.6E-04
Lead	1.3E-04	2.4E-07			Lead	1.1E-04	4.9E-06				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			1.2E-03
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.8E-05	7.1E-08			2-Methylnaphthalene	1.2E-05	5.4E-07				
Tributyl phosphate	3.5E-02	6.5E-05	5.0E-03	1.3E-02	Tributyl phosphate	4.6E-04	2.0E-05	5.0E-03	4.0E-03	1.7E-02	1.7E-02
U-Total	3.4E-03	6.3E-06	3.0E-03	2.1E-03	U-Total	1.1E-03	4.8E-05	3.0E-03	1.6E-02	1.8E-02	1.8E-02
			Total Pathway:	1.5E-02				Total Pathway:	2.0E-02		
			Total Rad + Chem	1.5E-02				Total Rad + Chem	2.0E-02	*Total:* 3.5E-02	4.2E-01

TABLE B.3.2-23
FUTURE, ON-PROPERTY FARMER (CT VALUES)
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.8E-04	1.5E+00	1.9E-11	2.9E-11
NP-237	7.6E-05	6.5E-01	2.9E-08	1.9E-08
PU-238	4.1E-05	3.5E-01	3.9E-08	1.4E-08
PU-239/240	2.7E-05	2.3E-01	3.8E-08	8.8E-09
RA-226	1.1E-02	9.4E+01	7.0E-09	6.6E-07
RA-228	1.4E-03	1.2E+01	6.9E-10	8.2E-09
SR-90	5.7E-04	4.9E+00	6.2E-11	3.0E-10
TC-99	5.1E-02	4.3E+02	8.3E-12	3.6E-09
TH-228	1.6E-03	1.3E+01	7.8E-08	1.0E-06
TH-230	4.9E-03	4.2E+01	2.9E-08	1.2E-06
TH-232	1.4E-03	1.2E+01	1.1E-07	1.3E-06
U-234	3.1E-03	2.6E+01	2.6E-08	6.9E-07
U-235/236	3.2E-04	2.7E+00	2.5E-08	6.8E-08
U-238	3.3E-03	2.8E+01	5.2E-08	1.5E-06
			Total Pathway:	6.6E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	4.99E-01	1.1E+02	2.8E-11	2.9E-09
NP-237	2.14E-01	4.5E+01	2.2E-10	9.9E-09
PU-238	1.16E-01	2.4E+01	2.2E-10	5.4E-09
PU-239/240	7.60E-02	1.6E+01	2.3E-10	3.7E-09
RA-226	3.08E+01	6.5E+03	7.8E-10	5.1E-06
RA-228	3.88E+00	8.2E+02	1.0E-10	8.2E-08
SR-90	1.60E+00	3.4E+02	3.6E-11	1.2E-08
TC-99	1.42E+02	3.0E+04	1.3E-12	3.9E-08
TH-228	4.41E+00	9.3E+02	5.5E-11	5.1E-08
TH-230	1.38E+01	2.9E+03	1.3E-11	3.8E-08
TH-232	3.99E+00	8.4E+02	1.7E-10	1.4E-07
U-234	8.66E+00	1.8E+03	1.6E-11	2.9E-08
U-235/236	8.87E-01	1.9E+02	1.6E-11	3.0E-09
U-238	9.31E+00	2.0E+03	2.8E-11	5.5E-08
			Total Pathway:	5.5E-06

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	3.18E-08	1.5E-10		
Aroclor-1260	1.86E-08	8.9E-11		
Arsenic	2.59E-06	1.2E-08	1.5E+01	1.9E-07
Benzo(a)anthracene	1.96E-06	9.4E-09	6.1E-01	5.7E-09
Benzo(a)pyrene	3.36E-06	1.6E-08	6.1E+00	9.8E-08
Benzo(b)fluoranthene	2.21E-06	1.1E-08	6.1E-01	6.5E-09
Benzo(g,h,i)perylene	2.21E-06	1.1E-08		
Benzo(k)fluoranthene	2.61E-06	1.2E-08	6.1E-02	7.6E-10
Beryllium	3.36E-07	1.6E-09	8.4E+00	1.4E-08
Lead	8.78E-06	4.2E-08		
Dibenzo(a,h)anthracene	6.78E-07	3.2E-09	6.1E+00	2.0E-08
Dieldrin	3.57E-09	1.7E-11	1.6E+01	2.7E-10
Indeno(1,2,3-cd)pyrene	2.14E-06	1.0E-08	6.1E-01	6.3E-09
Phenanthrene	8.21E-07	3.9E-09		
TH-Total	1.31E-05	6.3E-08		
			Total Pathway:	3.4E-07
			Total Rad + Chem	6.9E-06

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	8.90E-02	1.0E-08	7.7E+00	8.1E-08
Aroclor-1260	5.20E-02	6.1E-09	7.7E+00	4.7E-08
Arsenic	7.27E+00	8.6E-07	1.8E+00	1.5E-06
Benzo(a)anthracene	5.50E+00	6.5E-07	7.3E-01	4.7E-07
Benzo(a)pyrene	9.40E+00	1.1E-06	7.3E+00	8.1E-06
Benzo(b)fluoranthene	6.20E+00	7.3E-07	7.3E-01	5.3E-07
Benzo(g,h,i)perylene	6.20E+00	7.3E-07		
Benzo(k)fluoranthene	7.30E+00	8.6E-07	7.3E-02	6.3E-08
Beryllium	9.42E-01	1.1E-07	4.3E+00	4.8E-07
Lead	2.46E+01	2.9E-06		
Dibenzo(a,h)anthracene	1.90E+00	2.2E-07	7.3E+00	1.6E-06
Dieldrin	1.00E-02	1.2E-09	1.6E+01	1.9E-08
Indeno(1,2,3-cd)pyrene	6.00E+00	7.1E-07	7.3E-01	5.2E-07
Phenanthrene	2.30E+00	2.7E-07		
TH-Total	3.67E+01	4.3E-06		
			Total Pathway:	1.3E-05
			Total Rad + Chem	1.9E-05

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TABLE B.3.2-23
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil

Not applicable

Total Pathway:

External Radiation/Soil

Compound	Intake	SF(e)	Risk	Total
CS-137	1.7E+00	2.0E-06	3.5E-06	3.5E-06
NP-237	7.4E-01	4.3E-07	3.2E-07	3.5E-07
PU-238	4.0E-01	2.8E-11	1.1E-11	1.9E-08
PU-239/24	2.6E-01	2.7E-11	7.1E-12	1.3E-08
RA-226	1.1E+02	6.0E-06	6.4E-04	6.5E-04
RA-228	1.3E+01	2.9E-06	3.9E-05	3.9E-05
SR-90	5.6E+00			1.2E-08
TC-99	4.9E+02	6.0E-13	3.0E-10	4.3E-08
TH-228	1.5E+01	5.6E-06	8.6E-05	8.7E-05
TH-230	4.8E+01	5.4E-11	2.6E-09	1.3E-06
TH-232	1.4E+01	8.5E-06	1.2E-04	1.2E-04
U-234	3.0E+01	3.0E-11	9.0E-10	7.2E-07
U-235/236	3.1E+00	2.4E-07	7.4E-07	8.1E-07
U-238	3.2E+01	3.6E-08	1.2E-06	2.7E-06

Total Pathway: 8.9E-04

Chemical Risk

Dermal Contact/Soil

Compound	Intake	SF(derm)	Risk	Total
Aroclor-1254	6.3E-09	1.0E+01	6.5E-08	1.5E-07
Aroclor-1260	3.7E-09	1.0E+01	3.8E-08	8.5E-08
Arsenic	8.6E-09	1.8E+00	1.6E-08	1.7E-06
Benzo(a)anthracene			4.7E-07	9.5E-07
Benzo(a)pyrene			8.1E-06	1.6E-05
Benzo(b)fluoranthene			5.3E-07	1.1E-06
Benzo(g,h,i)perylene	2.2E-06			
Benzo(k)fluoranthene			6.3E-08	1.3E-07
Beryllium	1.1E-08		4.8E-07	9.7E-07
Lead	2.9E-07			
Dibenzo(a,h)anthracene			1.6E-06	3.3E-06
Dieldrin	7.1E-10	1.6E+01	1.1E-08	3.0E-08
Indeno(1,2,3-cd)pyrene			5.2E-07	1.0E-06
Phenanthrene	8.1E-07			
TH-Total	4.3E-07			

Total Pathway: 1.2E-05

External Radiation/Soil

Compound	Intake	SF(e)	Risk

Not applicable

Total Pathway:

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.2E-05 8.9E-04 *Total:* 9.3E-04

TABLE B.3.2-23
(continued)

Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.78E-04	1.5E+00		
NP-237	7.64E-05	6.5E-01		
PU-238	4.14E-05	3.5E-01		
PU-239/240	2.71E-05	2.3E-01		
RA-226	1.10E-02	9.4E+01		
RA-228	1.38E-03	1.2E+01		
SR-90	5.71E-04	4.9E+00		
TC-99	5.07E-02	4.3E+02		
TH-228	1.57E-03	1.3E+01		
TH-230	4.93E-03	4.2E+01		
TH-232	1.42E-03	1.2E+01		
U-234	3.09E-03	2.6E+01		
U-235/236	3.17E-04	2.7E+00		
U-238	3.32E-03	2.8E+01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	4.99E-01	1.1E+02		
NP-237	2.14E-01	4.5E+01		
PU-238	1.16E-01	2.4E+01		
PU-239/240	7.60E-02	1.6E+01		
RA-226	3.08E+01	6.5E+03		
RA-228	3.88E+00	8.2E+02		
SR-90	1.60E+00	3.4E+02		
TC-99	1.42E+02	3.0E+04		
TH-228	4.41E+00	9.3E+02		
TH-230	1.38E+01	2.9E+03		
TH-232	3.99E+00	8.4E+02		
U-234	8.66E+00	1.8E+03		
U-235/236	8.87E-01	1.9E+02		
U-238	9.31E+00	2.0E+03		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	3.18E-08	1.2E-09		
Aroclor-1260	1.86E-08	6.9E-10		
Arsenic	2.59E-06	9.6E-08		
Benzo(a)anthracene	1.96E-06	7.3E-08		
Benzo(a)pyrene	3.36E-06	1.3E-07		
Benzo(b)fluoranthene	2.21E-06	8.2E-08		
Benzo(g,h,i)perylene	2.21E-06	8.2E-08		
Benzo(k)fluoranthene	2.61E-06	9.7E-08		
Beryllium	3.36E-07	1.3E-08		
Lead	8.78E-06	3.3E-07		
Dibenzo(a,h)anthracene	6.78E-07	2.5E-08		
Dieldrin	3.57E-09	1.3E-10		
Indeno(1,2,3-cd)pyrene	2.14E-06	8.0E-08		
Phenanthrene	8.21E-07	3.1E-08		
TH-Total	1.31E-05	4.9E-07		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	8.90E-02	8.2E-08		
Aroclor-1260	5.20E-02	4.8E-08		
Arsenic	7.27E+00	6.7E-06	3.0E-04	2.2E-02
Benzo(a)anthracene	5.50E+00	5.0E-06		
Benzo(a)pyrene	9.40E+00	8.6E-06		
Benzo(b)fluoranthene	6.20E+00	5.7E-06		
Benzo(g,h,i)perylene	6.20E+00	5.7E-06		
Benzo(k)fluoranthene	7.30E+00	6.7E-06		
Beryllium	9.42E-01	8.6E-07	5.0E-03	1.7E-04
Lead	2.46E+01	2.3E-05		
Dibenzo(a,h)anthracene	1.90E+00	1.7E-06		
Dieldrin	1.00E-02	9.2E-09	5.0E-05	1.8E-04
Indeno(1,2,3-cd)pyrene	6.00E+00	5.5E-06		
Phenanthrene	2.30E+00	2.1E-06		
TH-Total	3.67E+01	3.4E-05		

Total Pathway: 2.3E-02

Total Rad + Chem

Total Rad + Chem 2.3E-02

000504

TABLE B.3.2-23
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	1.7E+00		
	NP-237	7.4E-01		
	PU-238	4.0E-01		
	PU-239/240	2.6E-01		
	RA-226	1.1E+02		
	RA-228	1.3E+01		
	SR-90	5.6E+00		
	TC-99	4.9E+02		
	TH-228	1.5E+01		
	TH-230	4.8E+01		
	TH-232	1.4E+01		
	U-234	3.0E+01		
	U-235/236	3.1E+00		
	U-238	3.2E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	4.9E-08							
Aroclor-1260	2.9E-08							
Arsenic	6.7E-08	2.9E-04	2.3E-04					2.2E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.7E-05							
Benzo(k)fluoranthene								
Beryllium	8.6E-08	5.0E-05	1.7E-03					1.9E-03
Lead	2.3E-06			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin	5.5E-09	5.0E-05	1.1E-04					2.9E-04
Indeno(1,2,3-cd)pyrene								
Phenanthrene	6.3E-06							
TH-Total	3.4E-06							
		Total Pathway:	2.1E-03			Total Pathway:		
		Total Rad + Chem	2.1E-03					*otal:* 2.5E-02

TABLE B.3.2-24
FUTURE, ON-PROPERTY FARMER (CT VALUES)
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.9E-02	5.6E+01	2.2E-10	1.2E-08
SR-90	2.7E-02	8.0E+01	3.6E-11	2.9E-09
TC-99	1.8E+00	5.4E+03	1.3E-12	7.0E-09
U-234	4.7E+02	1.4E+06	1.6E-11	2.2E-05
U-235/236	2.5E+01	7.4E+04	1.6E-11	1.2E-06
U-238	5.2E+02	1.5E+06	2.8E-11	4.3E-05

Total Pathway: 6.6E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene	7.2E-04	1.2E-06		
Lead	1.4E-03	2.4E-06		
Tributyl phosphate	1.4E-03	2.4E-06		
U-Total	1.8E+00	3.0E-03		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene	6.3E-06		
Lead	1.3E-05		
Tributyl phosphate	1.3E-05		
U-Total	1.6E-02		

Total Pathway:

Total Rad + Chem 6.6E-05

Total Rad + Chem

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TABLE B.3.2-24
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	1.2E-08
	2.9E-09
	7.0E-09
	2.2E-05
	1.2E-06
	4.3E-05

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene	4.1E-07		
Lead	2.3E-11		
Tributyl phosphate	1.8E-07		
U-Total	7.4E-06		

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 6.6E-05

TABLE B.3.2-24
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	1.9E-02	5.6E+01		
SR-90	2.7E-02	8.0E+01		
TC-99	1.8E+00	5.4E+03		
U-234	4.7E+02	1.4E+06		
U-235/236	2.5E+01	7.4E+04		
U-238	5.2E+02	1.5E+06		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene	7.2E-04	9.2E-06		
Lead	1.4E-03	1.8E-05		
Tributyl phosphate	1.4E-03	1.8E-05	5.0E-03	3.7E-03
U-Total	1.8E+00	2.4E-02	3.0E-03	7.9E+00

Total Pathway: 7.9E+00

Total Rad + Chem 7.9E+00

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene	4.9E-05		
Lead	9.8E-05		
Tributyl phosphate	9.8E-05		
U-Total	1.3E-01		

Total Pathway:

Total Rad + Chem

000598

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TABLE B.3.2-24
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				Total
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene	3.2E-06			
Lead	1.8E-10			
Tributyl phosphate	1.4E-06	4.5E-03	3.1E-04	4.0E-03
U-Total	5.7E-05	1.5E-04	3.8E-01	8.2E+00
Total Pathway:			3.8E-01	

Total Rad + Chem	3.8E-01	*Total:*	8.3E+00

TABLE B.3.2-25

FUTURE, ON-PROPERTY FARMER (CT VALUES)

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	6.41E-03	6.8E+02	2.8E-11	1.9E-08	CS-137	6.40E-03	3.8E+02	2.8E-11	1.1E-08	3.0E-08
NP-237	9.16E-04	9.7E+01	2.2E-10	2.1E-08	NP-237	9.17E-04	5.5E+01	2.2E-10	1.2E-08	3.3E-08
PU-238	2.23E-06	2.4E-01	2.2E-10	5.2E-11	PU-238	2.80E-06	1.7E-01	2.2E-10	3.7E-11	8.9E-11
PU-239/240	1.46E-06	1.5E-01	2.3E-10	3.6E-11	PU-239/240	1.83E-06	1.1E-01	2.3E-10	2.5E-11	6.1E-11
RA-226	1.98E-02	2.1E+03	7.8E-10	1.6E-06	RA-226	1.99E-02	1.2E+03	7.8E-10	9.3E-07	2.6E-06
RA-228	2.49E-03	2.6E+02	1.0E-10	2.6E-08	RA-228	2.49E-03	1.5E+02	1.0E-10	1.5E-08	4.1E-08
SR-90	1.71E-01	1.8E+04	3.6E-11	6.5E-07	SR-90	1.71E-01	1.0E+04	3.6E-11	3.7E-07	1.0E-06
TC-99	9.12E+01	9.6E+06	1.3E-12	1.3E-05	TC-99	9.12E+01	5.5E+06	1.3E-12	7.1E-06	2.0E-05
TH-228	1.60E-04	1.7E+01	5.5E-11	9.3E-10	TH-228	1.76E-04	1.1E+01	5.5E-11	5.8E-10	1.5E-09
TH-230	5.02E-04	5.3E+01	1.3E-11	6.9E-10	TH-230	5.71E-04	3.4E+01	1.3E-11	4.4E-10	1.1E-09
TH-232	1.45E-04	1.5E+01	1.7E-10	2.6E-09	TH-232	1.65E-04	9.9E+00	1.7E-10	1.7E-09	4.3E-09
U-234	1.48E-02	1.6E+03	1.6E-11	2.5E-08	U-234	1.49E-02	8.9E+02	1.6E-11	1.4E-08	3.9E-08
U-235/236	1.52E-03	1.6E+02	1.6E-11	2.6E-09	U-235/236	1.52E-03	9.1E+01	1.6E-11	1.5E-09	4.0E-09
U-238	1.59E-02	1.7E+03	2.8E-11	4.7E-08	U-238	1.60E-02	9.6E+02	2.8E-11	2.7E-08	7.4E-08
			Total Pathway:	1.5E-05				Total Pathway:	8.5E-06	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.83E-04	2.9E-08	7.7E+00	2.2E-07	Aroclor-1254	4.85E-04	1.6E-08	7.7E+00	1.2E-07	3.4E-07
Aroclor-1260	6.38E-05	3.8E-09	7.7E+00	2.9E-08	Aroclor-1260	6.42E-05	2.1E-09	7.7E+00	1.7E-08	4.6E-08
Arsenic	1.87E-02	1.1E-06	1.8E+00	1.9E-06	Arsenic	1.87E-02	6.3E-07	1.8E+00	1.1E-06	3.0E-06
Benzo(a)anthracene	4.88E-02	2.9E-06	7.3E-01	2.1E-06	Benzo(a)anthracene	4.85E-02	1.6E-06	7.3E-01	1.2E-06	3.3E-06
Benzo(a)pyrene	4.64E-02	2.7E-06	7.3E+00	2.0E-05	Benzo(a)pyrene	4.61E-02	1.5E-06	7.3E+00	1.1E-05	3.1E-05
Benzo(b)fluoranthene	2.98E-02	1.8E-06	7.3E-01	1.3E-06	Benzo(b)fluoranthene	2.96E-02	9.9E-07	7.3E-01	7.2E-07	2.0E-06
Benzo(g,h,i)perylene	6.80E-03	4.0E-07			Benzo(g,h,i)perylene	6.78E-03	2.3E-07			
Benzo(k)fluoranthene	1.35E-02	8.0E-07	7.3E-02	5.8E-08	Benzo(k)fluoranthene	1.35E-02	4.5E-07	7.3E-02	3.3E-08	9.1E-08
Beryllium	6.05E-04	3.6E-08	4.3E+00	1.5E-07	Beryllium	6.10E-04	2.0E-08	4.3E+00	8.8E-08	2.4E-07
Lead	6.41E-02	3.8E-06			Lead	6.42E-02	2.1E-06			
Dibenzo(a,h)anthracen	3.50E-03	2.1E-07	7.3E+00	1.5E-06	Dibenzo(a,h)anthracen	3.50E-03	1.2E-07	7.3E+00	8.5E-07	2.4E-06
Dieldrin	9.35E-03	5.5E-07	1.6E+01	8.9E-06	Dieldrin	9.35E-03	3.1E-07	1.6E+01	5.0E-06	1.4E-05
Indeno(1,2,3-cd)pyren	1.56E-02	9.3E-07	7.3E-01	6.8E-07	Indeno(1,2,3-cd)pyren	1.56E-02	5.2E-07	7.3E-01	3.8E-07	1.1E-06
Phenanthrene	8.70E-02	5.1E-06			Phenanthrene	8.48E-02	2.8E-06			
TH-Total	1.34E-03	7.9E-08			TH-Total	1.52E-03	5.1E-08			
			Total Pathway:	3.7E-05				Total Pathway:	2.1E-05	
			Total Rad + Chem	5.2E-05				Total Rad + Chem	2.9E-05	*Total:* 8.1E-05

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TABLE B.3.2-25

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	6.4E-03	6.8E+02			CS-137	6.40E-03	3.8E+02			
NP-237	9.2E-04	9.7E+01			NP-237	9.17E-04	5.5E+01			
PU-238	2.2E-06	2.4E-01			PU-238	2.80E-06	1.7E-01			
PU-239/240	1.5E-06	1.5E-01			PU-239/240	1.83E-06	1.1E-01			
RA-226	2.0E-02	2.1E+03			RA-226	1.99E-02	1.2E+03			
RA-228	2.5E-03	2.6E+02			RA-228	2.49E-03	1.5E+02			
SR-90	1.7E-01	1.8E+04			SR-90	1.71E-01	1.0E+04			
TC-99	9.1E+01	9.6E+06			TC-99	9.12E+01	5.5E+06			
TH-228	1.6E-04	1.7E+01			TH-228	1.76E-04	1.1E+01			
TH-230	5.0E-04	5.3E+01			TH-230	5.71E-04	3.4E+01			
TH-232	1.5E-04	1.5E+01			TH-232	1.65E-04	9.9E+00			
U-234	1.5E-02	1.6E+03			U-234	1.49E-02	8.9E+02			
U-235/236	1.5E-03	1.6E+02			U-235/236	1.52E-03	9.1E+01			
U-238	1.6E-02	1.7E+03			U-238	1.60E-02	9.6E+02			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.8E-04	2.2E-07			Aroclor-1254	4.85E-04	1.3E-07			
Aroclor-1260	6.4E-05	2.9E-08			Aroclor-1260	6.42E-05	1.7E-08			
Arsenic	1.9E-02	8.6E-06	3.0E-04	2.9E-02	Arsenic	1.87E-02	4.9E-06	3.0E-04	1.6E-02	4.5E-02
Benzo(a)anthracene	4.9E-02	2.2E-05			Benzo(a)anthracene	4.85E-02	1.3E-05			
Benzo(a)pyrene	4.6E-02	2.1E-05			Benzo(a)pyrene	4.61E-02	1.2E-05			
Benzo(b)fluoranthene	3.0E-02	1.4E-05			Benzo(b)fluoranthene	2.96E-02	7.7E-06			
Benzo(g,h,i)perylene	6.8E-03	3.1E-06			Benzo(g,h,i)perylene	6.78E-03	1.8E-06			
Benzo(k)fluoranthene	1.3E-02	6.2E-06			Benzo(k)fluoranthene	1.35E-02	3.5E-06			
Beryllium	6.0E-04	2.8E-07	5.0E-03	5.6E-05	Beryllium	6.10E-04	1.6E-07	5.0E-03	3.2E-05	8.7E-05
Lead	6.4E-02	2.9E-05			Lead	6.42E-02	1.7E-05			
Dibenzo(a,h)anthracen	3.5E-03	1.6E-06			Dibenzo(a,h)anthracen	3.50E-03	9.1E-07			
Dieldrin	9.4E-03	4.3E-06	5.0E-05	8.6E-02	Dieldrin	9.35E-03	2.4E-06	5.0E-05	4.9E-02	1.3E-01
Indeno(1,2,3-cd)pyren	1.6E-02	7.2E-06			Indeno(1,2,3-cd)pyren	1.56E-02	4.0E-06			
Phenanthrene	8.7E-02	4.0E-05			Phenanthrene	8.48E-02	2.2E-05			
TH-Total	1.3E-03	6.1E-07			TH-Total	1.52E-03	3.9E-07			
			Total Pathway:	1.1E-01				Total Pathway:	6.5E-02	
			Total Rad + Chem	1.1E-01				Total Rad + Chem	6.5E-02	*Total:* 1.8E-01

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TABLE B.3.2-25

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			3.0E-08
NP-237	9.41E-05	1.0E+01	2.2E-10	2.2E-09	NP-237	9.41E-05	5.6E+00	2.2E-10	1.2E-09	3.4E-09	3.7E-08
PU-238			2.2E-10		PU-238			2.2E-10			8.9E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			6.1E-11
RA-226			7.8E-10		RA-226			7.8E-10			2.6E-06
RA-228			1.0E-10		RA-228			1.0E-10			4.1E-08
SR-90	1.53E-04	1.6E+01	3.6E-11	5.8E-10	SR-90	1.53E-04	9.2E+00	3.6E-11	3.3E-10	9.1E-10	1.0E-06
TC-99	9.50E-03	1.0E+03	1.3E-12	1.3E-09	TC-99	9.50E-03	5.7E+02	1.3E-12	7.4E-10	2.0E-09	2.0E-05
TH-228			5.5E-11		TH-228			5.5E-11			1.5E-09
TH-230			1.3E-11		TH-230			1.3E-11			1.1E-09
TH-232			1.7E-10		TH-232			1.7E-10			4.3E-09
U-234	2.30E+00	2.4E+05	1.6E-11	3.9E-06	U-234	2.30E+00	1.4E+05	1.6E-11	2.2E-06	6.1E-06	6.1E-06
U-235/236	1.23E-01	1.3E+04	1.6E-11	2.1E-07	U-235/236	1.23E-01	7.3E+03	1.6E-11	1.2E-07	3.2E-07	3.3E-07
U-238	2.53E+00	2.7E+05	2.8E-11	7.5E-06	U-238	2.53E+00	1.5E+05	2.8E-11	4.2E-06	1.2E-05	1.2E-05
		Total Pathway:		1.2E-05			Total Pathway:		6.6E-06		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		3.4E-07
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00		4.6E-08
Arsenic			1.8E+00		Arsenic			1.8E+00		3.0E-06
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		3.3E-06
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		3.1E-05
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01		2.0E-06
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Benzo(k)fluoranthen			7.3E-02		Benzo(k)fluoranthene			7.3E-02		9.1E-08
Beryllium			4.3E+00		Beryllium			4.3E+00		2.4E-07
Lead	7.39E-03	4.4E-07			Lead	7.39E-03	2.5E-07			
Dibenzo(a,h)anthrac			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00		2.4E-06
Dieldrin			1.6E+01		Dieldrin			1.6E+01		1.4E-05
Indeno(1,2,3-cd)pyr			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01		1.1E-06
Phenanthrene					Phenanthrene					
TH-Total					TH-Total					
2-Methylnaphthalene	3.53E-03	2.1E-07			2-Methylnaphthalene	3.53E-03	1.2E-07			
Tributyl phosphate	7.43E-03	4.4E-07			Tributyl phosphate	7.43E-03	2.5E-07			
U-Total	9.00E+00	5.3E-04			U-Total	9.00E+00	3.0E-04			
		Total Pathway:					Total Pathway:			

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Total Rad + Chem 1.2E-05

Total Rad + Chem 6.6E-06 *Total:* 1.8E-05 9.9E-05

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TABLE B.3.2-25
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	9.4E-05				NP-237	9.41E-05					
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	1.5E-04				SR-90	1.53E-04					
TC-99	9.5E-03				TC-99	9.50E-03					
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	2.3E+00				U-234	2.30E+00					
U-235/236	1.2E-01				U-235/236	1.23E-01					
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			4.5E-02
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			8.7E-05
Lead	7.4E-03	3.4E-06			Lead	7.39E-03	1.9E-06				
Dibenzo(a,h)anthracen					Dibenzo(a,h)anthracen						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			1.3E-01
Indeno(1,2,3-cd)pyren					Indeno(1,2,3-cd)pyren						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.5E-03	1.6E-06			2-Methylnaphthalene	3.53E-03	9.2E-07				
Tributyl phosphate	7.4E-03	3.4E-06	5.0E-03	6.8E-04	Tributyl phosphate	7.43E-03	1.9E-06	5.0E-03	3.9E-04	1.1E-03	1.4E-01
U-Total	9.0E+00	4.1E-03	3.0E-03	1.4E+00	U-Total	9.00E+00	2.3E-03	3.0E-03	7.8E-01	2.2E+00	2.2E+00
			Total Pathway:	1.4E+00				Total Pathway:	7.8E-01		

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Total Rad + Chem 1.4E+00

Total Rad + Chem 7.8E-01 | *Total:* 2.2E+00 | 2.5E+00

TABLE B.3.2-26
FUTURE ON-PROPERTY FARMER (CT VALUES)
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	4.48E+01	4.7E+03	2.8E-11	1.3E-07	CS-137	1.57E+01	5.2E+03	2.8E-11	1.5E-07	2.8E-07
NP-237	6.47E-02	6.8E+00	2.2E-10	1.5E-09	NP-237	5.89E-03	2.0E+00	2.2E-10	4.3E-10	1.9E-09
PU-238	3.03E-05	3.2E-03	2.2E-10	7.0E-13	PU-238	6.07E-06	2.0E-03	2.2E-10	4.4E-13	1.1E-12
PU-239/240	1.99E-05	2.1E-03	2.3E-10	4.8E-13	PU-239	3.97E-06	1.3E-03	2.3E-10	3.0E-13	7.8E-13
RA-226	9.63E+00	1.0E+03	7.8E-10	7.9E-07	RA-226	1.73E+01	5.7E+03	7.8E-10	4.5E-06	5.3E-06
RA-228	1.19E+00	1.3E+02	1.0E-10	1.3E-08	RA-228	2.16E+00	7.2E+02	1.0E-10	7.2E-08	8.4E-08
SR-90	6.00E+01	6.3E+03	3.6E-11	2.3E-07	SR-90	3.00E+02	1.0E+05	3.6E-11	3.6E-06	3.8E-06
TC-99	5.74E+05	6.0E+07	1.3E-12	7.9E-05	TC-99	6.75E+05	2.2E+08	1.3E-12	2.9E-04	3.7E-04
TH-228	1.40E-02	1.5E+00	5.5E-11	8.1E-11	TH-228	1.19E-02	3.9E+00	5.5E-11	2.2E-10	3.0E-10
TH-230	4.50E-02	4.7E+00	1.3E-11	6.2E-11	TH-230	3.75E-02	1.2E+01	1.3E-11	1.6E-10	2.2E-10
TH-232	1.30E-02	1.4E+00	1.7E-10	2.3E-10	TH-232	1.08E-02	3.6E+00	1.7E-10	6.1E-10	8.4E-10
U-234	1.60E+00	1.7E+02	1.6E-11	2.7E-09	U-234	4.81E+00	1.6E+03	1.6E-11	2.6E-08	2.8E-08
U-235/236	1.64E-01	1.7E+01	1.6E-11	2.8E-10	U-235	4.93E-01	1.6E+02	1.6E-11	2.6E-09	2.9E-09
U-238	1.72E+00	1.8E+02	2.8E-11	5.1E-09	U-238	5.17E+00	1.7E+03	2.8E-11	4.8E-08	5.3E-08
			Total Pathway:	8.0E-05				Total Pathway:	3.0E-04	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	2.72E-03	1.6E-07	7.7E+00	1.2E-06	Aroclor-1254	8.59E-04	1.6E-07	7.7E+00	1.2E-06	2.5E-06
Aroclor-1260	1.18E-02	6.9E-07	7.7E+00	5.3E-06	Aroclor-1260	3.73E-03	6.9E-07	7.7E+00	5.3E-06	1.1E-05
Arsenic	3.64E-02	2.1E-06	1.8E+00	3.7E-06	Arsenic	1.09E-03	2.0E-07	1.8E+00	3.5E-07	4.1E-06
Benzo(a)anthracene	9.59E-02	5.6E-06	7.3E-01	4.1E-06	Benzo(a)anthracene	3.05E-02	5.6E-06	7.3E-01	4.1E-06	8.2E-06
Benzo(a)pyrene	3.17E-01	1.9E-05	7.3E+00	1.4E-04	Benzo(a)pyrene	1.01E-01	1.9E-05	7.3E+00	1.4E-04	2.7E-04
Benzo(b)fluoranthene	2.15E-01	1.3E-05	7.3E-01	9.3E-06	Benzo(b)fluoranthene	6.85E-02	1.3E-05	7.3E-01	9.3E-06	1.9E-05
Benzo(g,h,i)perylene	1.65E+00	9.7E-05			Benzo(g,h,i)perylene	5.25E-01	9.7E-05			
Benzo(k)fluoranthene	9.06E-01	5.3E-05	7.3E-02	3.9E-06	Benzo(k)fluoranthene	2.87E-01	5.3E-05	7.3E-02	3.9E-06	7.8E-06
Beryllium	9.43E-04	5.6E-08	4.3E+00	2.4E-07	Beryllium	8.48E-07	1.6E-10	4.3E+00	6.8E-10	2.4E-07
Lead	5.94E-03	3.5E-07			Lead	4.95E-03	9.2E-07			
Dibenzo(a,h)anthracene	2.35E-01	1.4E-05	7.3E+00	1.0E-04	Dibenzo(a,h)anthracene	7.45E-02	1.4E-05	7.3E+00	1.0E-04	2.0E-04
Dieldrin	3.99E-06	2.3E-10	1.6E+01	3.8E-09	Dieldrin	1.26E-06	2.3E-10	1.6E+01	3.7E-09	7.5E-09
Indeno(1,2,3-cd)pyrene	4.57E-01	2.7E-05	7.3E-01	2.0E-05	Indeno(1,2,3-cd)pyrene	1.45E-01	2.7E-05	7.3E-01	2.0E-05	3.9E-05
Phenanthrene	1.00E-02	5.9E-07			Phenanthrene	3.22E-03	6.0E-07			
TH-Total	1.20E-04	7.0E-09			TH-Total	9.96E-05	1.8E-08			
			Total Pathway:	2.8E-04				Total Pathway:	2.8E-04	
			Total Rad + Chem	3.6E-04				Total Rad + Chem	5.8E-04	*Total:* 9.4E-04

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TABLE B.3.2-26
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	4.5E+01	4.7E+03			CS-137	1.57E+01	5.2E+03			
NP-237	6.5E-02	6.8E+00			NP-237	5.89E-03	2.0E+00			
PU-238	3.0E-05	3.2E-03			PU-238	6.07E-06	2.0E-03			
PU-239/240	2.0E-05	2.1E-03			PU-239/240	3.97E-06	1.3E-03			
RA-226	9.6E+00	1.0E+03			RA-226	1.73E+01	5.7E+03			
RA-228	1.2E+00	1.3E+02			RA-228	2.16E+00	7.2E+02			
SR-90	6.0E+01	6.3E+03			SR-90	3.00E+02	1.0E+05			
TC-99	5.7E+05	6.0E+07			TC-99	6.75E+05	2.2E+08			
TH-228	1.4E-02	1.5E+00			TH-228	1.19E-02	3.9E+00			
TH-230	4.5E-02	4.7E+00			TH-230	3.75E-02	1.2E+01			
TH-232	1.3E-02	1.4E+00			TH-232	1.08E-02	3.6E+00			
U-234	1.6E+00	1.7E+02			U-234	4.81E+00	1.6E+03			
U-235/236	1.6E-01	1.7E+01			U-235/236	4.93E-01	1.6E+02			
U-238	1.7E+00	1.8E+02			U-238	5.17E+00	1.7E+03			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	2.7E-03	1.2E-06			Aroclor-1254	8.6E-04	1.2E-06			
Aroclor-1260	1.2E-02	5.4E-06			Aroclor-1260	3.7E-03	5.4E-06			
Arsenic	3.6E-02	1.7E-05	3.0E-04	5.5E-02	Arsenic	1.1E-03	1.6E-06	3.0E-04	5.2E-03	6.1E-02
Benzo(a)anthracene	9.6E-02	4.4E-05			Benzo(a)anthracene	3.0E-02	4.4E-05			
Benzo(a)pyrene	3.2E-01	1.5E-04			Benzo(a)pyrene	1.0E-01	1.5E-04			
Benzo(b)fluoranthene	2.2E-01	9.9E-05			Benzo(b)fluoranthene	6.8E-02	9.9E-05			
Benzo(g,h,i)perylene	1.7E+00	7.6E-04			Benzo(g,h,i)perylene	5.2E-01	7.6E-04			
Benzo(k)fluoranthene	9.1E-01	4.1E-04			Benzo(k)fluoranthene	2.9E-01	4.1E-04			
Beryllium	9.4E-04	4.3E-07	5.0E-03	8.6E-05	Beryllium	8.5E-07	1.2E-09	5.0E-03	2.4E-07	8.7E-05
Lead	5.9E-03	2.7E-06			Lead	4.9E-03	7.1E-06			
Dibenzo(a,h)anthracene	2.3E-01	1.1E-04			Dibenzo(a,h)anthracene	7.5E-02	1.1E-04			
Dieldrin	4.0E-06	1.8E-09	5.0E-05	3.7E-05	Dieldrin	1.3E-06	1.8E-09	5.0E-05	3.6E-05	7.3E-05
Indeno(1,2,3-cd)pyrene	4.6E-01	2.1E-04			Indeno(1,2,3-cd)pyrene	1.5E-01	2.1E-04			
Phenanthrene	1.0E-02	4.6E-06			Phenanthrene	3.2E-03	4.6E-06			
TH-Total	1.2E-04	5.5E-08			TH-Total	1.0E-04	1.4E-07			
		Total Pathway:		5.6E-02			Total Pathway:		5.3E-03	
		Total Rad + Chem		5.6E-02			Total Rad + Chem		5.3E-03	*Total:* 6.1E-02

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TABLE B.3.2-26
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			2.8E-07
NP-237	3.41E-04	3.6E-02	2.2E-10	7.9E-12	NP-237	3.19E-05	1.1E-02	2.2E-10	2.3E-12	1.0E-11	1.9E-09
PU-238			2.2E-10		PU-238			2.2E-10			1.1E-12
PU-239/240			2.3E-10		PU-239/240			2.3E-10			7.8E-13
RA-226			7.8E-10		RA-226			7.8E-10			5.3E-06
RA-228			1.0E-10		RA-228			1.0E-10			8.4E-08
SR-90	5.88E-03	6.2E-01	3.6E-11	2.2E-11	SR-90	2.99E-02	9.9E+00	3.6E-11	3.6E-10	3.8E-10	3.8E-06
TC-99	6.36E+00	6.7E+02	1.3E-12	8.7E-10	TC-99	7.66E+00	2.5E+03	1.3E-12	3.3E-09	4.2E-09	3.7E-04
TH-228			5.5E-11		TH-228			5.5E-11			3.0E-10
TH-230			1.3E-11		TH-230			1.3E-11			2.2E-10
TH-232			1.7E-10		TH-232			1.7E-10			8.4E-10
U-234	2.74E+01	2.9E+03	1.6E-11	4.6E-08	U-234	8.49E+01	2.8E+04	1.6E-11	4.5E-07	5.0E-07	5.2E-07
U-235/236	1.46E+00	1.5E+02	1.6E-11	2.5E-09	U-235/236	4.53E+00	1.5E+03	1.6E-11	2.4E-08	2.6E-08	2.9E-08
U-238	3.02E+01	3.2E+03	2.8E-11	8.9E-08	U-238	9.36E+01	3.1E+04	2.8E-11	8.7E-07	9.6E-07	1.0E-06
			Total Pathway:	1.4E-07				Total Pathway:	1.3E-06		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			2.5E-06
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			1.1E-05
Arsenic			1.8E+00		Arsenic			1.8E+00			4.1E-06
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			8.2E-06
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			2.7E-04
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			1.9E-05
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02			
Beryllium			4.3E+00		Beryllium			4.3E+00			2.4E-07
Lead	1.32E-04	7.8E-09			Lead	1.13E-04	2.1E-08				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			2.0E-04
Dieldrin			1.6E+01		Dieldrin			1.6E+01			7.5E-09
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			3.9E-05
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.82E-05	2.2E-09			2-Methylnaphthalene	1.25E-05	2.3E-09				
Tributyl phosphate	3.53E-02	2.1E-06			Tributyl phosphate	4.56E-04	8.5E-08				
U-Total	3.38E-03	2.0E-07			U-Total	1.10E-03	2.0E-07				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	1.4E-07				Total Rad + Chem	1.3E-06	*Total:* 1.5E-06	9.4E-04

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TABLE B.3.2-26
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	3.4E-04	3.6E-02			NP-237	3.19E-05	1.1E-02				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	5.9E-03	6.2E-01			SR-90	2.99E-02	9.9E+00				
TC-99	6.4E+00	6.7E+02			TC-99	7.66E+00	2.5E+03				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	2.7E+01	2.9E+03			U-234	8.49E+01	2.8E+04				
U-235/236	1.5E+00	1.5E+02			U-235/236	4.53E+00	1.5E+03				
U-238	3.0E+01	3.2E+03			U-238	9.36E+01	3.1E+04				
			Total Pathway:								

Chemical Hazard

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			6.1E-02
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			8.7E-05
Lead	1.3E-04	6.0E-08			Lead	1.1E-04	1.6E-07				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			7.3E-05
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene	3.8E-05	1.7E-08			2-Methylnaphthalene	1.2E-05	1.8E-08				
Tributyl phosphate	3.5E-02	1.6E-05	5.0E-03	3.2E-03	Tributyl phosphate	4.6E-04	6.6E-07	5.0E-03	1.3E-04	3.4E-03	3.4E-03
U-Total	3.4E-03	1.5E-06	3.0E-03	5.2E-04	U-Total	1.1E-03	1.6E-06	3.0E-03	5.3E-04	1.0E-03	1.0E-03
			Total Pathway:	3.7E-03				Total Pathway:	6.6E-04		
			Total Rad + Chem	3.7E-03				Total Rad + Chem	6.6E-04	*Total:* 4.4E-03	6.5E-02

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TABLE B.3.2-27
FUTURE, ON-SUBUNIT HOMEBUILDER
SOUTH FIELD: SUBSURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.78E-04	6.23E-01	1.9E-11	1.2E-11
NP-237	7.64E-05	2.67E-01	2.9E-08	7.8E-09
PB-210			4.0E-09	
PU-238	4.14E-05	1.45E-01	3.9E-08	5.7E-09
PU-239/240	2.71E-05	9.49E-02	3.8E-08	3.6E-09
RA-224			1.2E-09	
RA-226	1.10E-02	3.85E+01	7.0E-09	2.7E-07
RA-228	1.38E-03	4.83E+00	6.9E-10	3.3E-09
RU-106			4.4E-10	
TH-228	1.57E-03	5.50E+00	7.8E-08	4.3E-07
TH-230	4.93E-03	1.73E+01	2.9E-08	5.0E-07
TH-232	1.42E-03	4.97E+00	1.1E-07	5.5E-07
U-234	3.09E-03	1.08E+01	2.6E-08	2.8E-07
U-235/236	3.17E-04	1.11E+00	2.5E-08	2.8E-08
U-238	3.32E-03	1.16E+01	5.2E-08	6.0E-07
			Total Pathway:	2.7E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	2.37E-01	2.0E+01	2.8E-11	5.6E-10
NP-237	3.00E-01	2.5E+01	2.2E-10	5.5E-09
PB-210	6.01E+00	5.1E+02	6.6E-10	3.3E-07
PU-238	4.00E-02	3.4E+00	2.2E-10	7.4E-10
PU-239/240	2.10E-02	1.8E+00	2.3E-10	4.1E-10
RA-224	3.13E+00	2.6E+02	3.8E-11	1.0E-08
RA-226	2.92E+00	2.5E+02	7.8E-10	1.9E-07
RA-228	1.66E+00	1.4E+02	1.0E-10	1.4E-08
RU-106	1.30E+00	1.1E+02	9.5E-12	1.0E-09
TH-228	1.70E+00	1.4E+02	5.5E-11	7.9E-09
TH-230	4.26E+00	3.6E+02	1.3E-11	4.7E-09
TH-232	1.53E+00	1.3E+02	1.7E-10	2.2E-08
U-234	3.02E+01	2.5E+03	1.6E-11	4.1E-08
U-235/236	5.76E+00	4.8E+02	1.6E-11	7.7E-09
U-238	3.23E+01	2.7E+03	2.8E-11	7.6E-08
			Total Pathway:	7.2E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	3.18E-08	6.22E-11		
Aroclor-1260	1.86E-08	3.64E-11		
Arsenic	2.59E-06	5.07E-09	1.50E+01	7.6E-08
Benzo(a)anthracene	1.96E-06	3.84E-09	6.10E-01	2.3E-09
Benzo(a)pyrene	3.36E-06	6.58E-09	6.10E+00	4.0E-08
Benzo(b)fluoranthene	2.21E-06	4.32E-09	6.10E-01	2.6E-09
Benzo(g,h,i)perylene	2.21E-06	4.32E-09		
Beryllium	3.36E-07	6.58E-10	8.40E+00	5.5E-09
Lead	8.78E-06	1.72E-08		
Dieldrin	3.57E-09	6.99E-12	1.60E+01	1.1E-10
Phenanthrene	8.21E-07	1.61E-09		
Tributyl Phosphate				
Octachlorodibenzo-p-dioxin			1.50E+02	
Tetrachlorodibenzofuran			1.50E+04	
TH-Total	1.31E-05	2.56E-08		
U-Total				
			Total Pathway:	1.3E-07
			Total Rad + Chem	2.8E-06

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	4.30E-01	2.0E-08	7.7E+00	1.6E-07
Aroclor-1260	8.90E-02	4.2E-09	7.7E+00	3.2E-08
Arsenic	1.21E+01	5.7E-07	1.8E+00	9.9E-07
Benzo(a)anthracene	1.30E-01	6.1E-09	7.3E-01	4.5E-09
Benzo(a)pyrene	1.10E-01	5.2E-09	7	3.8E-08
Benzo(b)fluoranthene	1.40E-01	6.6E-09	7.3E-01	4.8E-09
Benzo(g,h,i)perylene	5.90E-02	2.8E-09		
Beryllium	1.44E+00	6.8E-08	4.3E+00	2.9E-07
Lead	2.81E+01	1.3E-06		
Dieldrin	1.60E-02	7.5E-10	1.6E+01	1.2E-08
Phenanthrene	2.10E-01	9.9E-09		
Tributyl Phosphate	2.00E-01	9.4E-09		
Octachlorodibenzo-p-dioxin	3.60E-03	1.7E-10	1.5E+02	2.5E-08
Tetrachlorodibenzofuran	1.80E-05	8.5E-13	1.5E+04	1.3E-08
TH-Total	1.37E+01	6.4E-07		
U-Total	1.04E+02	4.9E-06		
			Total Pathway:	1.6E-06
			Total Rad + Chem	2.3E-06

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TABLE B.3.2-27 (continued)
FUTURE, ON-SUBUNIT HOMEBUILDER
SOUTH FIELD: SUBSURFACE SOIL
Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil				
Not applicable				
Total Pathway:				

External Radiation/Soil				
Compound	Intake	SF(e)	Risk	
CS-137	2.8E-02	2.0E-06	5.7E-08	5.7E-08
NP-237	3.6E-02	4.3E-07	1.5E-08	2.9E-08
PB-210	7.2E-01	1.6E-10	1.2E-10	3.3E-07
PU-238	4.8E-03	2.8E-11	1.3E-13	6.4E-09
PU-239/240	2.5E-03	2.7E-11	6.8E-14	4.0E-09
RA-224	3.8E-01	2.3E-08	8.6E-09	1.9E-08
RA-226	3.5E-01	6.0E-06	2.1E-06	2.6E-06
RA-228	2.0E-01	2.9E-06	5.8E-07	5.9E-07
RU-106	1.6E-01			1.0E-09
TH-228	2.0E-01	5.6E-06	1.1E-06	1.6E-06
TH-230	5.1E-01	5.4E-11	2.8E-11	5.1E-07
TH-232	1.8E-01	8.5E-06	1.6E-06	2.1E-06
U-234	3.6E+00	3.0E-11	1.1E-10	3.2E-07
U-235/236	6.9E-01	2.4E-07	1.7E-07	2.0E-07
U-238	3.9E+00	3.6E-08	1.4E-07	8.2E-07
Total Pathway:				5.8E-06

Chemical Risk

Dermal Contact/Soil				
Compound	Intake	SF(derm)	Risk	
Aroclor-1254	1.5E-08	1.0E+01	1.5E-07	3.0E-07
Aroclor-1260	3.0E-09	1.0E+01	3.1E-08	6.3E-08
Arsenic	6.8E-09	1.8E+00	1.2E-08	1.1E-06
Benzo(a)anthracene			4.5E-09	1.1E-08
Benzo(a)pyrene			3.8E-08	1.2E-07
Benzo(b)fluoranthene			4.8E-09	1.2E-08
Benzo(g,h,i)perylene				
Beryllium			2.9E-07	5.9E-07
Lead	1.6E-07			
Dieldrin	5.4E-10			1.2E-08
Phenanthrene	3.5E-08			
Tributyl Phosphate	3.4E-08			
Octachlorodibenzo-p-dioxin	6.1E-11	3.0E+02	1.8E-08	4.4E-08
Tetrachlorodibenzofuran	3.0E-13	3.0E+04	9.1E-09	2.2E-08
TH-Total	7.7E-08			
U-Total	5.9E-07			
Total Pathway:			5.6E-07	

External Radiation/Soil				
Compound	Intake	SF(o)	Risk	
Not applicable				
Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 5.6E-07 5.8E-06 *Total:* 1.1E-05

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TABLE B.3.2-27 (continued)
FUTURE, ON-SUBUNIT HOMEBUILDER
SOUTH FIELD: SUBSURFACE SOIL
Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137				
NP-237				
PB-210				
PU-238				
PU-239/240				
RA-224				
RA-226				
RA-228				
RU-106				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
Total Pathway:				

Ingestion/Soil				
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	0.24	2.0E+01		
NP-237	0.30	2.5E+01		
PB-210	6.01	5.1E+02		
PU-238	0.04	3.4E+00		
PU-239/240	0.02	1.8E+00		
RA-224	3.13	2.6E+02		
RA-226	2.92	2.5E+02		
RA-228	1.66	1.4E+02		
RU-106	1.30	1.1E+02		
TH-228	1.70	1.4E+02		
TH-230	4.26	3.6E+02		
TH-232	1.53	1.3E+02		
U-234	30.19	2.5E+03		
U-235/236	5.76	4.8E+02		
U-238	32.30	2.7E+03		
Total Pathway:				

Chemical Hazard

Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium				
Lead				
Dieldrin				
Phenanthrene				
Tributyl Phosphate				
Octachlorodibenzo-p-dioxin				
Tetrachlorodibenzofuran				
TH-Total				
U-Total				
Total Pathway:				

Ingestion/Soil				
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	0.4	1.4E-06		
Aroclor-1260	0.1	2.9E-07		
Arsenic	12.1	4.0E-05	3.0E-04	1.3E-01
Benzo(a)anthracene	0.1	4.3E-07		
Benzo(a)pyrene	0.11	3.6E-07		
Benzo(b)fluoranthene	0.14	4.6E-07		
Benzo(g,h,i)perylene	0.059	1.9E-07		
Beryllium	1.438	4.7E-06	5.0E-03	9.5E-04
Lead	28.080	9.2E-05		
Dieldrin	0.016	5.3E-08	5.0E-05	1.1E-03
Phenanthrene	0.210	6.9E-07		
Tributyl Phosphate	0.200	6.6E-07	5.0E-03	1.3E-04
Octachlorodibenzo-p-dioxin	0.004	1.2E-08		
Tetrachlorodibenzofuran	1.8E-05	5.9E-11		
TH-Total	13.650	4.5E-05		
U-Total	104.400	3.4E-04	3.0E-03	1.1E-01
Total Pathway:				2.5E-01

Total Rad + Chem

Total Rad + Chem 2.5E-01

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TABLE B.3.2-27 (continued)
FUTURE, ON-SUBUNIT HOMEBUILDER
SOUTH FIELD: SUBSURFACE SOIL
Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	2.8E-02		
	NP-237	3.6E-02		
	PB-210	7.2E-01		
	PU-238	4.8E-03		
	PU-239/240	2.5E-03		
	RA-224	3.8E-01		
	RA-226	3.5E-01		
	RA-228	2.0E-01		
	RU-106	1.6E-01		
	TH-228	2.0E-01		
	TH-230	5.1E-01		
	TH-232	1.8E-01		
	U-234	3.6E+00		
	U-235/236	6.9E-01		
	U-238	3.9E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	1.0E-06							
Aroclor-1260	2.1E-07							
Arsenic	4.7E-07	2.9E-04	1.7E-03	Not applicable				1.3E-01
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	7.0E-07							
Beryllium	5.7E-07	5.0E-05	1.1E-02					1.2E-02
Lead	1.1E-05							
Dieldrin	3.8E-08	5.0E-05	7.6E-04					1.8E-03
Phenanthrene	2.5E-06							
Tributyl Phosphate	2.4E-06	4.5E-03	5.3E-04					6.6E-04
Octachlorodibenzo-p-dioxin	4.3E-09							
Tetrachlorodibenzofuran	2.1E-11							
TH-Total	5.4E-06							
U-Total	4.1E-05	1.5E-04	2.7E-01					3.9E-01
	Total Pathway:		2.9E-01		Total Pathway:			

Total Rad + Chem 2.9E-01

Total: 5.4E-01

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TABLE B.3.2-28(a)
CURRENT/FUTURE, GREAT MIAMI RIVER RECREATIONAL USER, ADULT
SOUTH FIELD: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Radiation Risk

Ingestion of Surface Water

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.4E-05	6.6E-04	2.2E-10	1.4E-13
PU-238	6.6E-07	1.8E-05	2.2E-10	4.0E-15
RA-226	1.7E-04	4.5E-03	7.8E-10	3.5E-12
RA-228	2.1E-05	5.7E-04	1.0E-10	5.7E-14
SR-90	3.5E-03	9.7E-02	3.6E-11	3.5E-12
TC-99	5.1E-01	1.4E+01	1.3E-12	1.8E-11
U-234	4.2E-03	1.1E-01	1.6E-11	1.8E-12
U-235/236	3.7E-04	1.0E-02	1.6E-11	1.6E-13
U-238	4.5E-03	1.2E-01	2.8E-11	3.5E-12
			Total Pathway:	3.1E-11

Dermal Contact/Surface Water

Not Applicable

Total Pathway:

Ingestion of Fish

Compound	Conc'n (pCi/L)	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
NP-237	2.4E-05	2.41E-04	4.8E+01	2.2E-10	1.0E-08
PU-238	6.6E-07	1.66E-05	3.3E+00	2.2E-10	7.2E-10
RA-226	1.7E-04	8.30E-03	1.6E+03	7.8E-10	1.3E-06
RA-228	2.1E-05	1.05E-03	2.1E+02	1.0E-10	2.1E-08
SR-90	3.5E-03	1.06E-01	2.1E+04	3.6E-11	7.6E-07
TC-99	5.1E-01	7.59E+00	1.5E+06	1.3E-12	2.0E-06
U-234	4.2E-03	8.34E-03	1.6E+03	1.6E-11	2.6E-08
U-235/236	3.7E-04	7.30E-04	1.4E+02	1.6E-11	2.3E-09
U-238	4.5E-03	9.03E-03	1.8E+03	2.8E-11	5.0E-08
				Total Pathway:	4.1E-06

Total

1.0E-08
7.2E-10
1.3E-06
2.1E-08
7.6E-07
2.0E-06
2.6E-08
2.3E-09
5.0E-08

Chemical Risk

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	2.1E-08	3.2E-13	1.8E+00	5.6E-13
Beryllium	2.2E-09	3.3E-14	4.3E+00	1.4E-13
Lead	3.7E-07	5.6E-12		
Nickel	2.4E-08	3.7E-13		
Benzo(a)anthracene	4.3E-09	6.6E-14	7.3E-01	4.8E-14
Benzo(a)pyrene	3.1E-09	4.7E-14	7.3E+00	3.4E-13
Benzo(b)fluoranthen	5.2E-10	8.0E-15	7.3E-01	5.8E-15
Benzo(g,h,i)perylene	1.5E-08	2.3E-13		
bis(2-Ethylhexyl)phthala	3.5E-08	5.3E-13	1.4E-02	7.4E-15
Dibenzo(a,h)anthracene	6.4E-10	9.8E-15	7.3E+00	7.1E-14
Dieldrin	9.5E-10	1.5E-14	1.6E+01	2.3E-13
U-TOTAL	1.4E-05	2.1E-10		
Phenanthrene	4.6E-06	7.0E-11		
			Total Pathway	1.4E-12

Dermal Contact/Surface Water

Compound	Intake	SF(derm)	Risk
Arsenic	1.5E-13	1.8E+00	2.7E-13
Beryllium			1.4E-13
Lead	1.0E-14		
Nickel	1.7E-13		
Benzo(a)anthracene			4.8E-14
Benzo(a)pyrene			3.4E-13
Benzo(b)fluoranthene			5.8E-15
Benzo(g,h,i)perylene			
bis(2-Ethylhexyl)phthala	1.5E-12	1.4E-02	7.4E-15
Dibenzo(a,h)anthracene			7.1E-14
Dieldrin	1.1E-13	1.6E+01	1.7E-12
U-TOTAL	9.8E-11		
Phenanthrene	7.4E-09		
		Total Pathway	2.6E-12

Ingestion of Fish

Compound	Conc'n (mg/L)	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
Arsenic	2.1E-08	9.15E-07	1.0E-10	1.8E+00	1.8E-10
Beryllium	2.2E-09	4.09E-08	4.5E-12	4.3E+00	1.9E-11
Lead	3.7E-07	1.81E-05	2.0E-09		
Nickel	2.4E-08	1.15E-06	1.3E-10		
Benzo(a)anthracene	4.3E-09	5.10E-06	5.6E-10	7.3E-01	4.1E-10
Benzo(a)pyrene	3.1E-09	7.88E-05	8.7E-09	7.3E+00	6.4E-08
Benzo(b)fluoranthen	5.2E-10	1.38E-05	1.5E-09	7.3E-01	1.1E-09
Benzo(g,h,i)perylene	1.5E-08	2.72E-03	3.0E-07		
bis(2-Ethylhexyl)phthala	3.5E-08			1.4E-02	
Dibenzo(a,h)anthracene	6.4E-10	5.94E-05	6.6E-09	7.3E+00	4.8E-08
Dieldrin	9.5E-10			1.6E+01	
U-TOTAL	1.4E-05	2.78E-08	3.1E-12		
Phenanthrene	4.6E-06	8.07E-03			
				Total Pathway:	1.1E-07

1.8E-10
2.0E-11
4.1E-10
6.4E-08
1.1E-09
1.5E-14
4.8E-08
1.9E-12

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem: 3.2E-11 | Total Rad + Chem: 2.6E-12 | Total Rad + Chem: 4.2E-06 | **Total: 4.2E-06**

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TABLE B.3.2-28(a)
(continued)

Noncarcinogenic Hazard

Radiation Hazard

Ingestion of Surface Water					Dermal Contact/Surface Water	Ingestion of Fish					Total
Compound	Conc'n (pCi/L	Intake	RfD(o)	Hazard		Compound	Conc'n-Fish (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237	2.41E-05	6.6E-04				NP-237	2.41E-04				
PU-238	6.63E-07	1.8E-05				PU-238	1.66E-05				
RA-226	1.66E-04	4.5E-03				RA-226	8.30E-03				
RA-228	2.10E-05	5.7E-04			Not Applicable	RA-228	1.05E-03				
SR-90	3.54E-03	9.7E-02				SR-90	1.06E-01				
TC-99	5.06E-01	1.4E+01				TC-99	7.59E+00				
U-234	4.17E-03	1.1E-01				U-234	8.34E-03				
U-235/236	3.65E-04	1.0E-02				U-235/236	7.30E-04				
U-238	4.51E-03	1.2E-01				U-238	9.03E-03				

Total Pathway

Chemical Hazard

Ingestion of Surface Water					Dermal Contact/Surface Water				Ingestion of Fish					Total
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm	Hazard	Compound	Conc'n-Fish (pCi/kg)	Intake	RfD(o)	Hazard	
Arsenic	2.08E-08	7.4E-13	3.0E-04	2.5E-09	Arsenic	3.4E-13	2.9E-04	1.2E-09	Arsenic	9.15E-07	2.4E-10	3.0E-04	7.9E-07	7.9E-07
Beryllium	2.15E-09	7.7E-14	5.0E-03	1.5E-11	Beryllium	3.5E-14	5.0E-05	7.0E-10	Beryllium	4.09E-08	1.1E-11	5.0E-03	2.1E-09	2.8E-09
Lead	3.69E-07	1.3E-11			Lead	2.4E-14			Lead	1.81E-05	4.7E-09			
Nickel	2.44E-08	8.7E-13			Nickel	4.0E-13			Nickel	1.15E-06	3.0E-10			
Benzo(a)anthracene	4.32E-09	1.5E-13			Benzo(a)anthracene	5.7E-11			Benzo(a)anthracene	5.10E-06	1.3E-09			
Benzo(a)pyrene	3.09E-09	1.1E-13			Benzo(a)pyrene	6.1E-11			Benzo(a)pyrene	7.88E-05	2.0E-08			
Benzo(b)fluoranthen	5.24E-10	1.9E-14			Benzo(b)fluoranthen	1.0E-11			Benzo(b)fluoranthene	1.38E-05	3.6E-09			
Benzo(g,h,i)perylene	1.48E-08	5.3E-13			Benzo(g,h,i)perylene	1.3E-09			Benzo(g,h,i)perylene	2.72E-03	7.0E-07			
bis(2-Ethylhexyl)phthala	3.45E-08	1.2E-12			bis(2-Ethylhexyl)phthala	3.5E-12			bis(2-Ethylhexyl)phthala					
Dibenzo(a,h)anthracene	6.39E-10	2.3E-14			Dibenzo(a,h)anthracene	2.8E-11			Dibenzo(a,h)anthracene	5.94E-05	1.5E-08			
Dieldrin	9.50E-10	3.4E-14	5.0E-05	6.8E-10	Dieldrin	2.5E-13	5.0E-05	5.0E-09	Dieldrin			5.0E-05		5.7E-09
U-TOTAL	1.39E-05	5.0E-10	3.0E-03	1.7E-07	U-TOTAL	2.3E-10	1.5E-04	1.5E-06	U-TOTAL	2.78E-08	7.2E-12	3.0E-03	2.4E-09	1.7E-06
Phenanthrene	4.61E-06	1.6E-10			Phenanthrene	1.7E-08			Phenanthrene	8.07E-03	2.1E-06			
			Total Pathway	1.7E-07			Total Pathway:	1.5E-06				Total Pathway:	7.9E-07	

Total: 2.5E-06

TABLE B.3.2-28(b)

CURRENT/FUTURE GREAT MIAMI RIVER AGRICULTURAL USER

SOUTH FIELD: BEEF AND MILK (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	4.32E-07	8.0E-01	2.2E-10	1.8E-10	NP-237	4.05E-08	3.0E-04	2.2E-10	6.5E-14	1.8E-10
PU-238	9.69E-11	1.8E-04	2.2E-10	4.0E-14	PU-238	2.01E-11	1.5E-07	2.2E-10	3.2E-17	4.0E-14
RA-226	1.65E-05	3.1E+01	7.8E-10	2.4E-08	RA-226	3.05E-05	2.2E-01	7.8E-10	1.7E-10	2.4E-08
RA-228	1.55E-06	2.9E+00	1E-10	2.9E-10	RA-228	2.89E-06	2.1E-02	1.0E-10	2.1E-12	2.9E-10
SR-90	7.65E-04	1.4E+03	3.6E-11	5.1E-08	SR-90	3.89E-03	2.9E+01	3.6E-11	1.0E-09	5.2E-08
TC-99	1.77E+00	3.3E+06	1.3E-12	4.3E-06	TC-99	2.13E+00	1.6E+04	1.3E-12	2.0E-08	4.3E-06
U-234	2.43E-04	4.5E+02	1.6E-11	7.2E-09	U-234	7.55E-04	5.5E+00	1.6E-11	8.9E-11	7.3E-09
U-235/236	2.13E-05	4.0E+01	1.6E-11	6.3E-10	U-235/236	6.61E-05	4.9E-01	1.6E-11	7.8E-12	6.4E-10
U-238	2.63E-04	4.9E+02	2.8E-11	1.4E-08	U-238	8.17E-04	6.0E+00	2.8E-11	1.7E-10	1.4E-08
			Total Pathway:	4.4E-06				Total Pathway:	2.2E-08	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.51E-08	3.6E-11	1.8E+00	6.4E-11	Arsenic	1.06E-09	4.4E-12	1.8E+00	7.7E-12	7.1E-11
Beryllium	9.96E-10	1.0E-12	4.3E+00	4.4E-12	Beryllium	9.16E-13	3.8E-15	4.3E+00	1.6E-14	4.5E-12
Lead	3.40E-08	3.5E-11			Lead	2.92E-08	1.2E-10			
Nickel	4.26E-08	4.4E-11			Nickel	7.35E-09	3.0E-11			
Benzo(a)anthracene	1.54E-08	1.6E-11	7.3E-01	1.2E-11	Benzo(a)anthracene	5.05E-09	2.1E-11	7.3E-01	1.5E-11	2.7E-11
Benzo(a)pyrene	2.92E-08	3.0E-11	7.3E+00	2.2E-10	Benzo(a)pyrene	9.60E-09	3.9E-11	7.3E+00	2.9E-10	5.1E-10
Benzo(b)fluoranthene	5.12E-09	5.3E-12	7.3E-01	3.9E-12	Benzo(b)fluoranthene	1.68E-09	6.9E-12	7.3E-01	5.1E-12	8.9E-12
Benzo(g,h,i)perylene	1.81E-06	1.9E-09			Benzo(g,h,i)perylene	5.96E-07	2.4E-09			
bis(2-Ethylhexyl)phthalate	1.84E-06	1.9E-09	1.4E-02	2.7E-11	bis(2-Ethylhexyl)phthalate	6.00E-07	2.5E-09	1.4E-02	3.5E-11	6.1E-11
Dibenzo(a,h)anthracene	3.26E-08	3.4E-11	7.3E+00	2.5E-10	Dibenzo(a,h)anthracene	1.07E-08	4.4E-11	7.3E+00	3.2E-10	5.7E-10
Dieldrin	4.05E-12	4.2E-15	1.6E+01	6.7E-14	Dieldrin	1.29E-12	5.3E-15	1.6E+01	8.5E-14	1.5E-13
U-TOTAL	2.55E-08	2.6E-11			U-TOTAL	8.35E-09	3.4E-11			
Phenanthrene	1.24E-06	1.3E-09			Phenanthrene	4.12E-07	1.7E-09			
			Total Pathway:	5.8E-10				Total Pathway:	6.7E-10	
			Total Rad + Chem	4.4E-06				Total Rad + Chem	2.2E-08	*Total:* 4.4E-06

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TABLE B.3.2-28(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	4.3E-07				NP-237	4.05E-08				
PU-238	9.7E-11				PU-238	2.01E-11				
RA-226	1.7E-05				RA-226	3.05E-05				
RA-228	1.5E-06				RA-228	2.89E-06				
SR-90	7.7E-04				SR-90	3.89E-03				
TC-99	1.8E+00				TC-99	2.13E+00				
U-234	2.4E-04				U-234	7.55E-04				
U-235/236	2.1E-05				U-235/236	6.61E-05				
U-238	2.6E-04				U-238	8.17E-04				
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	3.5E-08	3.6E-11	3.0E-04	1.2E-07	Arsenic	1.06E-09	4.4E-12	3.0E-04	1.5E-08	1.4E-07
Beryllium	1.0E-09	1.0E-12	5.0E-03	2.1E-10	Beryllium	9.16E-13	3.8E-15	5.0E-03	7.5E-13	2.1E-10
Lead	3.4E-08	3.5E-11			Lead	2.92E-08	1.2E-10			
Nickel	4.3E-08	4.4E-11			Nickel	7.35E-09	3.0E-11			
Benzo(a)anthracene	1.5E-08	1.6E-11			Benzo(a)anthracene	5.05E-09	2.1E-11			
Benzo(a)pyrene	2.9E-08	3.0E-11			Benzo(a)pyrene	9.60E-09	3.9E-11			
Benzo(b)fluoranthene	5.1E-09	5.3E-12			Benzo(b)fluoranthene	1.68E-09	6.9E-12			
Benzo(g,h,i)perylene	1.8E-06	1.9E-09			Benzo(g,h,i)perylene	5.96E-07	2.4E-09			
bis(2-Ethylhexyl)phthalate	1.8E-06	1.9E-09			bis(2-Ethylhexyl)phthalate	6.00E-07	2.5E-09			
Dibenzo(a,h)anthracene	3.3E-08	3.4E-11			Dibenzo(a,h)anthracene	1.07E-08	4.4E-11			
Dieldrin	4.1E-12	4.2E-15	5.0E-05	8.4E-11	Dieldrin	1.29E-12	5.3E-15	5.0E-05	1.1E-10	1.9E-10
U-TOTAL	2.6E-08	2.6E-11	3.0E-03	8.8E-09	U-TOTAL	8.35E-09	3.4E-11	3.0E-03	1.1E-08	2.0E-08
Phenanthrene	1.2E-06	1.3E-09			Phenanthrene	4.12E-07	1.7E-09			
		Total Pathway:		1.3E-07			Total Pathway:		2.6E-08	
		Total Rad + Chem		1.3E-07			Total Rad + Chem		2.6E-08	*Total:* 1.6E-07

TABLE B.3.2-28(c)

CURRENT/FUTURE GREAT MIAMI AGRICULTURAL USER

SOUTH FIELD: HOME GROWN PRODUCE (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/g)	Intake	SF(o)	Risk	
NP-237	1.19E-07	2.4E-01	2.2E-10	5.2E-11	NP-237	1.19E-07	1.2E-01	2.2E-10	2.7E-11	7.9E-11
PU-238	3.25E-09	6.4E-03	2.2E-10	1.4E-12	PU-238	3.24E-09	3.4E-03	2.2E-10	7.4E-13	2.2E-12
RA-226	8.43E-07	1.7E+00	7.8E-10	1.3E-09	RA-226	8.43E-07	8.8E-01	7.8E-10	6.9E-10	2.0E-09
RA-228	1.03E-07	2.0E-01	1.0E-10	2.0E-11	RA-228	1.02E-07	1.1E-01	1.0E-10	1.1E-11	3.1E-11
SR-90	2.00E-05	3.9E+01	3.6E-11	1.4E-09	SR-90	1.99E-05	2.1E+01	3.6E-11	7.5E-10	2.2E-09
TC-99	2.64E-03	5.2E+03	1.3E-12	6.8E-09	TC-99	2.64E-03	2.8E+03	1.3E-12	3.6E-09	1.0E-08
U-234	2.04E-05	4.0E+01	1.6E-11	6.4E-10	U-234	2.04E-05	2.1E+01	1.6E-11	3.4E-10	9.9E-10
U-235/236	1.79E-06	3.5E+00	1.6E-11	5.6E-11	U-235/236	1.79E-06	1.9E+00	1.6E-11	3.0E-11	8.6E-11
U-238	2.21E-05	4.4E+01	2.8E-11	1.2E-09	U-238	2.21E-05	2.3E+01	2.8E-11	6.5E-10	1.9E-09
			Total Pathway:	1.1E-08				Total Pathway:	6.1E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	1.31E-07	1.4E-10	1.8E+00	2.5E-10	Arsenic	1.31E-07	7.7E-11	1.8E+00	1.3E-10	3.9E-10
Beryllium	1.15E-08	1.3E-11	4.3E+00	5.4E-11	Beryllium	1.15E-08	6.7E-12	4.3E+00	2.9E-11	8.3E-11
Lead	1.91E-06	2.1E-09			Lead	1.91E-06	1.1E-09			
Nickel	1.20E-07	1.3E-10			Nickel	1.20E-07	7.0E-11			
Benzo(a)anthracene	2.31E-08	2.5E-11	7.30E-01	1.9E-11	Benzo(a)anthracene	2.30E-08	1.3E-11	7.3E-01	9.8E-12	2.8E-11
Benzo(a)pyrene	1.59E-08	1.8E-11	7.3E+00	1.3E-10	Benzo(a)pyrene	1.58E-08	9.2E-12	7.3E+00	6.7E-11	2.0E-10
Benzo(b)fluoranthene	2.68E-09	2.9E-12	7.3E-01	2.2E-12	Benzo(b)fluoranthene	2.65E-09	1.5E-12	7.3E-01	1.1E-12	3.3E-12
Benzo(g,h,i)perylene	7.32E-08	8.1E-11			Benzo(g,h,i)perylene	7.26E-08	4.2E-11			
bis(2-Ethylhexyl)phthala	1.79E-07	2.0E-10	1.4E-02	2.8E-12	bis(2-Ethylhexyl)phthalat	1.79E-07	1.0E-10	1.4E-02	1.5E-12	4.2E-12
Dibenzo(a,h)anthracene	3.21E-09	3.5E-12	7.3E+00	2.6E-11	Dibenzo(a,h)anthracene	3.19E-09	1.9E-12	7.3E+00	1.4E-11	3.9E-11
Dieldrin	1.90E-08	2.1E-11	1.6E+01	3.4E-10	Dieldrin	1.90E-08	1.1E-11	1.6E+01	1.8E-10	5.1E-10
U-TOTAL	6.80E-05	7.5E-08			U-TOTAL	6.80E-05	4.0E-08			
Phenanthrene	2.43E-05	2.7E-08			Phenanthrene	2.37E-05	1.4E-08			
			Total Pathway:	8.2E-10				Total Pathway:	4.3E-10	
			Total Rad + Chem	1.2E-08				Total Rad + Chem	6.5E-09	*Total:* 1.9E-08

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TABLE B.3.2-28(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.2E-07			
PU-238	3.2E-09			
RA-226	8.4E-07			
RA-228	1.0E-07			
SR-90	2.0E-05			
TC-99	2.6E-03			
U-234	2.0E-05			
U-235/236	1.8E-06			
U-238	2.2E-05			

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19E-07			
PU-238	3.24E-09			
RA-226	8.43E-07			
RA-228	1.02E-07			
SR-90	1.99E-05			
TC-99	2.64E-03			
U-234	2.04E-05			
U-235/236	1.79E-06			
U-238	2.21E-05			

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.3E-07	1.4E-10	3.0E-04	4.8E-07
Beryllium	1.1E-08	1.3E-11	5.0E-03	2.5E-09
Lead	1.9E-06	2.1E-09		
Nickel	1.2E-07	1.3E-10		
Benzo(a)anthracene	2.3E-08	2.5E-11		
Benzo(a)pyrene	1.6E-08	1.8E-11		
Benzo(b)fluoranthene	2.7E-09	2.9E-12		
Benzo(g,h,i)perylene	7.3E-08	8.1E-11		
bis(2-Ethylhexyl)phth	1.8E-07	2.0E-10		
Dibenzo(a,h)anthrace	3.2E-09	3.5E-12		
Dieldrin	1.9E-08	2.1E-11	5.0E-05	4.2E-07
U-TOTAL	6.8E-05	7.5E-08	3.0E-03	2.5E-05
Phenanthrene	2.4E-05	2.7E-08		

Total Pathway: 2.6E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.31E-07	7.7E-11	3.0E-04	2.6E-07
Beryllium	1.15E-08	6.7E-12	5.0E-03	1.3E-09
Lead	1.91E-06	1.1E-09		
Nickel	1.20E-07	7.0E-11		
Benzo(a)anthracene	2.30E-08	1.3E-11		
Benzo(a)pyrene	1.58E-08	9.2E-12		
Benzo(b)fluoranthene	2.65E-09	1.5E-12		
Benzo(g,h,i)perylene	7.26E-08	4.2E-11		
bis(2-Ethylhexyl)phth	1.79E-07	1.0E-10		
Dibenzo(a,h)anthrace	3.19E-09	1.9E-12		
Dieldrin	1.90E-08	1.1E-11	5.0E-05	2.2E-07
U-TOTAL	6.80E-05	4.0E-08	3.0E-03	1.3E-05
Phenanthrene	2.37E-05	1.4E-08		

Total Pathway: 1.4E-05

Total
7.4E-07
3.9E-09
6.4E-07
3.8E-05

Total Rad + Chem 2.6E-05

Total Rad + Chem 1.4E-05 *Total:* 4.0E-05

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TABLE B.3.2-28(d)
CURRENT/FUTURE GREAT MIAMI RIVER RESIDENTIAL USER, ADULT
SOUTH FIELD: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Radiation Risk

Inhalation of Surface Water				Ingestion of Surface Water					Dermal Contact/Surface Water				Total
Compound	Intake	SF(i)	Risk	Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk					
				NP-237	2.4E-05	1.2E+00	2.2E-10	2.6E-10					2.6E-10
				PU-238	6.6E-07	3.2E-02	2.2E-10	7.1E-12					7.1E-12
				RA-226	1.7E-04	8.1E+00	7.8E-10	6.3E-09					6.3E-09
Not applicable				RA-228	2.1E-05	1.0E+00	1.0E-10	1.0E-10	Not Applicable				1.0E-10
				SR-90	3.5E-03	1.7E+02	3.6E-11	6.2E-09					6.2E-09
				TC-99	5.1E-01	2.5E+04	1.3E-12	3.2E-08					3.2E-08
				U-234	4.2E-03	2.0E+02	1.6E-11	3.3E-09					3.3E-09
				U-235/236	3.7E-04	1.8E+01	1.6E-11	2.9E-10					2.9E-10
				U-238	4.5E-03	2.2E+02	2.8E-11	6.2E-09					6.2E-09
Total Pathway:				Total Pathway				5.5E-08	Total Pathway:				

Inhalation of Surface Water				Ingestion of Surface Water					Dermal Contact/Surface Water				
Compound	Intake	SF(i)	Risk	Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	2.1E-09			Arsenic	2.1E-08	5.7E-10	1.8E+00	1.0E-09	Arsenic	1.6E-12	1.8E+00	3.0E-12	1.0E-09
Beryllium	2.2E-10			Beryllium	2.2E-09	5.9E-11	4.3E+00	2.5E-10	Beryllium			2.5E-10	5.1E-10
Lead	3.8E-08			Lead	3.7E-07	1.0E-08			Lead	1.2E-13			
Nickel	2.5E-09			Nickel	2.4E-08	6.7E-10			Nickel	1.9E-12			
Benzo(a)anthracene	4.4E-10	6.1E-01	2.7E-10	Benzo(a)anthracene	4.3E-09	1.2E-10	7.3E-01	8.6E-11	Benzo(a)anthracene			8.6E-11	4.4E-10
Benzo(a)pyrene	3.2E-10	6.1E+00	1.9E-09	Benzo(a)pyrene	3.1E-09	8.5E-11	7.3E+00	6.2E-10	Benzo(a)pyrene			6.2E-10	3.2E-09
Benzo(b)fluoranthene	5.4E-11	6.1E-01	3.3E-11	Benzo(b)fluoranthene	5.2E-10	1.4E-11	7.3E-01	1.0E-11	Benzo(b)fluoranthene			1.0E-11	5.4E-11
Benzo(g,h,i)perylene	1.5E-09			Benzo(g,h,i)perylene	1.5E-08	4.1E-10			Benzo(g,h,i)perylene	6.3E-09			
bis(2-Ethylhexyl)phthala	3.5E-09			bis(2-Ethylhexyl)phthala	3.5E-08	9.5E-10	1.4E-02	1.3E-11	bis(2-Ethylhexyl)phthalat	1.7E-11	1.4E-02	1.3E-11	2.6E-11
Dibenzo(a,h)anthracene	6.6E-11	6.1E+00	4.0E-10	Dibenzo(a,h)anthracene	6.4E-10	1.8E-11	7.3E+00	1.3E-10	Dibenzo(a,h)anthracene			1.3E-10	6.6E-10
Dieldrin	9.8E-11	1.6E+01	1.6E-09	Dieldrin	9.5E-10	2.6E-11	1.6E+01	4.2E-10	Dieldrin	1.2E-12	1.6E+01	1.9E-11	2.0E-09
U-TOTAL	1.4E-06			U-TOTAL	1.4E-05	3.8E-07			U-TOTAL	1.1E-09			
Phenanthrene	4.7E-07			Phenanthrene	4.6E-06	1.3E-07							
	Total Pathway		4.2E-09		Total Pathway			2.5E-09		Total Pathway		1.1E-09	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	4.2E-09	Total Rad + Chem	5.7E-08	Total Rad + Chem	1.1E-09	**Total:**	6.3E-08

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TABLE B.3.2-28(d)
(continued)

Noncarcinogenic Hazard

Radiation Hazard

Inhalation of Surface Water				Ingestion of Surface Water					Dermal Contact/Surface Water				Total
Compound	Intake	RfD(i)	Hazard	Compound	Conc'n (pCi/L	Intake	RfD(o)	Hazard					
				NP-237	2.41E-05	1.2E+00							
				PU-238	6.63E-07	3.2E-02							
				RA-226	1.66E-04	8.1E+00							
Not applicable				RA-228	2.10E-05	1.0E+00			Not Applicable				
				SR-90	3.54E-03	1.7E+02							
				TC-99	5.06E-01	2.5E+04							
				U-234	4.17E-03	2.0E+02							
				U-235/236	3.65E-04	1.8E+01							
				U-238	4.51E-03	2.2E+02							
Total Pathway:				Total Pathway									

Chemical Hazard

Inhalation of Surface Water				Ingestion of Surface Water					Dermal Contact/Surface Water				
Compound	Intake	RfD(i)	Hazard	Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	2.1E-09			Arsenic	2.08E-08	5.7E-10	3.0E-04	1.9E-06	Arsenic	1.6E-12	2.9E-04	5.7E-09	1.9E-06
Beryllium	2.2E-10			Beryllium	2.15E-09	5.9E-11	5.0E-03	1.2E-08	Beryllium	1.7E-13	5.0E-05	3.4E-09	1.5E-08
Lead	3.8E-08			Lead	3.69E-07	1.0E-08			Lead	1.2E-13			
Nickel	2.5E-09			Nickel	2.44E-08	6.7E-10			Nickel	1.9E-12			
Benzo(a)anthracene	4.4E-10			Benzo(a)anthracene	4.32E-09	1.2E-10			Benzo(a)anthracene	2.8E-10			
Benzo(a)pyrene	3.2E-10			Benzo(a)pyrene	3.09E-09	8.5E-11			Benzo(a)pyrene	2.9E-10			
Benzo(b)fluoranthene	5.4E-11			Benzo(b)fluoranthene	5.24E-10	1.4E-11			Benzo(b)fluoranthene	5.0E-11			
Benzo(g,h,i)perylene	1.5E-09			Benzo(g,h,i)perylene	1.48E-08	4.1E-10			Benzo(g,h,i)perylene	6.3E-09			
bis(2-Ethylhexyl)phthalat	3.5E-09			bis(2-Ethylhexyl)phthalat	3.45E-08	9.5E-10			bis(2-Ethylhexyl)phthalat	1.7E-11			
Dibenzo(a,h)anthracene	6.6E-11			Dibenzo(a,h)anthracene	6.39E-10	1.8E-11			Dibenzo(a,h)anthracene	1.4E-10			
Dieldrin	9.8E-11			Dieldrin	9.50E-10	2.6E-11	5.0E-05	5.2E-07	Dieldrin	1.2E-12	5.0E-05	2.4E-08	5.4E-07
U-TOTAL	1.4E-06			U-TOTAL	1.39E-05	3.8E-07	3.0E-03	1.3E-04	U-TOTAL	1.1E-09	1.5E-04	7.3E-06	1.3E-04
Phenanthrene	4.7E-07			Phenanthrene	4.61E-06	1.3E-07			Phenanthrene	8.4E-08			
Total Pathway				Total Pathway				1.3E-04	Total Pathway:			7.3E-06	
Total Rad + Chem				Total Rad + Chem				1.3E-04	Total Rad + Chem			7.3E-06	Total: 1.4E-04

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TABLE B.3.3-2(a)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	N	7	7	1430	10100	–	–	6780	9033	–[e]	–	N	N	ND[g]	A, B	N	9033
Arsenic	mg/kg	U	7	7	1.9	33.2	–	–	8.729	–	–	–	N	Y	0.0366		Y	33.20
Barium	mg/kg	N	7	7	7.3	105	–	–	62.56	85.67	–	–	N	Y	1890	G	N	85.67
Beryllium	mg/kg	L	7	6	0.61	2.1	0.33	0.33	–	–	0.8985	2.273	Y	–	0.0149		Y	2.273
Cadmium	mg/kg	U	7	1	3.1	3.1	0.83	1.7	0.9664	–	–	–	Y	–	27	G	N	3.100
Calcium	mg/kg	N	7	7	2730	142000	–	–	81290	111853	–	–	Y	–	ND	D	N	111853
Chromium	mg/kg	N	7	7	2.5	12.9	–	–	8.857	11.360	–	–	N	N	135	A, B	N	11.36
Cobalt	mg/kg	N	7	7	2.9	10.2	–	–	5.886	7.889	–	–	N	N	1620	A, B	N	7.889
Copper	mg/kg	L	7	7	4.8	41.1	–	–	–	–	16.02	33.95	Y	–	999	G	N	33.95
Cyanide	mg/kg	U	7	3	0.14	0.7	0.11	0.13	0.1800	–	–	–	N	Y	540	G	N	0.7000
Iron	mg/kg	N	7	7	2770	17000	–	–	11017	15061	–	–	N	N	ND	A, B	N	15061
Lead	mg/kg	N	7	7	3.2	31.3	–	–	17.43	23.93	–	–	N	Y	ND		Y	23.93
Magnesium	mg/kg	N	7	7	741	55000	–	–	24677	37530	–	–	Y	–	262000	G	N	37530
Manganese	mg/kg	N	7	7	38	1020	–	–	440.1	656.0	–	–	N	N	3780	A, B	N	656.0
Molybdenum	mg/kg	U	7	3	4.8	7.2	3.3	5	3.714	–	–	–	Y	–	135	G	N	7.200
Nickel	mg/kg	N	7	7	5.8	19.7	–	–	13.56	17.33	–	–	N	N	540	A, B	N	17.33
Potassium	mg/kg	N	7	7	221	2030	–	–	1296	1723	–	–	Y	–	ND	D	N	1723
Selenium	mg/kg	U	7	1	8.2	8.2	0.36	0.7	1.381	–	–	–	N	Y	135	G	N	8.200
Silicon	mg/kg	L	7	7	219	1220	–	–	–	–	679.3	1265	N	N	ND	A, B	N	1265
Silver	mg/kg	N	7	5	2.8	5	1.7	3.3	3.229	4.386	–	–	Y	–	135	G	N	4.386
Sodium	mg/kg	N	7	7	74.5	223	–	–	126.5	165.0	–	–	Y	–	ND	D	N	165.0
Vanadium	mg/kg	N	7	7	4.9	32.3	–	–	19.24	25.57	–	–	N	Y	189	G	N	25.57
Zinc	mg/kg	N	7	7	12.6	55.1	–	–	36.97	47.82	–	–	N	N	8100	A, B	N	47.82
CS-137	pci/g	U	7	3	0.297	0.641	0.0623	0.344	0.2532	–	–	–	N	N	--[i]	A, B	N	0.6410
GROSS ALPHA	pci/g	N	7	6	20.1	60.2	9.42	9.42	30.87	43.63	–	–	•[f]	–	ND		N[h]	43.63
GROSS BETA	pci/g	N	7	7	11.9	43.9	–	–	30.53	38.31	–	–	•	–	ND		N[h]	38.31
NP-237	pci/g	U	4	4	0.298	0.137	–	–	–	–	–	–	•	–	--		Y	0.137
PU-238	pci/g	U	6	3	0.0441	0.081	0.0132	0.0554	–	–	–	–	•	–	--		Y	0.081
PU-239/240	pci/g	U	6	3	0.0205	0.0205	0.0239	0.0673	–	–	–	–	•	–	--		Y	0.021
RA-226	pci/g	L	7	7	0.523	2.7	–	–	–	–	1.217	1.975	N	Y	--		Y	1.975
RA-228	pci/g	L	7	7	0.415	2.62	–	–	–	–	1.208	2.242	N	Y	--		Y	2.242
SR-90	pci/g	N	7	5	0.525	1.14	0.345	0.5	0.6201	0.8698	–	–	Y	–	--		Y	0.8698
TH-228	pci/g	U	2	2	0.79	2.71	–	–	1.750	–	–	–	•	Y	--		Y	2.710
TH-230	pci/g	U	2	2	2.2	2.77	–	–	2.485	–	–	–	•	Y	--		Y	2.770
TH-232	pci/g	U	2	2	0.841	2.33	–	–	1.586	–	–	–	•	Y	--		Y	2.330
TH-TOTAL	mg/kg	U	2	2	7.74	21.4	–	–	14.57	–	–	–	•	Y	ND		Y	21.40
U-234	pci/g	N	7	6	1.32	10.6	0.433	0.433	5.602	8.652	–	–	Y	–	--		Y	8.652
U-235/236	pci/g	U	7	1	0.602	0.602	0.038	0.433	0.1771	–	–	–	N	Y	--		Y	0.6020
U-238	pci/g	N	7	6	1.44	11.2	0.422	0.422	5.702	8.870	–	–	Y	–	--		Y	8.870
U-TOTAL	mg/kg	N	7	6	5.01	32.1	0.824	0.824	17.29	26.21	–	–	•	–	81	G	N	26.21
2-Methylnaphthalene	mg/kg	U	7	1	0.16	0.16	0.36	0.56	0.207	–	–	–	–	–	ND		Y	0.16
Acenaphthene	mg/kg	U	7	1	0.46	0.46	0.36	0.56	0.250	–	–	–	–	–	1620	G	N	0.46
Acenaphthylene	mg/kg	U	7	1	1.8	1.8	0.36	0.56	0.442	–	–	–	–	–	1620	G	N	1.8
Anthracene	mg/kg	U	7	1	1.7	1.7	0.36	0.56	0.427	–	–	–	–	–	8100	G	N	1.7
Carbazole	mg/kg	U	7	1	0.51	0.51	0.36	0.56	0.257	–	–	–	–	–	3.2	G	N	0.51

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TABLE B.3.3-2(a)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Dibenzo(a,h)anthracene	mg/kg	U	7	1	2.2	2.2	0.36	0.56	0.499	–	–	–	–	–	0.00877		Y	2.2
Dibenzofuran	mg/kg	U	7	1	0.25	0.25	0.36	0.56	0.220	–	–	–	–	–	108	G	N	0.25
Fluorene	mg/kg	U	7	1	0.51	0.51	0.36	0.56	0.257	–	–	–	–	–	1080	C	N	0.51
Naphthalene	mg/kg	U	7	1	0.1	0.1	0.36	0.56	0.199	–	–	–	–	–	1080	G	N	0.1
2-Butanone	mg/kg	U	7	1	0.003	0.003	0.011	0.017	0.005	–	–	–	–	–	16200	G	N	0.003
Acetone	mg/kg	U	7	3	0.002	0.012	0.011	0.017	0.007	–	–	–	–	–	2700	G	N	0.012
Toluene	mg/kg	U	7	3	0.003	0.055	0.012	0.013	0.012	–	–	–	–	–	5400	G	N	0.055

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] • Insufficient data to screen against background
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[j] Summary of Screening Criteria:
(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B.3.3-2(b)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile/South Field: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	NPar.95	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg, pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg, pCi/g)
Aluminum	mg/kg	N	93	93	2130	22800	–	–	9360	10072	–[e]	–		N	–	ND[g]	A	N	10072
Antimony	mg/kg	U	69	17	1.2	29.7	0.24	13.8	3.74	–	–	–	18.7	N	–	10.8	A	N	18.70
Arsenic	mg/kg	L	93	93	1.5	81.8	–	–	–	–	10.22	12.06		Y	–	0.0366		Y	12.06
Barium	mg/kg	L	93	93	8	1080	–	–	–	–	146.9	181.3		Y	–	1890	G	N	181.3
Beryllium	mg/kg	L	93	76	0.31	8.7	0.39	1.7	–	–	1.212	1.438		Y	–	0.0149		Y	1.438
Boron	mg/kg	N	7	5	17.1	36	22.7	23.1	23.36	30.75	–	–		N	N	2430	A, B	N	30.75
Cadmium	mg/kg	L	93	33	0.47	4.9	0.41	4.4	–	–	1.034	1.216		Y	–	27	G	N	1.216
Calcium	mg/kg	L	93	93	1620	252000	–	–	–	–	83986	124191		N	–	ND	A	N	124191
Chromium	mg/kg	L	93	91	3.6	36.2	5	7.7	–	–	15.06	16.77		Y	–	135	G	N	16.77
Cobalt	mg/kg	N	93	88	3	23.2	5	9.5	8.71	9.37	–	–		N	–	1620	A	N	9.369
Copper	mg/kg	L	93	91	7	436	7.7	9.3	–	–	25.90	29.81		Y	–	999	G	N	29.81
Cyanide	mg/kg	U	90	29	0.12	2.6	0.1	0.3	0.210	–	–	–	0.78	Y	–	540	G	N	0.780
Iron	mg/kg	N	93	93	3430	44100	–	–	17834	19229	–	–		N	–	ND	A	N	19229
Lead	mg/kg	L	93	93	3.3	1140	–	–	–	–	22.44	28.08		Y	–	ND		Y	28.08
Magnesium	mg/kg	N	93	93	377	55900	–	–	16545	18890	–	–		N	–	262000	A	N	18890
Manganese	mg/kg	N	93	93	22.7	1200	–	–	479.60	525.3	–	–		N	–	3780	A	N	525.3
Mercury	mg/kg	U	90	16	0.12	1.3	0.09	0.19	0.111	–	–	–	0.44	Y	–	8.1	G	N	0.440
Molybdenum	mg/kg	N	93	67	0.72	17.5	1.1	17.5	5.98	6.69	–	–		Y	–	135	G	N	6.694
Nickel	mg/kg	L	93	89	8.1	82.3	10.1	17.5	–	–	21.30	23.45		N	–	540	A	N	23.45
Potassium	mg/kg	L	93	93	456	2900	–	–	–	–	1163	1260		N	–	ND	A	N	1260
Selenium	mg/kg	U	87	18	0.73	11.1	0.2	0.53	0.804	–	–	–	4.1	N	–	135	A	N	4.100
Silicon	mg/kg	L	72	72	5.5	3370	–	–	–	–	846.7	992.1		N	–	ND	A	N	992.1
Silver	mg/kg	N	93	64	0.49	16.2	0.41	8.7	4.60	5.24	–	–		Y	–	135	G	N	5.244
Sodium	mg/kg	L	93	89	37.5	663	71.9	237	–	–	171.0	191.7		Y	–	ND	D	N	191.7
Thallium	mg/kg	U	93	14	0.19	3.6	0.16	0.59	0.316	–	–	–	0.88	N	–	1.89	A	N	0.880
Vanadium	mg/kg	N	93	93	9.8	53.2	–	–	26.16	27.68	–	–		Y	–	189	G	N	27.68
Zinc	mg/kg	L	93	91	9.4	508	11.9	12.9	–	–	56.96	66.44		N	–	8100	A	N	66.44
CS-137	pci/g	U	116	9	0.165	0.55	0.07	0.95	0.101	–	–	–	0.237	Y	–	--[i]		Y	0.237
GROSS ALPHA	pci/g	L	67	62	7.81	2030	8.72	10.9	–	–	67.52	98.89		*[f]	–	ND		N[h]	98.89
GROSS BETA	pci/g	L	67	67	12.41	1810	–	–	–	–	67.00	87.98		*	–	ND		N[h]	87.98
NP-237	pci/g	U	105	9	0.116	37.3	0.03	6.53	0.604	–	–	–	0.3	*	–	--		Y	0.300
PB-210	pci/g	L	10	10	0.71	16.8	–	–	–	–	2.398	6.014		Y	–	--		Y	6.014
PU-238	pci/g	U	121	8	0.024	0.6	0.016	1.85	0.175	–	–	–	0.04	*	–	--		Y	0.040
PU-239/240	pci/g	U	118	6	0.0209	1.23	0.01	1.77	0.165	–	–	–	0.0209	*	–	--		Y	0.021
RA-224	pci/g	N	10	10	1.02	3.49	–	–	2.68	3.13	–	–		Y	–	--		Y	3.133
RA-226	pci/g	L	116	111	0.492	42.3	0.3	1.04	–	–	2.427	2.919		Y	–	--		Y	2.919
RA-228	pci/g	L	115	111	0.34	19	0.442	0.54	–	–	1.485	1.656		Y	–	--		Y	1.656
RU-106	pci/g	U	116	11	1	1.8	0.104	8.95	0.561	–	–	–	1.3	Y	–	--		Y	1.300
SR-90	pci/g	U	113	37	0.5	2.39	0.15	0.963	0.478	–	–	–	1.36	N	–	--	A	N	1.360
TC-99	pci/g	U	90	4	0.9	1.1	0.207	0.9	0.279	–	–	–	0.9	N	–	--	A	N	0.900
TH-228	pci/g	L	111	102	0.308	20.3	0.33	0.88	–	–	1.493	1.704		Y	–	--		Y	1.704
TH-230	pci/g	L	111	111	0.8	121	–	–	–	–	3.562	4.263		Y	–	--		Y	4.263
TH-232	pci/g	L	111	99	0.264	17.5	0.29	0.979	–	–	1.341	1.531		Y	–	--		Y	1.531
TH-TOTAL	mg/kg	L	108	108	2.41	158	–	–	–	–	12.27	13.65		*	Y	ND		Y	13.65
U-234	pci/g	L	121	114	0.6	1380	0.49	2.59	–	–	19.01	30.19		Y	–	--		Y	30.19
U-235	pci/g	L	10	6	0.57	12.7	0.4	3.3	–	–	2.887	17.06		*	–	--		Y	12.70
U-235/236	pci/g	U	121	40	0.04	68.8	0.0196	0.6	2.31	–	–	–	5.76	Y	–	--		Y	5.760
U-238	pci/g	L	121	117	0.385	1570	0.471	0.6	–	–	20.46	32.30		Y	–	--		Y	32.30
U-TOTAL	mg/kg	L	118	114	1.05	3580	2.62	31.72	–	–	69.22	104.4		*	–	81		Y	104.4
2-Methylnaphthalene	mg/kg	U	101	7	0.05	0.091	0.34	0.93	0.20321	–	–	–	0.056	–	–	ND		Y	0.056
4-Methylphenol	mg/kg	U	100	2	0.01	0.054	0.34	0.93	0.20919	–	–	–	0.01	–	–	0.016	G	N	0.01
Acenaphthylene	mg/kg	U	100	1	0.41	0.41	0.34	0.93	0.21505	–	–	–	0.41	–	–	8100	G	N	0.41
Anthracene	mg/kg	U	100	6	0.003	0.25	0.34	0.93	0.20536	–	–	–	0.049	–	–	8100	G	N	0.049
Benzo(a)anthracene	mg/kg	U	100	15	0.008	1.1	0.34	0.93	0.20563	–	–	–	0.13	–	–	0.0877		Y	0.13
Benzo(a)pyrene	mg/kg	U	99	13	0.003	1.8	0.34	0.93	0.21220	–	–	–	0.11	–	–	0.00877		Y	0.11

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TABLE B.3.3-2(b)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile/South Field: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	NPar.95	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg, pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg, pCi/g)
Benzo(b)fluoranthene	mg/kg	U	99	13	0.005	1.6	0.34	0.93	0.21867	–	–	–	0.14	–	–	0.0877		Y	0.14
Benzo(g,h,i)perylene	mg/kg	U	99	9	0.004	1.2	0.34	0.93	0.21087	–	–	–	0.059	–	–	ND		Y	0.059
Benzo(k)fluoranthene	mg/kg	U	99	10	0.006	1.6	0.34	0.93	0.21475	–	–	–	0.084	–	–	0.877	G	N	0.084
Benzoic acid	mg/kg	U	82	11	0.044	0.15	1.7	4.2	0.90693	–	–	–	0.057	–	–	108000	G	N	0.057
Carbazole	mg/kg	U	73	2	0.001	0.051	0.34	0.57	0.19913	–	–	–	0.001	–	–	3.2	G	N	0.001
Chrysene	mg/kg	U	100	15	0.008	1.4	0.34	0.93	0.21011	–	–	–	0.15	–	–	8.77	G	N	0.15
Di-n-butyl phthalate	mg/kg	U	100	6	0.043	0.11	0.051	0.93	0.20212	–	–	–	0.046	–	–	2700	G	N	0.046
Di-n-octyl phthalate	mg/kg	U	100	1	0.21	0.21	0.34	0.93	0.2129	–	–	–	0.21	–	–	540	G	N	0.21
Dibenzo(a,h)anthracene	mg/kg	U	99	2	0.002	0.44	0.34	0.93	0.21320	–	–	–	0.002	–	–	0.00877	G	N	0.002
Diethyl phthalate	mg/kg	U	101	3	0.052	0.18	0.34	0.93	0.20976	–	–	–	0.052	–	–	21600	G	N	0.052
Fluoranthene	mg/kg	U	101	19	0.016	1.8	0.34	0.93	0.22246	–	–	–	0.26	–	–	1080	G	N	0.26
Indeno(1,2,3-cd)pyrene	mg/kg	U	99	7	0.004	0.21	0.34	0.93	0.20349	–	–	–	0.046	–	–	0.0877	G	N	0.046
Isophorone	mg/kg	U	100	1	0.004	0.004	0.34	0.93	0.21084	–	–	–	0.004	–	–	15.6	G	N	0.004
Naphthalene	mg/kg	U	100	4	0.053	0.081	0.34	0.93	0.20698	–	–	–	0.053	–	–	1080	G	N	0.053
Phenanthrene	mg/kg	U	100	18	0.01	0.37	0.34	0.93	0.1997	–	–	–	0.21	–	–	ND		Y	0.21
Phenol	mg/kg	U	100	1	0.002	0.002	0.34	0.93	0.21082	–	–	–	0.002	–	–	16200	G	N	0.002
Pyrene	mg/kg	U	103	22	0.014	1.4	0.34	0.93	0.21069	–	–	–	0.22	–	–	810	G	N	0.22
Tributyl phosphate	mg/kg	U	17	3	0.002	0.2	0.35	0.44	0.19041	–	–	–	0.2	–	–	ND		Y	0.2
bis(2-Ethylhexyl) phthalate	mg/kg	U	99	39	0.002	2.8	0.34	0.93	0.26883	–	–	–	0.86	–	–	4.57	G	N	0.86
1,1,1-Trichloroethane	mg/kg	U	102	19	0.001	0.92	0.005	1.6	0.02875	–	–	–	0.05	–	–	2430	G	N	0.05
2-Butanone	mg/kg	U	99	6	0.001	0.042	0.006	1.6	0.01562	–	–	–	0.002	–	–	16200	G	N	0.002
2-Hexanone	mg/kg	U	91	1	0.003	0.003	0.006	1.6	0.01592	–	–	–	0.003	–	–	1080	G	N	0.003
4-Methyl-2-pentanone	mg/kg	U	92	6	0.001	0.006	0.007	1.6	0.01565	–	–	–	0.001	–	–	1350	G	N	0.001
Acetone	mg/kg	U	100	34	0.003	0.19	0.01	1.6	0.02144	–	–	–	0.056	–	–	2700	G	N	0.056
Carbon disulfide	mg/kg	U	101	3	0.002	0.02	0.005	1.6	0.01415	–	–	–	0.002	–	–	2700	G	N	0.002
Chlorobenzene	mg/kg	U	90	1	0.014	0.014	0.005	1.6	0.01494	–	–	–	0.014	–	–	540	G	N	0.014
Chloroform	mg/kg	U	100	2	0.003	0.007	0.005	1.6	0.01419	–	–	–	0.003	–	–	10.5	G	N	0.003
Chloromethane	mg/kg	U	100	1	0.052	0.052	0.01	1.6	0.01563	–	–	–	0.052	–	–	4.92	G	N	0.052
Methylene chloride	mg/kg	U	101	9	0.002	0.18	0.005	0.089	0.01328	–	–	–	0.054	–	–	8.53	G	N	0.054
Styrene	mg/kg	U	91	1	0.002	0.002	0.005	1.6	0.01510	–	–	–	0.002	–	–	2.13	G	N	0.002
Tetrachloroethene	mg/kg	U	91	1	0.001	0.001	0.005	1.6	0.01504	–	–	–	0.001	–	–	1.23	G	N	0.001
Toluene	mg/kg	U	97	43	0.001	1.8	0.005	0.37	0.04526	–	–	–	0.11	–	–	5400	G	N	0.11
Trichloroethene	mg/kg	U	95	1	0.002	0.002	0.005	1.6	0.01467	–	–	–	0.002	–	–	5.82	G	N	0.002
Vinyl Acetate	mg/kg	U	87	1	0.002	0.002	0.01	0.083	0.00633	–	–	–	0.002	–	–	27000	G	N	0.002
Xylenes, Total	mg/kg	U	90	2	0.001	0.002	0.005	1.6	0.01521	–	–	–	0.001	–	–	54000	G	N	0.001
Total Organic Carbon	mg/kg	N	6	6	7.84	192.011	–	–	104.696	177.7503	–	–	0	–	–	ND	F	N	177.750329
Octachlorodibenzo-p-dioxin	mg/kg	L	10	10	0.00012	0.0036	–	–	–	–	0.00132501	0.004496	0	–	–	0.000427		Y	0.0036
Tetrachlorodibenzofuran	mg/kg	U	10	1	0.00001	0.000018	0.00002	0.00017	0.00002	–	–	–	0.000018	–	–	0.00000427		Y	0.000018
Aroclor-1254	mg/kg	U	101	23	0.032	1.1	0.034	0.37	0.09114	–	–	–	0.43	–	–	0.00831		Y	0.43
Aroclor-1260	mg/kg	U	101	2	0.089	0.39	0.034	1.8	0.06508	–	–	–	0.089	–	–	0.00831		Y	0.089
Dieldrin	mg/kg	U	100	1	0.016	0.016	0.0034	0.18	0.00643	–	–	–	0.016	–	–	0.004		Y	0.016
Endrin ketone	mg/kg	U	100	1	0.0053	0.0053	0.0034	0.18	0.00632	–	–	–	0.0053	–	–	8.1	G	N	0.0053
alpha-Chlordane	mg/kg	U	100	2	0.0033	0.008	0.0018	0.92	0.02514	–	–	–	0.0033	–	–	0.0492	G	N	0.0033
gamma-Chlordane	mg/kg	U	100	1	0.0072	0.0072	0.0018	0.92	0.02511	–	–	–	0.0072	–	–	0.0492	G	N	0.0072

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retained as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.

TABLE B.3.3-2(b)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile/South Field: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est. Mean	UCL(L)	NPar.95	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg, pCi/g)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg, pCi/g)

[i] No data available to calculate EPA RAGs, Part B screening value.

[j] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

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TABLE B.3.3-2(c)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile: Seeps

Parameter	Units	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Average	EPA RAGs[a] Residential Tap Water (mg/L)	Reason for Elimination	Final CPC[b]	Conc. Term (mg/L; pCi/L)
Aluminum	mg/l	2	2	0.0828	0.131	–[c]	–	106.9	ND[d]	B	N	0.131
Arsenic	mg/l	3	1	0.0014	0.0014	0.002	0.002	1.13	0.000000146		Y	0.0014
Barium	mg/l	3	3	0.0267	0.0661	–	–	44.6	0.256	E	N	0.0661
Cadmium	mg/l	3	1	0.0016	0.0016	0.002	0.005	1.70	0.00000036		Y	0.0016
Calcium	mg/l	3	3	38.3	132	–	–	84300	ND	B	N	132
Iron	mg/l	3	2	0.0729	0.284	0.0041	0.0041	119.6	ND	B	N	0.284
Lead	mg/l	3	1	0.0083	0.0083	0.001	0.002	3.27	ND		Y	0.0083
Magnesium	mg/l	3	3	10.1	45.7	–	–	26867	35.4	B	N	45.7
Manganese	mg/l	3	3	0.0128	0.0462	–	–	27.2	0.511	E	N	0.0462
Mercury	mg/l	3	1	0.0008	0.0008	0.0002	0.0002	0.333	0.00109	E	N	0.0008
Nickel	mg/l	3	1	0.008	0.008	0.003	0.02	6.50	0.0000027		Y	0.008
Potassium	mg/l	3	3	1.74	2.33	–	–	1967	ND	B	N	2.33
Selenium	mg/l	3	1	0.004	0.004	0.002	0.002	2.00	ND		Y	0.004
Silicon	mg/l	2	2	5.76	7.04	–	–	6400	ND	C	N	7.04
Sodium	mg/l	3	3	1.99	6.01	–	–	3573	ND	B	N	6.01
GROSS ALPHA	pci/l	3	3	19	426	–	–	172.6	ND		N[f]	426
GROSS BETA	pci/l	3	3	20	172	–	–	81.1	ND		N[f]	172
NP-237	pci/l	1	1	0.79	0.79	–	–	0.79	--[e]		Y	0.79
PU-238	pci/l	2	1	2.91	2.91	0.19	0.19	1.50	--		Y	2.91
PU-239/240	pci/l	2	1	0.2	0.2	0.052	0.052	0.113	--		Y	0.113
RA-226	pci/l	3	1	0.148	0.148	0.15	1	0.241	--		Y	0.241
TH-230	pci/l	2	2	0.34	0.653	–	–	0.497	--		Y	0.497
U-234	pci/l	2	2	61	265	–	–	163.0	--		Y	265
U-235/236	pci/l	2	2	2.9	14	–	–	8.45	--		Y	14
U-238	pci/l	2	2	59.7	257	–	–	158.4	--		Y	257
U-TOTAL	mg/l	3	3	0.04	0.82	–	–	0.342	0.0109		Y	0.82
bis(2-Ethylhexyl) phthalate	mg/l	2	1	0.001	0.001	0.01	0.01	0.003	0.000607		Y	0.001
Toluene	mg/l	2	1	0.002	0.002	0.01	0.01	0.004	0.0963	E	N	0.002
Alkalinity	mg/l	2	2	208	395	–	–	301.5	ND	D	N	395
Ammonia	mg/l	3	2	0.13	0.1626	0.1	0.1	0.114	ND	D	N	0.1626
Chloride	mg/l	3	3	2.33	4.63	–	–	3.49	ND	D	N	4.63
Fluoride	mg/l	3	3	0.23	0.39	–	–	0.307	0.291	D	N	0.39
Nitrate	mg/l	2	2	0.14	0.14	–	–	0.140	ND	D	N	0.14
Phosphorus	mg/l	1	1	0.842	0.842	–	–	0.842	ND	D	N	0.842
Sulfate	mg/l	3	3	67	171	–	–	124.0	0.365	D	N	171
Total Kjeldahl Nitrogen	mg/l	3	3	0.18	1.09	–	–	0.723	ND	D	N	1.09
Total Organic Carbon	mg/l	2	2	2.14	5.77	–	–	3.96	ND	D	N	5.77
Total Organic Halides	mg/l	3	2	0.0159	10.6	10	10	5.21	ND	D	N	10.6
Total Organic Nitrogen	mg/l	3	3	0.18	0.927	–	–	0.626	ND	D	N	0.927
Total Phosphorous	mg/l	2	2	0.18	0.19	–	–	0.185	ND	D	N	0.19

TABLE B.3.3-2(c)
Constituents of Potential Concern (CPCs)
Inactive Flyash Pile: Seeps

Parameter	Units	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Average	EPA RAGs[a] Residential Tap Water (mg/L)	Reason for Elimination	Final CPC[b]	Conc. Term (mg/L; pCi/L)

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)

[b] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria A through E) presented below.

[c] Not applicable.

[d] No data available to calculate EPA RAGs screening value.

[e] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retained as CPCs.

[f] Quantitative risk assessment not possible; qualitative use only.

[g] Summary of Toxicological Screening Criteria:

(A) Constituent was identified only once in one medium (i.e., not found in any other media).

(B) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).

(C) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).

(D) Constituent is within a nonspecific class of chemical compounds (e.g., TOC, TPH, PAH, CH, general aqueous chemistry).

(E) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

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TABLE B3.3-2d
INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	0.137		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.081		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.021		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.980		7.8E-10	7.0E-09	6.0E-06				
RA-228	2.240		1.0E-10	6.9E-10	2.9E-06				
SR-90	0.870		3.6E-11	6.2E-11					
TH-228	2.710		5.5E-11	7.8E-08	5.6E-06				
TH-230	2.770		1.3E-11	2.9E-08	5.4E-11				
TH-232	2.330		1.7E-10	1.1E-07	8.5E-06				
U-234	8.650		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.602		1.6E-11	2.5E-08	2.4E-07				
U-238	8.870		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	33.200	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	2.270	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Dibenzo(a,h)anthracen	2.200		7.30E+00	6.10E+00					
Lead	23.900	1.00E-02							
TH-TOTAL	21.400								
2-Methylnaphthalene	0.16	3.00E-01							

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TABLE B3.3-2d
INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

SURFACE WATER (non-GMR)									
	Current and Future								
Contaminant	onc'n (pCi/L	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	6.71E-01		2.2E-10	2.9E-08	4.3E-07				
PU-238	8.08E-01		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	5.82E-02		2.3E-10	3.8E-08	2.7E-11				
RA-226	3.60E-01		7.8E-10	7.0E-09	6.0E-06				
RA-228	3.63E-01		1.0E-10	6.9E-10	2.9E-06				
SR-90	1.41E-01		3.6E-11	6.2E-11	0.0E+00				
U-234	1.63E+02		1.6E-11	2.6E-08	3.0E-11				
U-235/236	1.01E+01		1.6E-11	2.5E-08	2.4E-07				
U-238	1.60E+02		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm
Arsenic	3.23E-03	1.00E-03	1.75E+00			1.84E+00	3.00E-04		2.85E-04
Beryllium	1.56E-04	1.00E-03	4.30E+00				5.00E-03		5.00E-05
Lead	1.30E-02	4.00E-06							
Dibenzo(a,h)anthracene	2.22E-05	########	7.30E+00	6.10E+00					
2-Methylnaphthalene	3.15E-03	1.42E-01							
U-TOTAL	4.96E-01	1.00E-03					3.00E-03		1.50E-04

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TABLE B3.3-2d
INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER										
	On-Site	FEMP Bdry								
Contaminant	onc'n (pCi/L	Conc'n (pCi/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	1.90E-02	2.81E-04		2.2E-10	2.9E-08	4.3E-07				
SR-90	2.72E-02	2.26E-03		3.6E-11	6.2E-11	0.0E+00				
TC-99	1.82E+00	9.81E-01		1.3E-12	8.3E-12	6.0E-13				
U-234	4.69E+02	2.40E+01		1.6E-11	2.6E-08	3.0E-11				
U-235/236	2.50E+01	1.28E+00		1.6E-11	2.5E-08	2.4E-07				
U-238	5.17E+02	2.65E+01		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/L)	(mg/L)	Kp					RfD(o)	RfD(i)	RfD(derm)
2-Methylnapht	7.17E-04	0.00E+00	1.42E-01							
Lead	1.43E-03	2.05E-17	4.00E-06							
Tributyl phosp	1.43E-03	0.00E+00	3.14E-02					5.00E-03		4.50E-03
U-TOTAL	1.84E+00	9.45E-02	1.00E-03					3.00E-03		1.50E-04
	t*	TAO								
Tributyl phosp	3.08E+01	3.67E+00								

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TABLE B3.3-2d
INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT			*future*		
	On-Subunit	On-Property	Off-Prop	On-Subunit	On-Property	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3)
NP-237	6.08E-07	7.29E-07	4.82E-08	6.08E-07	7.29E-07	4.82E-08
PU-238	3.60E-07	4.54E-07	2.92E-08	3.60E-07	4.54E-07	2.92E-08
PU-239/240	9.32E-08	1.18E-07	7.56E-09	9.32E-08	1.18E-07	7.56E-09
RA-226	8.79E-06	1.11E-05	7.11E-07	8.79E-06	1.11E-05	7.11E-07
RA-228	9.95E-06	1.26E-05	8.07E-07	9.95E-06	1.26E-05	8.07E-07
SR-90	3.86E-06	4.88E-06	3.13E-07	3.86E-06	4.88E-06	3.13E-07
TH-228	1.20E-05	1.52E-05	9.76E-07	1.20E-05	1.52E-05	9.76E-07
TH-230	1.23E-05	1.55E-05	9.97E-07	1.23E-05	1.55E-05	9.97E-07
TH-232	1.03E-05	1.31E-05	8.39E-07	1.03E-05	1.31E-05	8.39E-07
U-234	3.84E-05	4.85E-05	3.11E-06	3.84E-05	4.85E-05	3.11E-06
U-235/236	2.67E-06	3.38E-06	2.12E-07	2.67E-06	3.38E-06	2.12E-07
U-238	3.94E-05	4.98E-05	3.19E-06	3.94E-05	4.98E-05	3.19E-06
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3)
Arsenic	1.47E-07	1.86E-07	1.20E-08	1.47E-07	1.86E-07	1.20E-08
Beryllium	1.01E-08	1.27E-08	8.18E-10	1.01E-08	1.27E-08	8.18E-10
Dibenzo(a,h)anthra	9.77E-09	1.23E-08	7.74E-10	9.77E-09	1.23E-08	7.74E-10
Lead	1.06E-07	1.34E-07	8.61E-09	1.06E-07	1.34E-07	8.61E-09
TH-TOTAL	9.50E-08	1.20E-07	7.53E-09	9.50E-08	1.20E-07	7.53E-09
2-Methylnaphthalen	7.10E-10	8.98E-10	5.63E-11	7.10E-10	8.98E-10	5.63E-11

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TABLE B3.3-2d
INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

SEDIMENT								
	Current and Future							
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)			
NP-237	1.32E-01		2.2E-10	2.9E-08	4.3E-07			
PU-238	8.09E-02		2.2E-10	3.9E-08	2.8E-11			
PU-239/240	2.09E-02		2.3E-10	3.8E-08	2.7E-11			
RA-226	1.98E+00		7.8E-10	7.0E-09	6.0E-06			
RA-228	2.24E+00		1.0E-10	6.9E-10	2.9E-06			
SR-90	8.69E-01		3.6E-11	6.2E-11	0.0E+00			
U-234	7.71E+00		1.6E-11	2.6E-08	3.0E-11			
U-235/236	5.40E-01		1.6E-11	2.5E-08	2.4E-07			
U-238	7.93E+00		2.8E-11	5.2E-08	3.6E-08			
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SFderm	RfD(o)	fD(i	fD(derm
Arsenic	3.32E+01	1.00E-03	1.75E+00	1.50E+01	1.84E+00	3.00E-04		2.85E-04
Beryllium	2.27E+00	1.00E-02	4.30E+00	8.40E+00		5.00E-03		5.00E-05
Lead	2.38E+01	1.00E-02						
2-Methylnaphthalene	1.59E-01	3.00E-01						
Dibenzo(a,h)anthracen	2.20E+00		7.30E+00	6.10E+00				
U-Total	2.34E+01	1.00E-02				3.00E-03		1.50E-04

TABLE B3.3-2d
INACTIVE FLYASH PILE
EXPOSURE POINT CONCENTRATIONS

GMR SURFACE WATER									
Contaminant	Conc'n (pCi/	BCF	Kp	SF(o)					
NP-237	3.32E-06	1.00E-02		2.2E-10					
PU-238	3.99E-06	2.50E-02		2.2E-10					
PU-239/240	2.87E-07	2.50E-02		2.3E-10					
RA-226	1.77E-06	5.00E-02		7.8E-10					
RA-228	1.78E-06	5.00E-02		1.0E-10					
SR-90	6.90E-07	3.00E-02		3.6E-11					
U-234	7.98E-04	2.00E-03		1.6E-11					
U-235/236	4.96E-05	2.00E-03		1.6E-11					
U-238	7.98E-04	2.00E-03		2.8E-11					
CHEM	(mg/L)	BCF	Kp	SF(o)	SF(i)	SF(derm)	RfD(o)	RfD(derm)	
Arsenic	1.59E-08	4:40E+01	1.00E-03	1.75E+00		1.84E+00	3.00E-04	2.85E-04	
Beryllium	7.64E-10	1.90E+01	1.00E-03	4.30E+00			5.00E-03	5.00E-05	
Cadmium	2.36E-08	8.10E+01	1.00E-03				5.00E-04	2.50E-05	
Lead	6.40E-08	4.90E+01	4.00E-06						
Nickel	1.08E-08	4.70E+01	1.00E-03						
Dibenzo(a,h)anthracen	1.09E-10	9.30E+04	2.70E+00	7.30E+00	6.10E+00				
U-TOTAL	2.44E-06	2.00E-03	1.00E-03				3.00E-03	1.50E-04	
2-methylnaphthalene	1.54E-08	5.05E+02	1.42E-01						

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TABLE B.3.3-4
CURRENT, TRESPASSING YOUTH
INACTIVE FLYASH PILE: SURFACE SOIL

Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	6.08E-07	1.3E-03	2.9E-08	3.7E-11
PU-238	3.60E-07	7.5E-04	3.9E-08	2.9E-11
PU-239/240	9.32E-08	1.9E-04	3.8E-08	7.3E-12
RA-226	8.79E-06	1.8E-02	7.0E-09	1.3E-10
RA-228	9.95E-06	2.1E-02	6.9E-10	1.4E-11
SR-90	3.86E-06	8.0E-03	6.2E-11	5.0E-13
TH-228	1.20E-05	2.5E-02	7.8E-08	1.9E-09
TH-230	1.23E-05	2.5E-02	2.9E-08	7.4E-10
TH-232	1.03E-05	2.1E-02	1.1E-07	2.3E-09
U-234	3.84E-05	8.0E-02	2.6E-08	2.1E-09
U-235/236	2.67E-06	5.5E-03	2.5E-08	1.4E-10
U-238	3.94E-05	8.2E-02	5.2E-08	4.2E-09

Total Pathway: 1.2E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.37E-01	1.6E+00	2.2E-10	3.6E-10
PU-238	8.10E-02	9.6E-01	2.2E-10	2.1E-10
PU-239/240	2.10E-02	2.5E-01	2.3E-10	5.7E-11
RA-226	1.98E+00	2.3E+01	7.8E-10	1.8E-08
RA-228	2.24E+00	2.7E+01	1.0E-10	2.7E-09
SR-90	8.70E-01	1.0E+01	3.6E-11	3.7E-10
TH-228	2.71E+00	3.2E+01	5.5E-11	1.8E-09
TH-230	2.77E+00	3.3E+01	1.3E-11	4.3E-10
TH-232	2.33E+00	2.8E+01	1.7E-10	4.7E-09
U-234	8.65E+00	1.0E+02	1.6E-11	1.6E-09
U-235/236	6.02E-01	7.1E+00	1.6E-11	1.1E-10
U-238	8.87E+00	1.1E+02	2.8E-11	2.9E-09

Total Pathway: 3.4E-08

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/kg)	Intake	SF(i)	Risk
Arsenic	1.47E-07	2.8E-10	1.5E+01	4.2E-09
Beryllium	1.01E-08	1.9E-11	8.4E+00	1.6E-10
Dibenzo(a,h)anthracene	9.77E-09	1.8E-11	6.1E+00	1.1E-10
Lead	1.06E-07	2.0E-10		
TH-TOTAL	9.50E-08	1.8E-10		
2-Methylnaphthalene	7.10E-10	1.3E-12		

Total Pathway: 4.4E-09

Total Rad + Chem 1.6E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	3.32E+01	3.6E-07	1.8E+00	6.3E-07
Beryllium	2.27E+00	2.4E-08	4.3E+00	1.1E-07
Dibenzo(a,h)anthracene	2.20E+00	2.4E-08	7.3E+00	1.7E-07
Lead	2.39E+01	2.6E-07		
TH-TOTAL	2.14E+01	2.3E-07		
2-Methylnaphthalene	1.60E-01	1.7E-09		

Total Pathway: 9.1E-07

Total Rad + Chem 9.4E-07

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TABLE B.3.3-4
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	2.9E-02	4.3E-07	1.3E-08	1.3E-08
	PU-238	1.7E-02	2.8E-11	4.8E-13	2.4E-10
	PU-239/24	4.5E-03	2.7E-11	1.2E-13	6.5E-11
	RA-226	4.2E-01	6.0E-06	2.5E-06	2.6E-06
	RA-228	4.8E-01	2.9E-06	1.4E-06	1.4E-06
	SR-90	1.9E-01			3.7E-10
	TH-228	5.8E-01	5.6E-06	3.2E-06	3.2E-06
	TH-230	5.9E-01	5.4E-11	3.2E-11	1.2E-09
	TH-232	5.0E-01	8.5E-06	4.2E-06	4.2E-06
	U-234	1.8E+00	3.0E-11	5.5E-11	3.8E-09
	U-235/236	1.3E-01	2.4E-07	3.1E-08	3.1E-08
	U-238	1.9E+00	3.6E-08	6.8E-08	7.5E-08
Total Pathway:	Total Pathway: 1.2E-05				

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Arsenic	7.9E-08	1.8E+00	1.5E-07					7.8E-07
Beryllium	5.4E-08		1.1E-07					2.1E-07
Dibenzo(a,h)anthracene			1.7E-07	Not applicable				3.5E-07
Lead	5.7E-07							
TH-TOTAL								
2-Methylnaphthalene	1.1E-07							
Total Pathway:			4.2E-07	Total Pathway:				

Total Rad + Chem 4.2E-07 1.2E-05 *Total:* 1.3E-05

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TABLE B.3.3-4
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3	Intake	RfD(i)	Hazard
NP-237	6.08E-07	1.3E-03		
PU-238	3.60E-07	7.5E-04		
PU-239/240	9.32E-08	1.9E-04		
RA-226	8.79E-06	1.8E-02		
RA-228	9.95E-06	2.1E-02		
SR-90	3.86E-06	8.0E-03		
TH-228	1.20E-05	2.5E-02		
TH-230	1.23E-05	2.5E-02		
TH-232	1.03E-05	2.1E-02		
U-234	3.84E-05	8.0E-02		
U-235/236	2.67E-06	5.5E-03		
U-238	3.94E-05	8.2E-02		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.37E-01	1.6E+00		
PU-238	8.10E-02	9.6E-01		
PU-239/240	2.10E-02	2.5E-01		
RA-226	1.98E+00	2.3E+01		
RA-228	2.24E+00	2.7E+01		
SR-90	8.70E-01	1.0E+01		
TH-228	2.71E+00	3.2E+01		
TH-230	2.77E+00	3.3E+01		
TH-232	2.33E+00	2.8E+01		
U-234	8.65E+00	1.0E+02		
U-235/236	6.02E-01	7.1E+00		
U-238	8.87E+00	1.1E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(i)	Hazard
Arsenic	1.47E-07	1.6E-09		
Beryllium	1.01E-08	1.1E-10		
Dibenzo(a,h)anthracene	9.77E-09	1.1E-10		
Lead	1.06E-07	1.2E-09		
TH-TOTAL	9.50E-08	1.0E-09		
2-Methylnaphthalene	7.10E-10	7.8E-12		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.32E+01	2.1E-06	3.0E-04	7.0E-03
Beryllium	2.27E+00	1.4E-07	5.0E-03	2.9E-05
Dibenzo(a,h)anthracene	2.20E+00	1.4E-07		
Lead	2.39E+01	1.5E-06		
TH-TOTAL	2.14E+01	1.3E-06		
2-Methylnaphthalene	1.60E-01	1.0E-08		

Total Pathway: 7.0E-03

Total Rad + Chem 7.0E-03

TABLE B.3.3-4
(continued)

Non-carcinogenic Hazard

Radiation Hazard					
Dermal Contact/Soil		External Radiation/Soil			Total
		Compound	Intake	RfD(e)	Hazard
Not applicable		NP-237	2.9E-02		
		PU-238	1.7E-02		
		PU-239/240	4.5E-03		
		RA-226	4.2E-01		
		RA-228	4.8E-01		
		SR-90	1.9E-01		
		TH-228	5.8E-01		
		TH-230	5.9E-01		
		TH-232	5.0E-01		
		U-234	1.8E+00		
		U-235/236	1.3E-01		
		U-238	1.9E+00		
Total Pathway:		Total Pathway:			

Chemical Hazard								
Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Arsenic	4.6E-07	2.9E-04	1.6E-03					8.6E-03
Beryllium	3.2E-07	5.0E-05	6.3E-03					6.3E-03
Dibenzo(a,h)anthracene				Not applicable				
Lead	3.3E-06							
TH-TOTAL								
2-Methylnaphthalene	6.7E-07							
		Total Pathway:	7.9E-03			Total Pathway:		

Total Rad + Chem 7.9E-03

Total: 1.5E-02

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TABLE B.3.3-5
CURRENT, TRESPASSING YOUTH
INACTIVE FLYASH PILE: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.32E-01	4.9E-01	2.2E-10	1.1E-10
PU-238	8.09E-02	3.0E-01	2.2E-10	6.7E-11
PU-239/240	2.09E-02	7.8E-02	2.3E-10	1.8E-11
RA-226	1.98E+00	7.4E+00	7.8E-10	5.8E-09
RA-228	2.24E+00	8.4E+00	1.0E-10	8.4E-10
SR-90	8.69E-01	3.3E+00	3.6E-11	1.2E-10
U-234	7.71E+00	2.9E+01	1.6E-11	4.6E-10
U-235/236	5.40E-01	2.0E+00	1.6E-11	3.2E-11
U-238	7.93E+00	3.0E+01	2.8E-11	8.3E-10

Total Pathway: 8.3E-09

Dermal Contact/Sediment

Not applicable

Total Pathway:

External Radiation/Sediment

Compound	Intake	SF(e)	Risk
NP-237	9.4E-03	4.3E-07	4.0E-09
PU-238	5.8E-03	2.8E-11	1.6E-13
PU-239/24	1.5E-03	2.7E-11	4.0E-14
RA-226	1.4E-01	6.0E-06	8.5E-07
RA-228	1.6E-01	2.9E-06	4.6E-07
SR-90	6.2E-02		
U-234	5.5E-01	3.0E-11	1.6E-11
U-235/236	3.8E-02	2.4E-07	9.2E-09
U-238	5.6E-01	3.6E-08	2.0E-08

Total Pathway: 1.3E-06

Total
4.2E-09
6.7E-11
1.8E-11
8.5E-07
4.6E-07
1.2E-10
4.8E-10
9.3E-09
2.1E-08

Chemical Risk

Ingestion/Sediment

Compound	Conc'n (mg/kg	Intake	SF(o)	Risk
Arsenic	3.32E+01	1.1E-07	1.8E+00	2.0E-07
Beryllium	2.27E+00	7.7E-09	4.3E+00	3.3E-08
Lead	2.38E+01	8.1E-08		
2-Methylnaphthalene	1.59E-01	5.4E-10		
Dibenzo(a,h)anthracene	2.20E+00	7.5E-09	7.3E+00	5.5E-08
U-Total	2.34E+01	8.0E-08		

Total Pathway: 2.9E-07

Dermal Contact/Sediment

Compound	Intake	SF(derm)	Risk
Arsenic	9.7E-08	1.8E+00	4.0E-07
Beryllium	6.6E-08		3.3E-08
Lead	6.9E-07		
2-Methylnaphthalene			
Dibenzo(a,h)anthracene			5.5E-08
U-Total			

Total Pathway: 4.8E-07

External Radiation/Sediment

Compound	Intake	SF(e)	Risk

Not applicable

Total Pathway:

Total
5.9E-07
6.7E-08
1.1E-07

Total Rad + Chem 2.9E-07

Total Rad + Chem 4.8E-07

Total Rad + Chem 1.3E-06 *Total:* 2.1E-06

TABLE B.3.3-5
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment					Dermal Contact/Sediment	**Total**
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard		
NP-237	1.32E-01	4.9E-01			Not applicable	
PU-238	8.09E-02	3.0E-01				
PU-239/240	2.09E-02	7.8E-02				
RA-226	1.98E+00	7.4E+00				
RA-228	2.24E+00	8.4E+00				
SR-90	8.69E-01	3.3E+00				
U-234	7.71E+00	2.9E+01				
U-235/236	5.40E-01	2.0E+00				
U-238	7.93E+00	3.0E+01				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Sediment					Dermal Contact/Sediment				
Compound	Conc'n (mg/kg	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	3.32E+01	6.6E-07	3.0E-04	2.2E-03	Arsenic	5.6E-07	2.9E-04	2.0E-03	4.2E-03
Beryllium	2.27E+00	4.5E-08	5.0E-03	9.0E-06	Beryllium	3.9E-07	5.0E-05	7.7E-03	7.7E-03
Lead	2.38E+01	4.7E-07			Lead	4.0E-06			
2-Methylnaphthalene	1.59E-01	3.2E-09			2-Methylnaphthalene	8.1E-07			
Dibenzo(a,h)anthracene	2.20E+00	4.4E-08			Dibenzo(a,h)anthracene				
U-Total	2.34E+01	4.7E-07	3.0E-03	1.6E-04	U-Total	4.0E-06	1.5E-04	2.7E-02	2.7E-02
			Total Pathway:	2.4E-03			Total Pathway:	3.6E-02	
			Total Rad + Chem	2.4E-03			Total Rad + Chem	3.6E-02	*Total:* 3.9E-02

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TABLE B.3.3-5(b)
CURRENT, TRESPASSING YOUTH
INACTIVE FLYASH PILE: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	6.71E-01	1.5E+01	2.2E-10	3.2E-09		3.2E-09
PU-238	8.08E-01	1.8E+01	2.2E-10	3.9E-09	Not applicable	3.9E-09
PU-239/240	5.82E-02	1.3E+00	2.3E-10	2.9E-10		2.9E-10
RA-226	3.60E-01	7.9E+00	7.8E-10	6.1E-09		6.1E-09
RA-228	3.63E-01	7.9E+00	1.0E-10	7.9E-10		7.9E-10
SR-90	1.41E-01	3.1E+00	3.6E-11	1.1E-10		1.1E-10
U-234	1.63E+02	3.6E+03	1.6E-11	5.7E-08		5.7E-08
U-235/236	1.01E+01	2.2E+02	1.6E-11	3.5E-09		3.5E-09
U-238	1.60E+02	3.5E+03	2.8E-11	9.8E-08		9.8E-08
			Total Pathway:	1.7E-07	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	3.23E-03	6.4E-08	1.8E+00	1.1E-07	Arsenic	9.4E-09	1.8E+00	1.7E-08	1.3E-07
Beryllium	1.56E-04	3.1E-09	4.3E+00	1.3E-08	Beryllium	4.5E-10		1.3E-08	2.7E-08
Lead	1.30E-02	2.6E-07			Lead	1.5E-10			
Dibenzo(a,h)anthracene	2.22E-05	4.4E-10	7.3E+00	3.2E-09	Dibenzo(a,h)anthracene	1.7E-07		3.2E-09	6.4E-09
2-Methylnaphthalene	3.15E-03	6.3E-08			2-Methylnaphthalene	1.3E-06			
U-TOTAL	4.96E-01	9.9E-06			U-TOTAL				
			Total Pathway:	1.3E-07			Total Pathway:	3.4E-08	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	3.0E-07	Total Rad + Chem	3.4E-08	*Total:* 3.4E-07

TABLE B.3.3-5(b)
(continued)
INACTIVE FLYASH PILE: SURFACE WATER
Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	6.71E-01	1.5E+01				
PU-238	8.08E-01	1.8E+01				
PU-239/240	5.82E-02	1.3E+00				
RA-226	3.60E-01	7.9E+00				
RA-228	3.63E-01	7.9E+00				
SR-90	1.41E-01	3.1E+00				
U-234	1.63E+02	3.6E+03				
U-235/236	1.01E+01	2.2E+02				
U-238	1.60E+02	3.5E+03				
					Not applicable	
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	3.23E-03	3.7E-07	3.0E-04	1.2E-03	Arsenic	5.5E-08	2.9E-04	1.9E-04	1.4E-03
Beryllium	1.56E-04	1.8E-08	5.0E-03	3.6E-06	Beryllium	2.7E-09	5.0E-05	5.3E-05	5.7E-05
Lead	1.30E-02	1.5E-06			Lead	8.8E-10			
Dibenzo(a,h)anthracene	2.22E-05	2.6E-09			Dibenzo(a,h)anthracene	1.0E-06			
2-Methylnaphthalene	3.15E-03	3.7E-07			2-Methylnaphthalene	7.6E-06			
U-TOTAL	4.96E-01	5.8E-05	3.0E-03	1.9E-02	U-TOTAL	8.4E-06	1.5E-04	5.6E-02	7.5E-02
			Total Pathway:	2.0E-02			Total Pathway:	5.6E-02	
			Total Rad + Chem	2.0E-02			Total Rad + Chem	5.6E-02	*Total:* 7.7E-02

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TABLE B.3.3-6(a)
INACTIVE FLYASH PILE: SURFACE SOIL
CURRENT OFF-PROPERTY FARMER
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	4.82E-08	5.6E-03	2.9E-08	1.6E-10	1.6E-10
PU-238	2.92E-08	3.4E-03	3.9E-08	1.3E-10	1.3E-10
PU-239/240	7.56E-09	8.8E-04	3.8E-08	3.3E-11	3.3E-11
RA-226	7.11E-07	8.2E-02	7.0E-09	5.8E-10	5.8E-10
RA-228	8.07E-07	9.4E-02	6.9E-10	6.5E-11	6.5E-11
SR-90	3.13E-07	3.6E-02	6.2E-11	2.2E-12	2.2E-12
TH-228	9.76E-07	1.1E-01	7.8E-08	8.8E-09	8.8E-09
TH-230	9.97E-07	1.2E-01	2.9E-08	3.4E-09	3.4E-09
TH-232	8.39E-07	9.7E-02	1.1E-07	1.1E-08	1.1E-08
U-234	3.11E-06	3.6E-01	2.6E-08	9.4E-09	9.4E-09
U-235/236	2.12E-07	2.5E-02	2.5E-08	6.1E-10	6.1E-10
U-238	3.19E-06	3.7E-01	5.2E-08	1.9E-08	1.9E-08
			Total Pathway:	5.3E-08	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.20E-08	7.8E-10	1.5E+01	1.2E-08	1.2E-08
Beryllium	8.18E-10	5.3E-11	8.4E+00	4.5E-10	4.5E-10
Dibenzo(a,h)anthracene	7.74E-10	5.0E-11	6.1E+00	3.1E-10	3.1E-10
Lead	8.61E-09	5.6E-10			
TH-TOTAL	7.53E-09	4.9E-10			
2-Methylnaphthalene	5.63E-11	3.6E-12			
			Total Pathway:	1.2E-08	

Total Rad + Chem	6.5E-08	*Total:*	6.5E-08

TABLE B.3.3-6(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	4.82E-08	5.6E-03		
PU-238	2.92E-08	3.4E-03		
PU-239/240	7.56E-09	8.8E-04		
RA-226	7.11E-07	8.2E-02		
RA-228	8.07E-07	9.4E-02		
SR-90	3.13E-07	3.6E-02		
TH-228	9.76E-07	1.1E-01		
TH-230	9.97E-07	1.2E-01		
TH-232	8.39E-07	9.7E-02		
U-234	3.11E-06	3.6E-01		
U-235/236	2.12E-07	2.5E-02		
U-238	3.19E-06	3.7E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.20E-08	7.8E-10		
Beryllium	8.18E-10	5.3E-11		
Dibenzo(a,h)anthracene	7.74E-10	5.0E-11		
Lead	8.61E-09	5.6E-10		
TH-TOTAL	7.53E-09	4.9E-10		
2-Methylnaphthalene	5.63E-11	3.6E-12		

Total Pathway:

Total Rad + Chem

Total

Total:

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TABLE B.3.3-6(b)
INACTIVE FLYASH PILE: SURFACE SOIL
CURRENT OFF-PROPERTY RESIDENT CHILD
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	4.82E-08	1.0E-04	2.9E-08	2.9E-12	2.9E-12
PU-238	2.92E-08	6.1E-05	3.9E-08	2.4E-12	2.4E-12
PU-239/240	7.56E-09	1.6E-05	3.8E-08	6.0E-13	6.0E-13
RA-226	7.11E-07	1.5E-03	7.0E-09	1.0E-11	1.0E-11
RA-228	8.07E-07	1.7E-03	6.9E-10	1.2E-12	1.2E-12
SR-90	3.13E-07	6.6E-04	6.2E-11	4.1E-14	4.1E-14
TH-228	9.76E-07	2.0E-03	7.8E-08	1.6E-10	1.6E-10
TH-230	9.97E-07	2.1E-03	2.9E-08	6.1E-11	6.1E-11
TH-232	8.39E-07	1.8E-03	1.1E-07	1.9E-10	1.9E-10
U-234	3.11E-06	6.5E-03	2.6E-08	1.7E-10	1.7E-10
U-235/236	2.12E-07	4.5E-04	2.5E-08	1.1E-11	1.1E-11
U-238	3.19E-06	6.7E-03	5.2E-08	3.5E-10	3.5E-10
			Total Pathway:	9.6E-10	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.20E-08	6.6E-11	1.5E+01	9.9E-10	9.9E-10
Beryllium	8.18E-10	4.5E-12	8.4E+00	3.8E-11	3.8E-11
Dibenzo(a,h)anthracene	7.74E-10	4.2E-12	6.1E+00	2.6E-11	2.6E-11
Lead	8.61E-09	4.7E-11			
TH-TOTAL	7.53E-09	4.1E-11			
2-Methylnaphthalene	5.63E-11	3.1E-13			
			Total Pathway:	1.0E-09	

Total Rad + Chem	2.0E-09	*Total:*	2.0E-09

TABLE B.3.3-6(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	4.82E-08	1.0E-04		
PU-238	2.92E-08	6.1E-05		
PU-239/240	7.56E-09	1.6E-05		
RA-226	7.11E-07	1.5E-03		
RA-228	8.07E-07	1.7E-03		
SR-90	3.13E-07	6.6E-04		
TH-228	9.76E-07	2.0E-03		
TH-230	9.97E-07	2.1E-03		
TH-232	8.39E-07	1.8E-03		
U-234	3.11E-06	6.5E-03		
U-235/236	2.12E-07	4.5E-04		
U-238	3.19E-06	6.7E-03		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.20E-08	7.7E-10		
Beryllium	8.18E-10	5.2E-11		
Dibenzo(a,h)anthracene	7.74E-10	4.9E-11		
Lead	8.61E-09	5.5E-10		
TH-TOTAL	7.53E-09	4.8E-10		
2-Methylnaphthalene	5.63E-11	3.6E-12		

Total Pathway:

Total Rad + Chem

Total

Total:

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TABLE B.3.3-7(a)

CURRENT OFF-PROPERTY FARMER

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.30E-07	2.4E-04	2.2E-10	5.3E-14	NP-237	1.18E-08	8.7E-05	2.2E-10	1.9E-14	7.2E-14
PU-238	7.41E-10	1.4E-06	2.2E-10	3.0E-16	PU-238	1.48E-10	1.1E-06	2.2E-10	2.4E-16	5.4E-16
PU-239/240	2.06E-10	3.8E-07	2.3E-10	8.7E-17	PU-239/240	4.11E-11	3.0E-07	2.3E-10	7.0E-17	1.6E-16
RA-226	1.27E-05	2.3E-02	7.8E-10	1.8E-11	RA-226	2.28E-05	1.7E-01	7.8E-10	1.3E-10	1.5E-10
RA-228	9.19E-06	1.7E-02	1E-10	1.7E-12	RA-228	1.65E-05	1.2E-01	1.0E-10	1.2E-11	1.4E-11
SR-90	1.14E-04	2.1E-01	3.6E-11	7.5E-12	SR-90	5.71E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	2.42E-07	4.4E-04	5.5E-11	2.4E-14	TH-228	2.02E-07	1.5E-03	5.5E-11	8.2E-14	1.1E-13
TH-230	1.20E-06	2.2E-03	1.3E-11	2.9E-14	TH-230	1.00E-06	7.4E-03	1.3E-11	9.6E-14	1.2E-13
TH-232	1.02E-06	1.9E-03	1.7E-10	3.2E-13	TH-232	8.47E-07	6.2E-03	1.7E-10	1.1E-12	1.4E-12
U-234	2.69E-05	4.9E-02	1.6E-11	7.9E-13	U-234	8.06E-05	5.9E-01	1.6E-11	9.5E-12	1.0E-11
U-235/236	1.83E-06	3.4E-03	1.6E-11	5.4E-14	U-235/236	5.50E-06	4.0E-02	1.6E-11	6.5E-13	7.0E-13
U-238	2.76E-05	5.1E-02	2.8E-11	1.4E-12	U-238	8.27E-05	6.1E-01	2.8E-11	1.7E-11	1.8E-11
			Total Pathway:	3.0E-11				Total Pathway:	3.2E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.68E-06	3.8E-09	1.8E+00	6.6E-09	Arsenic	1.10E-07	4.5E-10	1.8E+00	7.9E-10	7.4E-09
Beryllium	8.02E-08	8.2E-11	4.3E+00	3.5E-10	Beryllium	7.22E-11	3.0E-13	4.3E+00	1.3E-12	3.6E-10
Dibenzo(a,h)anthracene	6.25E-06	6.4E-09	7.3E+00	4.7E-08	Dibenzo(a,h)anthracene	1.98E-06	8.1E-09	7.3E+00	5.9E-08	1.1E-07
Lead	1.71E-07	1.8E-10			Lead	1.42E-07	5.8E-10			
TH-TOTAL	9.12E-09	9.4E-12			TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	1.97E-09	2.0E-12			2-Methylnaphthalene	6.22E-10	2.6E-12			
			Total Pathway:	5.4E-08				Total Pathway:	6.0E-08	
			Total Rad + Chem	5.4E-08				Total Rad + Chem	6.0E-08	*Total:* 1.1E-07

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TABLE B.3.3-7(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	1.3E-07	2.4E-04			NP-237	1.18E-08	8.7E-05			
PU-238	7.4E-10	1.4E-06			PU-238	1.48E-10	1.1E-06			
PU-239/240	2.1E-10	3.8E-07			PU-239/240	4.11E-11	3.0E-07			
RA-226	1.3E-05	2.3E-02			RA-226	2.28E-05	1.7E-01			
RA-228	9.2E-06	1.7E-02			RA-228	1.65E-05	1.2E-01			
SR-90	1.1E-04	2.1E-01			SR-90	5.71E-04	4.2E+00			
TH-228	2.4E-07	4.4E-04			TH-228	2.02E-07	1.5E-03			
TH-230	1.2E-06	2.2E-03			TH-230	1.00E-06	7.4E-03			
TH-232	1.0E-06	1.9E-03			TH-232	8.47E-07	6.2E-03			
U-234	2.7E-05	4.9E-02			U-234	8.06E-05	5.9E-01			
U-235/236	1.8E-06	3.4E-03			U-235/236	5.50E-06	4.0E-02			
U-238	2.8E-05	5.1E-02			U-238	8.27E-05	6.1E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	3.7E-06	3.8E-09	3.0E-04	1.3E-05	Arsenic	1.10E-07	4.5E-10	3.0E-04	1.5E-06	1.4E-05
Beryllium	8.0E-08	8.2E-11	5.0E-03	1.6E-08	Beryllium	7.22E-11	3.0E-13	5.0E-03	5.9E-11	1.7E-08
Dibenzo(a,h)anthracene	6.3E-06	6.4E-09			Dibenzo(a,h)anthracene	1.98E-06	8.1E-09			
Lead	1.7E-07	1.8E-10			Lead	1.42E-07	5.8E-10			
TH-TOTAL	9.1E-09	9.4E-12			TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	2.0E-09	2.0E-12			2-Methylnaphthalene	6.22E-10	2.6E-12			
		Total Pathway:		1.3E-05			Total Pathway:		1.5E-06	
		Total Rad + Chem		1.3E-05			Total Rad + Chem		1.5E-06	*Total:* 1.4E-05

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TABLE B.3.3-7(b)

CURRENT OFF-PROPERTY CHILD

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.30E-07	7.9E-06	2.2E-10	1.7E-15	NP-237	1.18E-08	1.7E-05	2.2E-10	3.7E-15	5.5E-15
PU-238	7.41E-10	4.5E-08	2.2E-10	9.9E-18	PU-238	1.48E-10	2.1E-07	2.2E-10	4.7E-17	5.6E-17
PU-239/240	2.06E-10	1.3E-08	2.3E-10	2.9E-18	PU-239/240	4.11E-11	5.9E-08	2.3E-10	1.4E-17	1.6E-17
RA-226	1.27E-05	7.7E-04	7.8E-10	6.0E-13	RA-226	2.28E-05	3.3E-02	7.8E-10	2.5E-11	2.6E-11
RA-228	9.19E-06	5.6E-04	1E-10	5.6E-14	RA-228	1.65E-05	2.4E-02	1.0E-10	2.4E-12	2.4E-12
SR-90	1.14E-04	7.0E-03	3.6E-11	2.5E-13	SR-90	5.71E-04	8.1E-01	3.6E-11	2.9E-11	3.0E-11
TH-228	2.42E-07	1.5E-05	5.5E-11	8.1E-16	TH-228	2.02E-07	2.9E-04	5.5E-11	1.6E-14	1.7E-14
TH-230	1.20E-06	7.3E-05	1.3E-11	9.5E-16	TH-230	1.00E-06	1.4E-03	1.3E-11	1.9E-14	2.0E-14
TH-232	1.02E-06	6.2E-05	1.7E-10	1.1E-14	TH-232	8.47E-07	1.2E-03	1.7E-10	2.1E-13	2.2E-13
U-234	2.69E-05	1.6E-03	1.6E-11	2.6E-14	U-234	8.06E-05	1.2E-01	1.6E-11	1.8E-12	1.9E-12
U-235/236	1.83E-06	1.1E-04	1.6E-11	1.8E-15	U-235/236	5.50E-06	7.8E-03	1.6E-11	1.3E-13	1.3E-13
U-238	2.76E-05	1.7E-03	2.8E-11	4.7E-14	U-238	8.27E-05	1.2E-01	2.8E-11	3.3E-12	3.4E-12
			Total Pathway:	1.0E-12				Total Pathway:	6.3E-11	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.68E-06	5.8E-10	1.8E+00	1.0E-09	Arsenic	1.10E-07	4.1E-10	1.8E+00	7.2E-10	1.7E-09
Beryllium	8.02E-08	1.3E-11	4.3E+00	5.5E-11	Beryllium	7.22E-11	2.7E-13	4.3E+00	1.2E-12	5.6E-11
Dibenzo(a,h)anthracene	6.25E-06	9.9E-10	7.3E+00	7.3E-09	Dibenzo(a,h)anthracene	1.98E-06	7.4E-09	7.3E+00	5.4E-08	6.1E-08
Lead	1.71E-07	2.7E-11			Lead	1.42E-07	5.3E-10			
TH-TOTAL	9.12E-09	1.4E-12			TH-TOTAL	7.60E-09	2.8E-11			
2-Methylnaphthalene	1.97E-09	3.1E-13			2-Methylnaphthalene	6.22E-10	2.3E-12			
			Total Pathway:	8.3E-09				Total Pathway:	5.5E-08	
			Total Rad + Chem	8.3E-09				Total Rad + Chem	5.5E-08	*Total:* 6.3E-08

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TABLE B.3.3-7(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.3E-07	7.9E-06		
PU-238	7.4E-10	4.5E-08		
PU-239/240	2.1E-10	1.3E-08		
RA-226	1.3E-05	7.7E-04		
RA-228	9.2E-06	5.6E-04		
SR-90	1.1E-04	7.0E-03		
TH-228	2.4E-07	1.5E-05		
TH-230	1.2E-06	7.3E-05		
TH-232	1.0E-06	6.2E-05		
U-234	2.7E-05	1.6E-03		
U-235/236	1.8E-06	1.1E-04		
U-238	2.8E-05	1.7E-03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	1.18E-08	1.7E-05		
PU-238	1.48E-10	2.1E-07		
PU-239/240	4.11E-11	5.9E-08		
RA-226	2.28E-05	3.3E-02		
RA-228	1.65E-05	2.4E-02		
SR-90	5.71E-04	8.1E-01		
TH-228	2.02E-07	2.9E-04		
TH-230	1.00E-06	1.4E-03		
TH-232	8.47E-07	1.2E-03		
U-234	8.06E-05	1.2E-01		
U-235/236	5.50E-06	7.8E-03		
U-238	8.27E-05	1.2E-01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.7E-06	6.8E-09	3.0E-04	2.3E-05
Beryllium	8.0E-08	1.5E-10	5.0E-03	3.0E-08
Dibenzo(a,h)anthracene	6.3E-06	1.2E-08		
Lead	1.7E-07	3.2E-10		
TH-TOTAL	9.1E-09	1.7E-11		
2-Methylnaphthalene	2.0E-09	3.6E-12		

Total Pathway: 2.3E-05

Total Rad + Chem 2.3E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic	1.10E-07	4.8E-09	3.0E-04	1.6E-05
Beryllium	7.22E-11	3.1E-12	5.0E-03	6.3E-10
Dibenzo(a,h)anthracene	1.98E-06	8.6E-08		
Lead	1.42E-07	6.2E-09		
TH-TOTAL	7.60E-09	3.3E-10		
2-Methylnaphthalene	6.22E-10	2.7E-11		

Total Pathway: 1.6E-05

Total Rad + Chem 1.6E-05

Total

3.9E-05

3.0E-08

Total: 3.9E-05

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TABLE B.3.3-8(a)

CURRENT OFF-PROPERTY FARMER

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	2.38E-08	4.7E-02	2.2E-10	1.0E-11
PU-238	1.43E-08	2.8E-02	2.2E-10	6.2E-12
PU-239/240	3.70E-09	7.3E-03	2.3E-10	1.7E-12
RA-226	3.58E-07	7.1E-01	7.8E-10	5.5E-10
RA-228	3.96E-07	7.8E-01	1.0E-10	7.8E-11
SR-90	4.67E-07	9.2E-01	3.6E-11	3.3E-11
TH-228	4.77E-07	9.4E-01	5.5E-11	5.2E-11
TH-230	4.98E-07	9.8E-01	1.3E-11	1.3E-11
TH-232	4.19E-07	8.3E-01	1.7E-10	1.4E-10
U-234	1.52E-06	3.0E+00	1.6E-11	4.8E-11
U-235/236	1.04E-07	2.0E-01	1.6E-11	3.3E-12
U-238	1.56E-06	3.1E+00	2.8E-11	8.6E-11

Total Pathway: 1.0E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	2.38E-08	2.5E-02	2.2E-10	5.5E-12
PU-238	1.43E-08	1.5E-02	2.2E-10	3.3E-12
PU-239/240	3.70E-09	3.9E-03	2.3E-10	8.9E-13
RA-226	3.58E-07	3.7E-01	7.8E-10	2.9E-10
RA-228	3.92E-07	4.1E-01	1.0E-10	4.1E-11
SR-90	4.66E-07	4.9E-01	3.6E-11	1.8E-11
TH-228	4.64E-07	4.8E-01	5.5E-11	2.7E-11
TH-230	4.98E-07	5.2E-01	1.3E-11	6.8E-12
TH-232	4.19E-07	4.4E-01	1.7E-10	7.4E-11
U-234	1.52E-06	1.6E+00	1.6E-11	2.5E-11
U-235/236	1.04E-07	1.1E-01	1.6E-11	1.7E-12
U-238	1.56E-06	1.6E+00	2.8E-11	4.6E-11

Total Pathway: 5.4E-10

Total
1.6E-11
9.5E-12
2.6E-12
8.4E-10
1.2E-10
5.1E-11
7.8E-11
2.0E-11
2.1E-10
7.3E-11
5.0E-12
1.3E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	7.23E-06	8.0E-09	1.8E+00	1.4E-08
Beryllium	4.29E-07	4.7E-10	4.3E+00	2.0E-09
Dibenzo(a,h)anthracene	3.87E-07	4.3E-10	7.3E+00	3.1E-09
Lead	4.49E-06	4.9E-09		
TH-TOTAL	3.76E-06	4.1E-09		
2-Methylnaphthalene	9.65E-08	1.1E-10		

Total Pathway: 1.9E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	7.23E-06	4.2E-09	1.8E+00	7.4E-09
Beryllium	4.29E-07	2.5E-10	4.3E+00	1.1E-09
Dibenzo(a,h)anthracene	3.85E-07	2.2E-10	7.3E+00	1.6E-09
Lead	4.49E-06	2.6E-09		
TH-TOTAL	3.76E-06	2.2E-09		
2-Methylnaphthalene	9.65E-08	5.6E-11		

Total Pathway: 1.0E-08

2.1E-08			
3.1E-09			
4.7E-09			

Total Rad + Chem 2.0E-08

Total Rad + Chem 1.1E-08 *Total:* 3.1E-08

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TABLE B.3.3-8(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.4E-08	4.7E-02		
PU-238	1.4E-08	2.8E-02		
PU-239/240	3.7E-09	7.3E-03		
RA-226	3.6E-07	7.1E-01		
RA-228	4.0E-07	7.8E-01		
SR-90	4.7E-07	9.2E-01		
TH-228	4.8E-07	9.4E-01		
TH-230	5.0E-07	9.8E-01		
TH-232	4.2E-07	8.3E-01		
U-234	1.5E-06	3.0E+00		
U-235/236	1.0E-07	2.0E-01		
U-238	1.6E-06	3.1E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.38E-08	2.5E-02		
PU-238	1.43E-08	1.5E-02		
PU-239/240	3.70E-09	3.9E-03		
RA-226	3.58E-07	3.7E-01		
RA-228	3.92E-07	4.1E-01		
SR-90	4.66E-07	4.9E-01		
TH-228	4.64E-07	4.8E-01		
TH-230	4.98E-07	5.2E-01		
TH-232	4.19E-07	4.4E-01		
U-234	1.52E-06	1.6E+00		
U-235/236	1.04E-07	1.1E-01		
U-238	1.56E-06	1.6E+00		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.2E-06	8.0E-09	3.0E-04	2.7E-05
Beryllium	4.3E-07	4.7E-10	5.0E-03	9.5E-08
Dibenzo(a,h)anthracene	3.9E-07	4.3E-10		
Lead	4.5E-06	4.9E-09		
TH-TOTAL	3.8E-06	4.1E-09		
2-Methylnaphthalene	9.6E-08	1.1E-10		

Total Pathway: 2.7E-05

Total Rad + Chem 2.7E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.23E-06	4.2E-09	3.0E-04	1.4E-05
Beryllium	4.29E-07	2.5E-10	5.0E-03	5.0E-08
Dibenzo(a,h)anthracene	3.85E-07	2.2E-10		
Lead	4.49E-06	2.6E-09		
TH-TOTAL	3.76E-06	2.2E-09		
2-Methylnaphthalene	9.65E-08	5.6E-11		

Total Pathway: 1.4E-05

Total Rad + Chem 1.4E-05

Total	
	4.1E-05
	1.4E-07

Total: 4.1E-05

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TABLE B.3.3-8(b)

CURRENT OFF-PROPERTY CHILD

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	2.38E-08	2.0E-03	2.2E-10	4.4E-13	NP-237	2.38E-08	3.1E-03	2.2E-10	6.7E-13	1.1E-12
PU-238	1.43E-08	1.2E-03	2.2E-10	2.6E-13	PU-238	1.43E-08	1.8E-03	2.2E-10	4.0E-13	6.7E-13
PU-239/240	3.70E-09	3.1E-04	2.3E-10	7.2E-14	PU-239/240	3.70E-09	4.8E-04	2.3E-10	1.1E-13	1.8E-13
RA-226	3.58E-07	3.0E-02	7.8E-10	2.3E-11	RA-226	3.58E-07	4.6E-02	7.8E-10	3.6E-11	5.9E-11
RA-228	3.96E-07	3.3E-02	1.0E-10	3.3E-12	RA-228	3.92E-07	5.0E-02	1.0E-10	5.0E-12	8.4E-12
SR-90	4.67E-07	3.9E-02	3.6E-11	1.4E-12	SR-90	4.66E-07	6.0E-02	3.6E-11	2.2E-12	3.6E-12
TH-228	4.77E-07	4.0E-02	5.5E-11	2.2E-12	TH-228	4.64E-07	6.0E-02	5.5E-11	3.3E-12	5.5E-12
TH-230	4.98E-07	4.2E-02	1.3E-11	5.4E-13	TH-230	4.98E-07	6.4E-02	1.3E-11	8.3E-13	1.4E-12
TH-232	4.19E-07	3.5E-02	1.7E-10	6.0E-12	TH-232	4.19E-07	5.4E-02	1.7E-10	9.2E-12	1.5E-11
U-234	1.52E-06	1.3E-01	1.6E-11	2.0E-12	U-234	1.52E-06	2.0E-01	1.6E-11	3.1E-12	5.2E-12
U-235/236	1.04E-07	8.7E-03	1.6E-11	1.4E-13	U-235/236	1.04E-07	1.3E-02	1.6E-11	2.1E-13	3.5E-13
U-238	1.56E-06	1.3E-01	2.8E-11	3.7E-12	U-238	1.56E-06	2.0E-01	2.8E-11	5.6E-12	9.3E-12
			Total Pathway:	4.4E-11				Total Pathway:	6.7E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	7.23E-06	1.6E-09	1.8E+00	2.8E-09	Arsenic	7.23E-06	2.4E-09	1.8E+00	4.2E-09	7.0E-09
Beryllium	4.29E-07	9.4E-11	4.3E+00	4.0E-10	Beryllium	4.29E-07	1.4E-10	4.3E+00	6.2E-10	1.0E-09
Dibenzo(a,h)anthracene	3.87E-07	8.5E-11	7.3E+00	6.2E-10	Dibenzo(a,h)anthracene	3.85E-07	1.3E-10	7.3E+00	9.4E-10	1.6E-09
Lead	4.49E-06	9.8E-10			Lead	4.49E-06	1.5E-09			
TH-TOTAL	3.76E-06	8.3E-10			TH-TOTAL	3.76E-06	1.3E-09			
2-Methylnaphthalene	9.65E-08	2.1E-11			2-Methylnaphthalene	9.65E-08	3.2E-11			
			Total Pathway:	3.8E-09				Total Pathway:	5.8E-09	
			Total Rad + Chem	3.8E-09				Total Rad + Chem	5.9E-09	*Total:* 9.7E-09

TABLE B.3.3-8(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.4E-08	2.0E-03		
PU-238	1.4E-08	1.2E-03		
PU-239/240	3.7E-09	3.1E-04		
RA-226	3.6E-07	3.0E-02		
RA-228	4.0E-07	3.3E-02		
SR-90	4.7E-07	3.9E-02		
TH-228	4.8E-07	4.0E-02		
TH-230	5.0E-07	4.2E-02		
TH-232	4.2E-07	3.5E-02		
U-234	1.5E-06	1.3E-01		
U-235/236	1.0E-07	8.7E-03		
U-238	1.6E-06	1.3E-01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.38E-08	3.1E-03		
PU-238	1.43E-08	1.8E-03		
PU-239/240	3.70E-09	4.8E-04		
RA-226	3.58E-07	4.6E-02		
RA-228	3.92E-07	5.0E-02		
SR-90	4.66E-07	6.0E-02		
TH-228	4.64E-07	6.0E-02		
TH-230	4.98E-07	6.4E-02		
TH-232	4.19E-07	5.4E-02		
U-234	1.52E-06	2.0E-01		
U-235/236	1.04E-07	1.3E-02		
U-238	1.56E-06	2.0E-01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.2E-06	1.8E-08	3.0E-04	6.2E-05
Beryllium	4.3E-07	1.1E-09	5.0E-03	2.2E-07
Dibenzo(a,h)anthracene	3.9E-07	9.9E-10		
Lead	4.5E-06	1.1E-08		
TH-TOTAL	3.8E-06	9.6E-09		
2-Methylnaphthalene	9.6E-08	2.5E-10		

Total Pathway: 6.2E-05

Total Rad + Chem 6.2E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.23E-06	2.8E-08	3.0E-04	9.4E-05
Beryllium	4.29E-07	1.7E-09	5.0E-03	3.4E-07
Dibenzo(a,h)anthracene	3.85E-07	1.5E-09		
Lead	4.49E-06	1.8E-08		
TH-TOTAL	3.76E-06	1.5E-08		
2-Methylnaphthalene	9.65E-08	3.8E-10		

Total Pathway: 9.5E-05

Total Rad + Chem 9.5E-05

Total	
	1.6E-04
	5.6E-07
Total:	1.6E-04

TABLE B.3.3-9

CURRENT USER OF MILK AND MEAT

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.30E-07	2.4E-04	2.2E-10	5.3E-14	NP-237	1.18E-08	8.7E-05	2.2E-10	1.9E-14	7.2E-14
PU-238	7.41E-10	1.4E-06	2.2E-10	3.0E-16	PU-238	1.48E-10	1.1E-06	2.2E-10	2.4E-16	5.4E-16
PU-239/240	2.06E-10	3.8E-07	2.3E-10	8.7E-17	PU-239/240	4.11E-11	3.0E-07	2.3E-10	7.0E-17	1.6E-16
RA-226	1.27E-05	2.3E-02	7.8E-10	1.8E-11	RA-226	2.28E-05	1.7E-01	7.8E-10	1.3E-10	1.5E-10
RA-228	9.19E-06	1.7E-02	1.0E-10	1.7E-12	RA-228	1.65E-05	1.2E-01	1.0E-10	1.2E-11	1.4E-11
SR-90	1.14E-04	2.1E-01	3.6E-11	7.5E-12	SR-90	5.71E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	2.42E-07	4.4E-04	5.5E-11	2.4E-14	TH-228	2.02E-07	1.5E-03	5.5E-11	8.2E-14	1.1E-13
TH-230	1.20E-06	2.2E-03	1.3E-11	2.9E-14	TH-230	1.00E-06	7.4E-03	1.3E-11	9.6E-14	1.2E-13
TH-232	1.02E-06	1.9E-03	1.7E-10	3.2E-13	TH-232	8.47E-07	6.2E-03	1.7E-10	1.1E-12	1.4E-12
U-234	2.69E-05	4.9E-02	1.6E-11	7.9E-13	U-234	8.06E-05	5.9E-01	1.6E-11	9.5E-12	1.0E-11
U-235/236	1.83E-06	3.4E-03	1.6E-11	5.4E-14	U-235/236	5.50E-06	4.0E-02	1.6E-11	6.5E-13	7.0E-13
U-238	2.76E-05	5.1E-02	2.8E-11	1.4E-12	U-238	8.27E-05	6.1E-01	2.8E-11	1.7E-11	1.8E-11
			Total Pathway:	3.0E-11				Total Pathway:	3.2E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.68E-06	3.8E-09	1.8E+00	6.6E-09	Arsenic	1.10E-07	4.5E-10	1.8E+00	7.9E-10	7.4E-09
Beryllium	8.02E-08	8.2E-11	4.3E+00	3.5E-10	Beryllium	7.22E-11	3.0E-13	4.3E+00	1.3E-12	3.6E-10
Dibenzo(a,h)anthracene	6.25E-06	6.4E-09	7.3E+00	4.7E-08	Dibenzo(a,h)anthracene	1.98E-06	8.1E-09	7.3E+00	5.9E-08	1.1E-07
Lead	1.71E-07	1.8E-10			Lead	1.42E-07	5.8E-10			
TH-TOTAL	9.12E-09	9.4E-12			TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	1.97E-09	2.0E-12			2-Methylnaphthalene	6.22E-10	2.6E-12			
			Total Pathway:	5.4E-08				Total Pathway:	6.0E-08	
			Total Rad + Chem	5.4E-08				Total Rad + Chem	6.0E-08	*Total:* 1.1E-07

TABLE B.3.3-9
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	1.3E-07	2.4E-04			NP-237	1.18E-08	8.7E-05			
PU-238	7.4E-10	1.4E-06			PU-238	1.48E-10	1.1E-06			
PU-239/240	2.1E-10	3.8E-07			PU-239/240	4.11E-11	3.0E-07			
RA-226	1.3E-05	2.3E-02			RA-226	2.28E-05	1.7E-01			
RA-228	9.2E-06	1.7E-02			RA-228	1.65E-05	1.2E-01			
SR-90	1.1E-04	2.1E-01			SR-90	5.71E-04	4.2E+00			
TH-228	2.4E-07	4.4E-04			TH-228	2.02E-07	1.5E-03			
TH-230	1.2E-06	2.2E-03			TH-230	1.00E-06	7.4E-03			
TH-232	1.0E-06	1.9E-03			TH-232	8.47E-07	6.2E-03			
U-234	2.7E-05	4.9E-02			U-234	8.06E-05	5.9E-01			
U-235/236	1.8E-06	3.4E-03			U-235/236	5.50E-06	4.0E-02			
U-238	2.8E-05	5.1E-02			U-238	8.27E-05	6.1E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	3.7E-06	3.8E-09	3.0E-04	1.3E-05	Arsenic	1.10E-07	4.5E-10	3.0E-04	1.5E-06	1.4E-05
Beryllium	8.0E-08	8.2E-11	5.0E-03	1.6E-08	Beryllium	7.22E-11	3.0E-13	5.0E-03	5.9E-11	1.7E-08
Dibenzo(a,h)anthracene	6.3E-06	6.4E-09			Dibenzo(a,h)anthracene	1.98E-06	8.1E-09			
Lead	1.7E-07	1.8E-10			Lead	1.42E-07	5.8E-10			
TH-TOTAL	9.1E-09	9.4E-12			TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	2.0E-09	2.0E-12			2-Methylnaphthalene	6.22E-10	2.6E-12			
		Total Pathway:		1.3E-05			Total Pathway:		1.5E-06	
		Total Rad + Chem		1.3E-05			Total Rad + Chem		1.5E-06	*Total:* 1.4E-05

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TABLE B.3.3-10
CURRENT, GROUNDSKEEPER
INACTIVE FLYASH PILE: SURFACE SOIL

Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	6.08E-07	1.1E-02	2.9E-08	3.1E-10
PU-238	3.60E-07	6.3E-03	3.9E-08	2.5E-10
PU-239/240	9.32E-08	1.6E-03	3.8E-08	6.2E-11
RA-226	8.79E-06	1.5E-01	7.0E-09	1.1E-09
RA-228	9.95E-06	1.7E-01	6.9E-10	1.2E-10
SR-90	3.86E-06	6.8E-02	6.2E-11	4.2E-12
TH-228	1.20E-05	2.1E-01	7.8E-08	1.6E-08
TH-230	1.23E-05	2.2E-01	2.9E-08	6.2E-09
TH-232	1.03E-05	1.8E-01	1.1E-07	2.0E-08
U-234	3.84E-05	6.7E-01	2.6E-08	1.7E-08
U-235/236	2.67E-06	4.7E-02	2.5E-08	1.2E-09
U-238	3.94E-05	6.9E-01	5.2E-08	3.6E-08

Total Pathway: 9.9E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.37E-01	1.2E+01	2.2E-10	2.6E-09
PU-238	8.10E-02	7.1E+00	2.2E-10	1.6E-09
PU-239/240	2.10E-02	1.8E+00	2.3E-10	4.2E-10
RA-226	1.98E+00	1.7E+02	7.8E-10	1.4E-07
RA-228	2.24E+00	2.0E+02	1.0E-10	2.0E-08
SR-90	8.70E-01	7.6E+01	3.6E-11	2.7E-09
TH-228	2.71E+00	2.4E+02	5.5E-11	1.3E-08
TH-230	2.77E+00	2.4E+02	1.3E-11	3.2E-09
TH-232	2.33E+00	2.0E+02	1.7E-10	3.5E-08
U-234	8.65E+00	7.6E+02	1.6E-11	1.2E-08
U-235/236	6.02E-01	5.3E+01	1.6E-11	8.4E-10
U-238	8.87E+00	7.8E+02	2.8E-11	2.2E-08

Total Pathway: 2.5E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/kg)	Intake	SF(i)	Risk
Arsenic	1.47E-07	1.4E-09	1.5E+01	2.2E-08
Beryllium	1.01E-08	9.9E-11	8.4E+00	8.3E-10
Dibenzo(a,h)anthracene	9.77E-09	9.6E-11	6.1E+00	5.8E-10
Lead	1.06E-07	1.0E-09		
TH-TOTAL	9.50E-08	9.3E-10		
2-Methylnaphthalene	7.10E-10	6.9E-12		

Total Pathway: 2.3E-08

Total Rad + Chem 1.2E-07

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	3.32E+01	1.6E-06	1.8E+00	2.8E-06
Beryllium	2.27E+00	1.1E-07	4.3E+00	4.8E-07
Dibenzo(a,h)anthracene	2.20E+00	1.1E-07	7.3E+00	7.9E-07
Lead	2.39E+01	1.2E-06		
TH-TOTAL	2.14E+01	1.0E-06		
2-Methylnaphthalene	1.60E-01	7.8E-09		

Total Pathway: 4.1E-06

Total Rad + Chem 4.4E-06

TABLE B.3.3-10
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			**Total**
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	1.1E-01	4.3E-07	4.7E-08	5.0E-08
	PU-238	6.5E-02	2.8E-11	1.8E-12	1.8E-09
	PU-239/24	1.7E-02	2.7E-11	4.5E-13	4.9E-10
	RA-226	1.6E+00	6.0E-06	9.5E-06	9.6E-06
	RA-228	1.8E+00	2.9E-06	5.2E-06	5.2E-06
	SR-90	7.0E-01			2.7E-09
	TH-228	2.2E+00	5.6E-06	1.2E-05	1.2E-05
	TH-230	2.2E+00	5.4E-11	1.2E-10	9.5E-09
	TH-232	1.9E+00	8.5E-06	1.6E-05	1.6E-05
	U-234	6.9E+00	3.0E-11	2.1E-10	3.0E-08
	U-235/236	4.8E-01	2.4E-07	1.2E-07	1.2E-07
	U-238	7.1E+00	3.6E-08	2.6E-07	3.1E-07
Total Pathway:	Total Pathway: 4.3E-05			

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Arsenic	9.3E-08	1.8E+00	1.7E-07					3.0E-06
Beryllium	6.4E-08		4.8E-07					9.6E-07
Dibenzo(a,h)anthracene			7.9E-07	Not applicable				1.6E-06
Lead	6.7E-07							
TH-TOTAL								
2-Methylnaphthalene	1.4E-07							
	Total Pathway:		1.4E-06	Total Pathway:				
	Total Rad + Chem		1.4E-06	Total Rad + Chem			4.3E-05	*Total:* 4.9E-05

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TABLE B.3.3-10
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3	Intake	RfD(i)	Hazard
NP-237	6.08E-07	1.1E-02		
PU-238	3.60E-07	6.3E-03		
PU-239/240	9.32E-08	1.6E-03		
RA-226	8.79E-06	1.5E-01		
RA-228	9.95E-06	1.7E-01		
SR-90	3.86E-06	6.8E-02		
TH-228	1.20E-05	2.1E-01		
TH-230	1.23E-05	2.2E-01		
TH-232	1.03E-05	1.8E-01		
U-234	3.84E-05	6.7E-01		
U-235/236	2.67E-06	4.7E-02		
U-238	3.94E-05	6.9E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.37E-01	1.2E+01		
PU-238	8.10E-02	7.1E+00		
PU-239/240	2.10E-02	1.8E+00		
RA-226	1.98E+00	1.7E+02		
RA-228	2.24E+00	2.0E+02		
SR-90	8.70E-01	7.6E+01		
TH-228	2.71E+00	2.4E+02		
TH-230	2.77E+00	2.4E+02		
TH-232	2.33E+00	2.0E+02		
U-234	8.65E+00	7.6E+02		
U-235/236	6.02E-01	5.3E+01		
U-238	8.87E+00	7.8E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(i)	Hazard
Arsenic	1.47E-07	4.0E-09		
Beryllium	1.01E-08	2.8E-10		
Dibenzo(a,h)anthracene	9.77E-09	2.7E-10		
Lead	1.06E-07	2.9E-09		
TH-TOTAL	9.50E-08	2.6E-09		
2-Methylnaphthalene	7.10E-10	1.9E-11		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.32E+01	4.5E-06	3.0E-04	1.5E-02
Beryllium	2.27E+00	3.1E-07	5.0E-03	6.2E-05
Dibenzo(a,h)anthracene	2.20E+00	3.0E-07		
Lead	2.39E+01	3.3E-06		
TH-TOTAL	2.14E+01	2.9E-06		
2-Methylnaphthalene	1.60E-01	2.2E-08		

Total Pathway: 1.5E-02

Total Rad + Chem

Total Rad + Chem 1.5E-02

TABLE B.3.3-10
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	1.1E-01		
	PU-238	6.5E-02		
	PU-239/240	1.7E-02		
	RA-226	1.6E+00		
	RA-228	1.8E+00		
	SR-90	7.0E-01		
	TH-228	2.2E+00		
	TH-230	2.2E+00		
	TH-232	1.9E+00		
	U-234	6.9E+00		
	U-235/236	4.8E-01		
	U-238	7.1E+00		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Arsenic	2.6E-07	2.9E-04	9.2E-04					1.6E-02
Beryllium	1.8E-07	5.0E-05	3.6E-03					3.6E-03
Dibenzo(a,h)anthracene				Not applicable				
Lead	1.9E-06							
TH-TOTAL								
2-Methylnaphthalene	3.8E-07							
Total Pathway:			4.5E-03	Total Pathway:				
Total Rad + Chem			4.5E-03	Total Rad + Chem				*Total:* 2.0E-02

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TABLE B.3.3-11(a)
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE OFF-PROPERTY FARMER (Federal Ownership)
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	4.82E-08	5.6E-03	2.9E-08	1.6E-10	1.6E-10
PU-238	2.92E-08	3.4E-03	3.9E-08	1.3E-10	1.3E-10
PU-239/240	7.56E-09	8.8E-04	3.8E-08	3.3E-11	3.3E-11
RA-226	7.11E-07	8.2E-02	7.0E-09	5.8E-10	5.8E-10
RA-228	8.07E-07	9.4E-02	6.9E-10	6.5E-11	6.5E-11
SR-90	3.13E-07	3.6E-02	6.2E-11	2.2E-12	2.2E-12
TH-228	9.76E-07	1.1E-01	7.8E-08	8.8E-09	8.8E-09
TH-230	9.97E-07	1.2E-01	2.9E-08	3.4E-09	3.4E-09
TH-232	8.39E-07	9.7E-02	1.1E-07	1.1E-08	1.1E-08
U-234	3.11E-06	3.6E-01	2.6E-08	9.4E-09	9.4E-09
U-235/236	2.12E-07	2.5E-02	2.5E-08	6.1E-10	6.1E-10
U-238	3.19E-06	3.7E-01	5.2E-08	1.9E-08	1.9E-08
			Total Pathway:	5.3E-08	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.20E-08	7.8E-10	1.5E+01	1.2E-08	1.2E-08
Beryllium	8.18E-10	5.3E-11	8.4E+00	4.5E-10	4.5E-10
Dibenzo(a,h)anthracene	7.74E-10	5.0E-11	6.1E+00	3.1E-10	3.1E-10
Lead	8.61E-09	5.6E-10			
TH-TOTAL	7.53E-09	4.9E-10			
2-Methylnaphthalene	5.63E-11	3.6E-12			
			Total Pathway:	1.2E-08	

Total Rad + Chem 6.5E-08 *Total:* 6.5E-08

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TABLE B.3.3-11(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	4.82E-08	5.6E-03		
PU-238	2.92E-08	3.4E-03		
PU-239/240	7.56E-09	8.8E-04		
RA-226	7.11E-07	8.2E-02		
RA-228	8.07E-07	9.4E-02		
SR-90	3.13E-07	3.6E-02		
TH-228	9.76E-07	1.1E-01		
TH-230	9.97E-07	1.2E-01		
TH-232	8.39E-07	9.7E-02		
U-234	3.11E-06	3.6E-01		
U-235/236	2.12E-07	2.5E-02		
U-238	3.19E-06	3.7E-01		

Total Pathway:

Total

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.20E-08	7.8E-10		
Beryllium	8.18E-10	5.3E-11		
Dibenzo(a,h)anthracene	7.74E-10	5.0E-11		
Lead	8.61E-09	5.6E-10		
TH-TOTAL	7.53E-09	4.9E-10		
2-Methylnaphthalene	5.63E-11	3.6E-12		

Total Pathway:

Total Rad + Chem

Total:

TABLE B.3.3-11(b)
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE OFF-PROPERTY RESIDENT CHILD (Federal Ownership)
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	4.82E-08	1.0E-04	2.9E-08	2.9E-12	2.9E-12
PU-238	2.92E-08	6.1E-05	3.9E-08	2.4E-12	2.4E-12
PU-239/240	7.56E-09	1.6E-05	3.8E-08	6.0E-13	6.0E-13
RA-226	7.11E-07	1.5E-03	7.0E-09	1.0E-11	1.0E-11
RA-228	8.07E-07	1.7E-03	6.9E-10	1.2E-12	1.2E-12
SR-90	3.13E-07	6.6E-04	6.2E-11	4.1E-14	4.1E-14
TH-228	9.76E-07	2.0E-03	7.8E-08	1.6E-10	1.6E-10
TH-230	9.97E-07	2.1E-03	2.9E-08	6.1E-11	6.1E-11
TH-232	8.39E-07	1.8E-03	1.1E-07	1.9E-10	1.9E-10
U-234	3.11E-06	6.5E-03	2.6E-08	1.7E-10	1.7E-10
U-235/236	2.12E-07	4.5E-04	2.5E-08	1.1E-11	1.1E-11
U-238	3.19E-06	6.7E-03	5.2E-08	3.5E-10	3.5E-10
			Total Pathway:	9.6E-10	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.20E-08	6.6E-11	1.5E+01	9.9E-10	9.9E-10
Beryllium	8.18E-10	4.5E-12	8.4E+00	3.8E-11	3.8E-11
Dibenzo(a,h)anthracene	7.74E-10	4.2E-12	6.1E+00	2.6E-11	2.6E-11
Lead	8.61E-09	4.7E-11			
TH-TOTAL	7.53E-09	4.1E-11			
2-Methylnaphthalene	5.63E-11	3.1E-13			
			Total Pathway:	1.0E-09	

Total Rad + Chem 2.0E-09 *Total:* 2.0E-09

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TABLE B.3.3-11(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	4.82E-08	1.0E-04		
PU-238	2.92E-08	6.1E-05		
PU-239/240	7.56E-09	1.6E-05		
RA-226	7.11E-07	1.5E-03		
RA-228	8.07E-07	1.7E-03		
SR-90	3.13E-07	6.6E-04		
TH-228	9.76E-07	2.0E-03		
TH-230	9.97E-07	2.1E-03		
TH-232	8.39E-07	1.8E-03		
U-234	3.11E-06	6.5E-03		
U-235/236	2.12E-07	4.5E-04		
U-238	3.19E-06	6.7E-03		

Total Pathway:

Total

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.20E-08	7.7E-10		
Beryllium	8.18E-10	5.2E-11		
Dibenzo(a,h)anthracene	7.74E-10	4.9E-11		
Lead	8.61E-09	5.5E-10		
TH-TOTAL	7.53E-09	4.8E-10		
2-Methylnaphthalene	5.63E-11	3.6E-12		

Total Pathway:

Total Rad + Chem

Total:

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TABLE B.3.3-11(c)
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE OFF-PROPERTY FARMER (Private Ownership)
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	4.82E-08	5.6E-03	2.9E-08	1.6E-10	1.6E-10
PU-238	2.92E-08	3.4E-03	3.9E-08	1.3E-10	1.3E-10
PU-239/240	7.56E-09	8.8E-04	3.8E-08	3.3E-11	3.3E-11
RA-226	7.11E-07	8.2E-02	7.0E-09	5.8E-10	5.8E-10
RA-228	8.07E-07	9.4E-02	6.9E-10	6.5E-11	6.5E-11
SR-90	3.13E-07	3.6E-02	6.2E-11	2.2E-12	2.2E-12
TH-228	9.76E-07	1.1E-01	7.8E-08	8.8E-09	8.8E-09
TH-230	9.97E-07	1.2E-01	2.9E-08	3.4E-09	3.4E-09
TH-232	8.39E-07	9.7E-02	1.1E-07	1.1E-08	1.1E-08
U-234	3.11E-06	3.6E-01	2.6E-08	9.4E-09	9.4E-09
U-235/236	2.12E-07	2.5E-02	2.5E-08	6.1E-10	6.1E-10
U-238	3.19E-06	3.7E-01	5.2E-08	1.9E-08	1.9E-08
			Total Pathway:	5.3E-08	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.20E-08	7.8E-10	1.5E+01	1.2E-08	1.2E-08
Beryllium	8.18E-10	5.3E-11	8.4E+00	4.5E-10	4.5E-10
Dibenzo(a,h)anthracene	7.74E-10	5.0E-11	6.1E+00	3.1E-10	3.1E-10
Lead	8.61E-09	5.6E-10			
TH-TOTAL	7.53E-09	4.9E-10			
2-Methylnaphthalene	5.63E-11	3.6E-12			
			Total Pathway:	1.2E-08	

Total Rad + Chem 6.5E-08 *Total:* 6.5E-08

TABLE B.3.3-11(c)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	4.82E-08	5.6E-03		
PU-238	2.92E-08	3.4E-03		
PU-239/240	7.56E-09	8.8E-04		
RA-226	7.11E-07	8.2E-02		
RA-228	8.07E-07	9.4E-02		
SR-90	3.13E-07	3.6E-02		
TH-228	9.76E-07	1.1E-01		
TH-230	9.97E-07	1.2E-01		
TH-232	8.39E-07	9.7E-02		
U-234	3.11E-06	3.6E-01		
U-235/236	2.12E-07	2.5E-02		
U-238	3.19E-06	3.7E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.20E-08	7.8E-10		
Beryllium	8.18E-10	5.3E-11		
Dibenzo(a,h)anthracene	7.74E-10	5.0E-11		
Lead	8.61E-09	5.6E-10		
TH-TOTAL	7.53E-09	4.9E-10		
2-Methylnaphthalene	5.63E-11	3.6E-12		

Total Pathway:

Total Rad + Chem

Total

Total:

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TABLE B.3.3-11(d)
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE OFF-PROPERTY RESIDENT CHILD (Private Ownership)
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	4.82E-08	1.0E-04	2.9E-08	2.9E-12	2.9E-12
PU-238	2.92E-08	6.1E-05	3.9E-08	2.4E-12	2.4E-12
PU-239/240	7.56E-09	1.6E-05	3.8E-08	6.0E-13	6.0E-13
RA-226	7.11E-07	1.5E-03	7.0E-09	1.0E-11	1.0E-11
RA-228	8.07E-07	1.7E-03	6.9E-10	1.2E-12	1.2E-12
SR-90	3.13E-07	6.6E-04	6.2E-11	4.1E-14	4.1E-14
TH-228	9.76E-07	2.0E-03	7.8E-08	1.6E-10	1.6E-10
TH-230	9.97E-07	2.1E-03	2.9E-08	6.1E-11	6.1E-11
TH-232	8.39E-07	1.8E-03	1.1E-07	1.9E-10	1.9E-10
U-234	3.11E-06	6.5E-03	2.6E-08	1.7E-10	1.7E-10
U-235/236	2.12E-07	4.5E-04	2.5E-08	1.1E-11	1.1E-11
U-238	3.19E-06	6.7E-03	5.2E-08	3.5E-10	3.5E-10
			Total Pathway:	9.6E-10	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.20E-08	6.6E-11	1.5E+01	9.9E-10	9.9E-10
Beryllium	8.18E-10	4.5E-12	8.4E+00	3.8E-11	3.8E-11
Dibenzo(a,h)anthracene	7.74E-10	4.2E-12	6.1E+00	2.6E-11	2.6E-11
Lead	8.61E-09	4.7E-11			
TH-TOTAL	7.53E-09	4.1E-11			
2-Methylnaphthalene	5.63E-11	3.1E-13			
			Total Pathway:	1.0E-09	

Total Rad + Chem 2.0E-09 *Total:* 2.0E-09

TABLE B.3.3-11(d)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	4.82E-08	1.0E-04		
PU-238	2.92E-08	6.1E-05		
PU-239/240	7.56E-09	1.6E-05		
RA-226	7.11E-07	1.5E-03		
RA-228	8.07E-07	1.7E-03		
SR-90	3.13E-07	6.6E-04		
TH-228	9.76E-07	2.0E-03		
TH-230	9.97E-07	2.1E-03		
TH-232	8.39E-07	1.8E-03		
U-234	3.11E-06	6.5E-03		
U-235/236	2.12E-07	4.5E-04		
U-238	3.19E-06	6.7E-03		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.20E-08	7.7E-10		
Beryllium	8.18E-10	5.2E-11		
Dibenzo(a,h)anthracene	7.74E-10	4.9E-11		
Lead	8.61E-09	5.5E-10		
TH-TOTAL	7.53E-09	4.8E-10		
2-Methylnaphthalene	5.63E-11	3.6E-12		

Total Pathway:

Total Rad + Chem

Total	
Total:	

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TABLE B.3.3-12(a)

FUTURE OFF-PROPERTY FARMER (Federal Ownership)

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.30E-07	2.4E-04	2.2E-10	5.3E-14	NP-237	1.18E-08	8.7E-05	2.2E-10	1.9E-14	7.2E-14
PU-238	7.41E-10	1.4E-06	2.2E-10	3.0E-16	PU-238	1.48E-10	1.1E-06	2.2E-10	2.4E-16	5.4E-16
PU-239/240	2.06E-10	3.8E-07	2.3E-10	8.7E-17	PU-239/240	4.11E-11	3.0E-07	2.3E-10	7.0E-17	1.6E-16
RA-226	1.27E-05	2.3E-02	7.8E-10	1.8E-11	RA-226	2.28E-05	1.7E-01	7.8E-10	1.3E-10	1.5E-10
RA-228	9.19E-06	1.7E-02	1.0E-10	1.7E-12	RA-228	1.65E-05	1.2E-01	1.0E-10	1.2E-11	1.4E-11
SR-90	1.14E-04	2.1E-01	3.6E-11	7.5E-12	SR-90	5.71E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	2.42E-07	4.4E-04	5.5E-11	2.4E-14	TH-228	2.02E-07	1.5E-03	5.5E-11	8.2E-14	1.1E-13
TH-230	1.20E-06	2.2E-03	1.3E-11	2.9E-14	TH-230	1.00E-06	7.4E-03	1.3E-11	9.6E-14	1.2E-13
TH-232	1.02E-06	1.9E-03	1.7E-10	3.2E-13	TH-232	8.47E-07	6.2E-03	1.7E-10	1.1E-12	1.4E-12
U-234	2.69E-05	4.9E-02	1.6E-11	7.9E-13	U-234	8.06E-05	5.9E-01	1.6E-11	9.5E-12	1.0E-11
U-235/236	1.83E-06	3.4E-03	1.6E-11	5.4E-14	U-235/236	5.50E-06	4.0E-02	1.6E-11	6.5E-13	7.0E-13
U-238	2.76E-05	5.1E-02	2.8E-11	1.4E-12	U-238	8.27E-05	6.1E-01	2.8E-11	1.7E-11	1.8E-11
			Total Pathway:	3.0E-11				Total Pathway:	3.2E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.68E-06	3.8E-09	1.8E+00	6.6E-09	Arsenic	1.10E-07	4.5E-10	1.8E+00	7.9E-10	7.4E-09
Beryllium	8.02E-08	8.2E-11	4.3E+00	3.5E-10	Beryllium	7.22E-11	3.0E-13	4.3E+00	1.3E-12	3.6E-10
Dibenzo(a,h)anthracene	6.25E-06	6.4E-09	7.3E+00	4.7E-08	Dibenzo(a,h)anthracene	1.98E-06	8.1E-09	7.3E+00	5.9E-08	1.1E-07
Lead	1.71E-07	1.8E-10			Lead	1.42E-07	5.8E-10			
TH-TOTAL	9.12E-09	9.4E-12			TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	1.97E-09	2.0E-12			2-Methylnaphthalene	6.22E-10	2.6E-12			
			Total Pathway:	5.4E-08				Total Pathway:	6.0E-08	
			Total Rad + Chem	5.4E-08				Total Rad + Chem	6.0E-08	*Total:* 1.1E-07

TABLE B.3.3-12(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	1.3E-07	2.4E-04			NP-237	1.18E-08	8.7E-05			
PU-238	7.4E-10	1.4E-06			PU-238	1.48E-10	1.1E-06			
PU-239/240	2.1E-10	3.8E-07			PU-239/240	4.11E-11	3.0E-07			
RA-226	1.3E-05	2.3E-02			RA-226	2.28E-05	1.7E-01			
RA-228	9.2E-06	1.7E-02			RA-228	1.65E-05	1.2E-01			
SR-90	1.1E-04	2.1E-01			SR-90	5.71E-04	4.2E+00			
TH-228	2.4E-07	4.4E-04			TH-228	2.02E-07	1.5E-03			
TH-230	1.2E-06	2.2E-03			TH-230	1.00E-06	7.4E-03			
TH-232	1.0E-06	1.9E-03			TH-232	8.47E-07	6.2E-03			
U-234	2.7E-05	4.9E-02			U-234	8.06E-05	5.9E-01			
U-235/236	1.8E-06	3.4E-03			U-235/236	5.50E-06	4.0E-02			
U-238	2.8E-05	5.1E-02			U-238	8.27E-05	6.1E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	3.7E-06	3.8E-09	3.0E-04	1.3E-05	Arsenic	1.10E-07	4.5E-10	3.0E-04	1.5E-06	1.4E-05
Beryllium	8.0E-08	8.2E-11	5.0E-03	1.6E-08	Beryllium	7.22E-11	3.0E-13	5.0E-03	5.9E-11	1.7E-08
Dibenzo(a,h)anthracene	6.3E-06	6.4E-09			Dibenzo(a,h)anthracene	1.98E-06	8.1E-09			
Lead	1.7E-07	1.8E-10			Lead	1.42E-07	5.8E-10			
TH-TOTAL	9.1E-09	9.4E-12			TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	2.0E-09	2.0E-12			2-Methylnaphthalene	6.22E-10	2.6E-12			
		Total Pathway:		1.3E-05			Total Pathway:		1.5E-06	
		Total Rad + Chem		1.3E-05			Total Rad + Chem		1.5E-06	*Total:* 1.4E-05

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TABLE B.3.3-12(a)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.04E-06	9.3E-03	2.2E-10	2.0E-12
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	5.13E-03	9.4E+00	3.6E-11	3.4E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.40E+00	2.6E+03	1.6E-11	4.1E-08
U-235/236	7.47E-02	1.4E+02	1.6E-11	2.2E-09
U-238	1.55E+00	2.8E+03	2.8E-11	8.0E-08
TC-99	3.43E+00	6.3E+03	1.3E-12	8.2E-09

Total Pathway: 1.3E-07

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
NP-237	4.72E-07	3.5E-03	2.2E-10	7.6E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.57E-02	1.9E+02	3.6E-11	6.8E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.35E+00	3.2E+04	1.6E-11	5.1E-07
U-235/236	2.32E-01	1.7E+03	1.6E-11	2.7E-08
U-238	4.80E+00	3.5E+04	2.8E-11	9.9E-07
TC-99	4.13E+00	3.0E+04	1.3E-12	3.9E-08

Total Pathway: 1.6E-06

Total	Total Dust & Groundwater Affected
2.8E-12	2.9E-12
	5.4E-16
	1.6E-16
	1.5E-10
	1.4E-11
7.1E-09	7.3E-09
	1.1E-13
	1.2E-13
	1.4E-12
5.5E-07	5.5E-07
2.9E-08	2.9E-08
1.1E-06	1.1E-06
4.8E-08	4.8E-08

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.52E-18	2.6E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.51E-03	5.7E-06		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.15E-18	8.8E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	7.0E-05		

Total Pathway:

			7.4E-09
			3.6E-10
			1.1E-07

Total Rad + Chem 1.3E-07

Total Rad + Chem 1.6E-06 | *Total:* | 1.7E-06 | 1.8E-06 |

TABLE B.3.3-12(a)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.0E-06	9.3E-03		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	5.1E-03	9.4E+00		
TH-228				
TH-230				
TH-232				
U-234	1.4E+00	2.6E+03		
U-235/236	7.5E-02	1.4E+02		
U-238	1.5E+00	2.8E+03		
TC-99	3.4E+00	6.3E+03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.72E-07	3.5E-03		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	2.57E-02	1.9E+02		
TH-228				
TH-230				
TH-232				
U-234	4.35E+00	3.2E+04		
U-235/236	2.32E-01	1.7E+03		
U-238	4.80E+00	3.5E+04		
TC-99	4.13E+00	3.0E+04		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.5E-18	2.6E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.5E-03	5.7E-06	5.0E-03	1.1E-03

Total Pathway: 1.1E-03

Total Rad + Chem 1.1E-03

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.15E-18	8.8E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	7.0E-05	5.0E-03	1.4E-02

Total Pathway: 1.4E-02

Total Rad + Chem 1.4E-02

	Total	Total Dust & Groundwater Affected
		1.4E-05
		1.7E-08
	1.5E-02	1.5E-02
Total:	1.5E-02	1.5E-02

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TABLE B.3.3-12(b)

FUTURE OFF-PROPERTY CHILD (Federal Ownership)

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.30E-07	7.9E-06	2.2E-10	1.7E-15	NP-237	1.18E-08	1.7E-05	2.2E-10	3.7E-15	5.5E-15
PU-238	7.41E-10	4.5E-08	2.2E-10	9.9E-18	PU-238	1.48E-10	2.1E-07	2.2E-10	4.7E-17	5.6E-17
PU-239/240	2.06E-10	1.3E-08	2.3E-10	2.9E-18	PU-239/240	4.11E-11	5.9E-08	2.3E-10	1.4E-17	1.6E-17
RA-226	1.27E-05	7.7E-04	7.8E-10	6.0E-13	RA-226	2.28E-05	3.3E-02	7.8E-10	2.5E-11	2.6E-11
RA-228	9.19E-06	5.6E-04	1.0E-10	5.6E-14	RA-228	1.65E-05	2.4E-02	1.0E-10	2.4E-12	2.4E-12
SR-90	1.14E-04	7.0E-03	3.6E-11	2.5E-13	SR-90	5.71E-04	8.1E-01	3.6E-11	2.9E-11	3.0E-11
TH-228	2.42E-07	1.5E-05	5.5E-11	8.1E-16	TH-228	2.02E-07	2.9E-04	5.5E-11	1.6E-14	1.7E-14
TH-230	1.20E-06	7.3E-05	1.3E-11	9.5E-16	TH-230	1.00E-06	1.4E-03	1.3E-11	1.9E-14	2.0E-14
TH-232	1.02E-06	6.2E-05	1.7E-10	1.1E-14	TH-232	8.47E-07	1.2E-03	1.7E-10	2.1E-13	2.2E-13
U-234	2.69E-05	1.6E-03	1.6E-11	2.6E-14	U-234	8.06E-05	1.2E-01	1.6E-11	1.8E-12	1.9E-12
U-235/236	1.83E-06	1.1E-04	1.6E-11	1.8E-15	U-235/236	5.50E-06	7.8E-03	1.6E-11	1.3E-13	1.3E-13
U-238	2.76E-05	1.7E-03	2.8E-11	4.7E-14	U-238	8.27E-05	1.2E-01	2.8E-11	3.3E-12	3.4E-12
			Total Pathway:	1.0E-12				Total Pathway:	6.3E-11	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.68E-06	5.8E-10	1.8E+00	1.0E-09	Arsenic	1.10E-07	4.1E-10	1.8E+00	7.2E-10	1.7E-09
Beryllium	8.02E-08	1.3E-11	4.3E+00	5.5E-11	Beryllium	7.22E-11	2.7E-13	4.3E+00	1.2E-12	5.6E-11
Dibenzo(a,h)anthracene	6.25E-06	9.9E-10	7.3E+00	7.3E-09	Dibenzo(a,h)anthracene	1.98E-06	7.4E-09	7.3E+00	5.4E-08	6.1E-08
Lead	1.71E-07	2.7E-11			Lead	1.42E-07	5.3E-10			
TH-TOTAL	9.12E-09	1.4E-12			TH-TOTAL	7.60E-09	2.8E-11			
2-Methylnaphthalene	1.97E-09	3.1E-13			2-Methylnaphthalene	6.22E-10	2.3E-12			
			Total Pathway:	8.3E-09				Total Pathway:	5.5E-08	
			Total Rad + Chem	8.3E-09				Total Rad + Chem	5.5E-08	*Total:* 6.3E-08

TABLE B.3.3-12(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.3E-07	7.9E-06		
PU-238	7.4E-10	4.5E-08		
PU-239/240	2.1E-10	1.3E-08		
RA-226	1.3E-05	7.7E-04		
RA-228	9.2E-06	5.6E-04		
SR-90	1.1E-04	7.0E-03		
TH-228	2.4E-07	1.5E-05		
TH-230	1.2E-06	7.3E-05		
TH-232	1.0E-06	6.2E-05		
U-234	2.7E-05	1.6E-03		
U-235/236	1.8E-06	1.1E-04		
U-238	2.8E-05	1.7E-03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	1.18E-08	1.7E-05		
PU-238	1.48E-10	2.1E-07		
PU-239/240	4.11E-11	5.9E-08		
RA-226	2.28E-05	3.3E-02		
RA-228	1.65E-05	2.4E-02		
SR-90	5.71E-04	8.1E-01		
TH-228	2.02E-07	2.9E-04		
TH-230	1.00E-06	1.4E-03		
TH-232	8.47E-07	1.2E-03		
U-234	8.06E-05	1.2E-01		
U-235/236	5.50E-06	7.8E-03		
U-238	8.27E-05	1.2E-01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.7E-06	6.8E-09	3.0E-04	2.3E-05
Beryllium	8.0E-08	1.5E-10	5.0E-03	3.0E-08
Dibenzo(a,h)anthracene	6.3E-06	1.2E-08		
Lead	1.7E-07	3.2E-10		
TH-TOTAL	9.1E-09	1.7E-11		
2-Methylnaphthalene	2.0E-09	3.6E-12		

Total Pathway: 2.3E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic	1.10E-07	4.8E-09	3.0E-04	1.6E-05
Beryllium	7.22E-11	3.1E-12	5.0E-03	6.3E-10
Dibenzo(a,h)anthracene	1.98E-06	8.6E-08		
Lead	1.42E-07	6.2E-09		
TH-TOTAL	7.60E-09	3.3E-10		
2-Methylnaphthalene	6.22E-10	2.7E-11		

Total Pathway: 1.6E-05

	Total
	3.9E-05
	3.0E-08

Total Rad + Chem 2.3E-05

Total Rad + Chem 1.6E-05 *Total:* 3.9E-05

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TABLE B.3.3-12(b)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.04E-06	3.1E-04	2.2E-10	6.8E-14
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	5.13E-03	3.1E-01	3.6E-11	1.1E-11
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.40E+00	8.5E+01	1.6E-11	1.4E-09
U-235/236	7.47E-02	4.5E+00	1.6E-11	7.3E-11
U-238	1.55E+00	9.4E+01	2.8E-11	2.6E-09
TC-99	3.43E+00	2.1E+02	1.3E-12	2.7E-10

Total Pathway: 4.4E-09

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
NP-237	4.72E-07	6.7E-04	2.2E-10	1.5E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.57E-02	3.7E+01	3.6E-11	1.3E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.35E+00	6.2E+03	1.6E-11	9.9E-08
U-235/236	2.32E-01	3.3E+02	1.6E-11	5.3E-09
U-238	4.80E+00	6.9E+03	2.8E-11	1.9E-07
TC-99	4.13E+00	5.9E+03	1.3E-12	7.7E-09

Total Pathway: 3.1E-07

	Total	Total Dust & Groundwater Affected
NP-237	2.2E-13	2.2E-13
PU-238		5.6E-17
PU-239/240		1.6E-17
RA-226		2.6E-11
RA-228		2.4E-12
SR-90	1.3E-09	1.4E-09
TH-228		1.7E-14
TH-230		2.0E-14
TH-232		2.2E-13
U-234	1.0E-07	1.0E-07
U-235/236	5.4E-09	5.4E-09
U-238	1.9E-07	1.9E-07
TC-99	7.9E-09	7.9E-09

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.52E-18	4.0E-22		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.51E-03	8.8E-07		

Total Pathway:

Total Rad + Chem 4.4E-09

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.15E-18	8.0E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	6.4E-05		

Total Pathway:

Total Rad + Chem 3.1E-07

		1.7E-09
		5.6E-11
		6.1E-08

Total: 3.1E-07 3.7E-07

TABLE B.3.3-12(b)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.0E-06	3.1E-04		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	5.1E-03	3.1E-01		
TH-228				
TH-230				
TH-232				
U-234	1.4E+00	8.5E+01		
U-235/236	7.5E-02	4.5E+00		
U-238	1.5E+00	9.4E+01		
TC-99	3.4E+00	2.1E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.72E-07	6.7E-04		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	2.57E-02	3.7E+01		
TH-228				
TH-230				
TH-232				
U-234	4.35E+00	6.2E+03		
U-235/236	2.32E-01	3.3E+02		
U-238	4.80E+00	6.9E+03		
TC-99	4.13E+00	5.9E+03		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.5E-18	4.7E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.5E-03	1.0E-05	5.0E-03	2.0E-03

Total Pathway: 2.0E-03

Total Rad + Chem 2.0E-03

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.15E-18	9.3E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	7.4E-04	5.0E-03	1.5E-01

Total Pathway: 1.5E-01

Total Rad + Chem 1.5E-01

	Total	Total Dust & Groundwater Affected
		3.9E-05
		3.0E-08
	1.5E-01	1.5E-01
Total:	1.5E-01	1.5E-01

TABLE B.3.3-12(b)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.04E-06	3.1E-04	2.2E-10	6.8E-14
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	5.13E-03	3.1E-01	3.6E-11	1.1E-11
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.40E+00	8.5E+01	1.6E-11	1.4E-09
U-235/236	7.47E-02	4.5E+00	1.6E-11	7.3E-11
U-238	1.55E+00	9.4E+01	2.8E-11	2.6E-09
TC-99	3.43E+00	2.1E+02	1.3E-12	2.7E-10

Total Pathway: 4.4E-09

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
NP-237	4.72E-07	6.7E-04	2.2E-10	1.5E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.57E-02	3.7E+01	3.6E-11	1.3E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.35E+00	6.2E+03	1.6E-11	9.9E-08
U-235/236	2.32E-01	3.3E+02	1.6E-11	5.3E-09
U-238	4.80E+00	6.9E+03	2.8E-11	1.9E-07
TC-99	4.13E+00	5.9E+03	1.3E-12	7.7E-09

Total Pathway: 3.1E-07

Total	Total Dust & Groundwater Affected
2.2E-13	2.2E-13
	5.6E-17
	1.6E-17
	2.6E-11
	2.4E-12
1.3E-09	1.4E-09
	1.7E-14
	2.0E-14
	2.2E-13
1.0E-07	1.0E-07
5.4E-09	5.4E-09
1.9E-07	1.9E-07
7.9E-09	7.9E-09

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.52E-18	4.0E-22		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.51E-03	8.8E-07		

Total Pathway:

Total Rad + Chem 4.4E-09

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.15E-18	8.0E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	6.4E-05		

Total Pathway:

Total Rad + Chem 3.1E-07

	1.7E-09	
	5.6E-11	
	6.1E-08	
Total:	3.1E-07	3.7E-07

TABLE B.3.3-12(b)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.0E-06	3.1E-04		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	5.1E-03	3.1E-01		
TH-228				
TH-230				
TH-232				
U-234	1.4E+00	8.5E+01		
U-235/236	7.5E-02	4.5E+00		
U-238	1.5E+00	9.4E+01		
TC-99	3.4E+00	2.1E+02		
			Total Pathway:	

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.72E-07	6.7E-04		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	2.57E-02	3.7E+01		
TH-228				
TH-230				
TH-232				
U-234	4.35E+00	6.2E+03		
U-235/236	2.32E-01	3.3E+02		
U-238	4.80E+00	6.9E+03		
TC-99	4.13E+00	5.9E+03		
			Total Pathway:	

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.5E-18	4.7E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.5E-03	1.0E-05	5.0E-03	2.0E-03
			Total Pathway:	2.0E-03
			Total Rad + Chem	2.0E-03

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.15E-18	9.3E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	7.4E-04	5.0E-03	1.5E-01
			Total Pathway:	1.5E-01
			Total Rad + Chem	1.5E-01

	Total	Total Dust & Groundwater Affected
		3.9E-05
		3.0E-08
	1.5E-01	1.5E-01
Total:	1.5E-01	1.5E-01

TABLE B.3.3-12(c)

FUTURE OFF-PROPERTY FARMER (Private Ownership)

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.30E-07	2.4E-04	2.2E-10	5.3E-14
PU-238	7.41E-10	1.4E-06	2.2E-10	3.0E-16
PU-239/240	2.06E-10	3.8E-07	2.3E-10	8.7E-17
RA-226	1.27E-05	2.3E-02	7.8E-10	1.8E-11
RA-228	9.19E-06	1.7E-02	1.0E-10	1.7E-12
SR-90	1.14E-04	2.1E-01	3.6E-11	7.5E-12
TH-228	2.42E-07	4.4E-04	5.5E-11	2.4E-14
TH-230	1.20E-06	2.2E-03	1.3E-11	2.9E-14
TH-232	1.02E-06	1.9E-03	1.7E-10	3.2E-13
U-234	2.69E-05	4.9E-02	1.6E-11	7.9E-13
U-235/236	1.83E-06	3.4E-03	1.6E-11	5.4E-14
U-238	2.76E-05	5.1E-02	2.8E-11	1.4E-12

Total Pathway: 3.0E-11

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	Total
NP-237	1.18E-08	8.7E-05	2.2E-10	1.9E-14	7.2E-14
PU-238	1.48E-10	1.1E-06	2.2E-10	2.4E-16	5.4E-16
PU-239/240	4.11E-11	3.0E-07	2.3E-10	7.0E-17	1.6E-16
RA-226	2.28E-05	1.7E-01	7.8E-10	1.3E-10	1.5E-10
RA-228	1.65E-05	1.2E-01	1.0E-10	1.2E-11	1.4E-11
SR-90	5.71E-04	4.2E+00	3.6E-11	1.5E-10	1.6E-10
TH-228	2.02E-07	1.5E-03	5.5E-11	8.2E-14	1.1E-13
TH-230	1.00E-06	7.4E-03	1.3E-11	9.6E-14	1.2E-13
TH-232	8.47E-07	6.2E-03	1.7E-10	1.1E-12	1.4E-12
U-234	8.06E-05	5.9E-01	1.6E-11	9.5E-12	1.0E-11
U-235/236	5.50E-06	4.0E-02	1.6E-11	6.5E-13	7.0E-13
U-238	8.27E-05	6.1E-01	2.8E-11	1.7E-11	1.8E-11

Total Pathway: 3.2E-10

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	3.68E-06	3.8E-09	1.8E+00	6.6E-09
Beryllium	8.02E-08	8.2E-11	4.3E+00	3.5E-10
Dibenzo(a,h)anthracene	6.25E-06	6.4E-09	7.3E+00	4.7E-08
Lead	1.71E-07	1.8E-10		
TH-TOTAL	9.12E-09	9.4E-12		
2-Methylnaphthalene	1.97E-09	2.0E-12		

Total Pathway: 5.4E-08

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.10E-07	4.5E-10	1.8E+00	7.9E-10	7.4E-09
Beryllium	7.22E-11	3.0E-13	4.3E+00	1.3E-12	3.6E-10
Dibenzo(a,h)anthracene	1.98E-06	8.1E-09	7.3E+00	5.9E-08	1.1E-07
Lead	1.42E-07	5.8E-10			
TH-TOTAL	7.60E-09	3.1E-11			
2-Methylnaphthalene	6.22E-10	2.6E-12			

Total Pathway: 6.0E-08

Total Rad + Chem 5.4E-08

Total Rad + Chem 6.0E-08 *Total:* 1.1E-07

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TABLE B.3.3-12(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.3E-07	2.4E-04		
PU-238	7.4E-10	1.4E-06		
PU-239/240	2.1E-10	3.8E-07		
RA-226	1.3E-05	2.3E-02		
RA-228	9.2E-06	1.7E-02		
SR-90	1.1E-04	2.1E-01		
TH-228	2.4E-07	4.4E-04		
TH-230	1.2E-06	2.2E-03		
TH-232	1.0E-06	1.9E-03		
U-234	2.7E-05	4.9E-02		
U-235/236	1.8E-06	3.4E-03		
U-238	2.8E-05	5.1E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	1.18E-08	8.7E-05		
PU-238	1.48E-10	1.1E-06		
PU-239/240	4.11E-11	3.0E-07		
RA-226	2.28E-05	1.7E-01		
RA-228	1.65E-05	1.2E-01		
SR-90	5.71E-04	4.2E+00		
TH-228	2.02E-07	1.5E-03		
TH-230	1.00E-06	7.4E-03		
TH-232	8.47E-07	6.2E-03		
U-234	8.06E-05	5.9E-01		
U-235/236	5.50E-06	4.0E-02		
U-238	8.27E-05	6.1E-01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.7E-06	3.8E-09	3.0E-04	1.3E-05
Beryllium	8.0E-08	8.2E-11	5.0E-03	1.6E-08
Dibenzo(a,h)anthracene	6.3E-06	6.4E-09		
Lead	1.7E-07	1.8E-10		
TH-TOTAL	9.1E-09	9.4E-12		
2-Methylnaphthalene	2.0E-09	2.0E-12		

Total Pathway: 1.3E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic	1.10E-07	4.5E-10	3.0E-04	1.5E-06
Beryllium	7.22E-11	3.0E-13	5.0E-03	5.9E-11
Dibenzo(a,h)anthracene	1.98E-06	8.1E-09		
Lead	1.42E-07	5.8E-10		
TH-TOTAL	7.60E-09	3.1E-11		
2-Methylnaphthalene	6.22E-10	2.6E-12		

Total Pathway: 1.5E-06

Total Rad + Chem	1.3E-05	Total Rad + Chem	1.5E-06

Total	
1.4E-05	
1.7E-08	
Total:	1.4E-05

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TABLE B.3.3-12(c)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.04E-06	9.3E-03	2.2E-10	2.0E-12
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	5.13E-03	9.4E+00	3.6E-11	3.4E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.40E+00	2.6E+03	1.6E-11	4.1E-08
U-235/236	7.47E-02	1.4E+02	1.6E-11	2.2E-09
U-238	1.55E+00	2.8E+03	2.8E-11	8.0E-08
TC-99	3.43E+00	6.3E+03	1.3E-12	8.2E-09

Total Pathway: 1.3E-07

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
NP-237	4.72E-07	3.5E-03	2.2E-10	7.6E-13
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.57E-02	1.9E+02	3.6E-11	6.8E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.35E+00	3.2E+04	1.6E-11	5.1E-07
U-235/236	2.32E-01	1.7E+03	1.6E-11	2.7E-08
U-238	4.80E+00	3.5E+04	2.8E-11	9.9E-07
TC-99	4.13E+00	3.0E+04	1.3E-12	3.9E-08

Total Pathway: 1.6E-06

Total	Total Dust & Groundwater Affected
2.8E-12	2.9E-12
	5.4E-16
	1.6E-16
	1.5E-10
	1.4E-11
7.1E-09	7.3E-09
	1.1E-13
	1.2E-13
	1.4E-12
5.5E-07	5.5E-07
2.9E-08	2.9E-08
1.1E-06	1.1E-06
4.8E-08	4.8E-08

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.52E-18	2.6E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.51E-03	5.7E-06		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	2.15E-18	8.8E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	7.0E-05		

Total Pathway:

			7.4E-09
			3.6E-10
			1.1E-07

Total Rad + Chem 1.3E-07

Total Rad + Chem 1.6E-06

Total:	1.7E-06	1.8E-06

TABLE B.3.3-12(c)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.0E-06	9.3E-03		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	5.1E-03	9.4E+00		
TH-228				
TH-230				
TH-232				
U-234	1.4E+00	2.6E+03		
U-235/236	7.5E-02	1.4E+02		
U-238	1.5E+00	2.8E+03		
TC-99	3.4E+00	6.3E+03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.72E-07	3.5E-03		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	2.57E-02	1.9E+02		
TH-228				
TH-230				
TH-232				
U-234	4.35E+00	3.2E+04		
U-235/236	2.32E-01	1.7E+03		
U-238	4.80E+00	3.5E+04		
TC-99	4.13E+00	3.0E+04		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.5E-18	2.6E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	5.5E-03	5.7E-06	5.0E-03	1.1E-03

Total Pathway: 1.1E-03

Total Rad + Chem 1.1E-03

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	2.15E-18	8.8E-21		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	1.71E-02	7.0E-05	5.0E-03	1.4E-02

Total Pathway: 1.4E-02

Total Rad + Chem 1.4E-02

Total	Total Dust & Groundwater Affected
	1.4E-05
	1.7E-08
1.5E-02	1.5E-02

Total: 1.5E-02 1.5E-02

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TABLE B.3.3-12(d)

FUTURE OFF-PROPERTY CHILD (Private Ownership)

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.30E-07	7.9E-06	2.2E-10	1.7E-15	NP-237	1.18E-08	1.7E-05	2.2E-10	3.7E-15	5.5E-15
PU-238	7.41E-10	4.5E-08	2.2E-10	9.9E-18	PU-238	1.48E-10	2.1E-07	2.2E-10	4.7E-17	5.6E-17
PU-239/240	2.06E-10	1.3E-08	2.3E-10	2.9E-18	PU-239/240	4.11E-11	5.9E-08	2.3E-10	1.4E-17	1.6E-17
RA-226	1.27E-05	7.7E-04	7.8E-10	6.0E-13	RA-226	2.28E-05	3.3E-02	7.8E-10	2.5E-11	2.6E-11
RA-228	9.19E-06	5.6E-04	1.0E-10	5.6E-14	RA-228	1.65E-05	2.4E-02	1.0E-10	2.4E-12	2.4E-12
SR-90	1.14E-04	7.0E-03	3.6E-11	2.5E-13	SR-90	5.71E-04	8.1E-01	3.6E-11	2.9E-11	3.0E-11
TH-228	2.42E-07	1.5E-05	5.5E-11	8.1E-16	TH-228	2.02E-07	2.9E-04	5.5E-11	1.6E-14	1.7E-14
TH-230	1.20E-06	7.3E-05	1.3E-11	9.5E-16	TH-230	1.00E-06	1.4E-03	1.3E-11	1.9E-14	2.0E-14
TH-232	1.02E-06	6.2E-05	1.7E-10	1.1E-14	TH-232	8.47E-07	1.2E-03	1.7E-10	2.1E-13	2.2E-13
U-234	2.69E-05	1.6E-03	1.6E-11	2.6E-14	U-234	8.06E-05	1.2E-01	1.6E-11	1.8E-12	1.9E-12
U-235/236	1.83E-06	1.1E-04	1.6E-11	1.8E-15	U-235/236	5.50E-06	7.8E-03	1.6E-11	1.3E-13	1.3E-13
U-238	2.76E-05	1.7E-03	2.8E-11	4.7E-14	U-238	8.27E-05	1.2E-01	2.8E-11	3.3E-12	3.4E-12
			Total Pathway:	1.0E-12				Total Pathway:	6.3E-11	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.68E-06	5.8E-10	1.8E+00	1.0E-09	Arsenic	1.10E-07	4.1E-10	1.8E+00	7.2E-10	1.7E-09
Beryllium	8.02E-08	1.3E-11	4.3E+00	5.5E-11	Beryllium	7.22E-11	2.7E-13	4.3E+00	1.2E-12	5.6E-11
Dibenzo(a,h)anthracene	6.25E-06	9.9E-10	7.3E+00	7.3E-09	Dibenzo(a,h)anthracene	1.98E-06	7.4E-09	7.3E+00	5.4E-08	6.1E-08
Lead	1.71E-07	2.7E-11			Lead	1.42E-07	5.3E-10			
TH-TOTAL	9.12E-09	1.4E-12			TH-TOTAL	7.60E-09	2.8E-11			
2-Methylnaphthalene	1.97E-09	3.1E-13			2-Methylnaphthalene	6.22E-10	2.3E-12			
			Total Pathway:	8.3E-09				Total Pathway:	5.5E-08	
			Total Rad + Chem	8.3E-09				Total Rad + Chem	5.5E-08	*Total:* 6.3E-08

TABLE B.3.3-12(d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	1.3E-07	7.9E-06			NP-237	1.18E-08	1.7E-05			
PU-238	7.4E-10	4.5E-08			PU-238	1.48E-10	2.1E-07			
PU-239/240	2.1E-10	1.3E-08			PU-239/240	4.11E-11	5.9E-08			
RA-226	1.3E-05	7.7E-04			RA-226	2.28E-05	3.3E-02			
RA-228	9.2E-06	5.6E-04			RA-228	1.65E-05	2.4E-02			
SR-90	1.1E-04	7.0E-03			SR-90	5.71E-04	8.1E-01			
TH-228	2.4E-07	1.5E-05			TH-228	2.02E-07	2.9E-04			
TH-230	1.2E-06	7.3E-05			TH-230	1.00E-06	1.4E-03			
TH-232	1.0E-06	6.2E-05			TH-232	8.47E-07	1.2E-03			
U-234	2.7E-05	1.6E-03			U-234	8.06E-05	1.2E-01			
U-235/236	1.8E-06	1.1E-04			U-235/236	5.50E-06	7.8E-03			
U-238	2.8E-05	1.7E-03			U-238	8.27E-05	1.2E-01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	3.7E-06	6.8E-09	3.0E-04	2.3E-05	Arsenic	1.10E-07	4.8E-09	3.0E-04	1.6E-05	3.9E-05
Beryllium	8.0E-08	1.5E-10	5.0E-03	3.0E-08	Beryllium	7.22E-11	3.1E-12	5.0E-03	6.3E-10	3.0E-08
Dibenzo(a,h)anthracene	6.3E-06	1.2E-08			Dibenzo(a,h)anthracene	1.98E-06	8.6E-08			
Lead	1.7E-07	3.2E-10			Lead	1.42E-07	6.2E-09			
TH-TOTAL	9.1E-09	1.7E-11			TH-TOTAL	7.60E-09	3.3E-10			
2-Methylnaphthalene	2.0E-09	3.6E-12			2-Methylnaphthalene	6.22E-10	2.7E-11			
			Total Pathway:	2.3E-05				Total Pathway:	1.6E-05	
			Total Rad + Chem	2.3E-05				Total Rad + Chem	1.6E-05	*Total:* 3.9E-05

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TABLE B.3.3-13(a)

FUTURE OFF-PROPERTY FARMER (Federal Ownership)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	2.38E-08	4.7E-02	2.2E-10	1.0E-11	NP-237	2.38E-08	2.5E-02	2.2E-10	5.5E-12	1.6E-11
PU-238	1.43E-08	2.8E-02	2.2E-10	6.2E-12	PU-238	1.43E-08	1.5E-02	2.2E-10	3.3E-12	9.5E-12
PU-239/240	3.70E-09	7.3E-03	2.3E-10	1.7E-12	PU-239/240	3.70E-09	3.9E-03	2.3E-10	8.9E-13	2.6E-12
RA-226	3.58E-07	7.1E-01	7.8E-10	5.5E-10	RA-226	3.58E-07	3.7E-01	7.8E-10	2.9E-10	8.4E-10
RA-228	3.96E-07	7.8E-01	1.0E-10	7.8E-11	RA-228	3.92E-07	4.1E-01	1.0E-10	4.1E-11	1.2E-10
SR-90	4.67E-07	9.2E-01	3.6E-11	3.3E-11	SR-90	4.66E-07	4.9E-01	3.6E-11	1.8E-11	5.1E-11
TH-228	4.77E-07	9.4E-01	5.5E-11	5.2E-11	TH-228	4.64E-07	4.8E-01	5.5E-11	2.7E-11	7.8E-11
TH-230	4.98E-07	9.8E-01	1.3E-11	1.3E-11	TH-230	4.98E-07	5.2E-01	1.3E-11	6.8E-12	2.0E-11
TH-232	4.19E-07	8.3E-01	1.7E-10	1.4E-10	TH-232	4.19E-07	4.4E-01	1.7E-10	7.4E-11	2.1E-10
U-234	1.52E-06	3.0E+00	1.6E-11	4.8E-11	U-234	1.52E-06	1.6E+00	1.6E-11	2.5E-11	7.3E-11
U-235/236	1.04E-07	2.0E-01	1.6E-11	3.3E-12	U-235/236	1.04E-07	1.1E-01	1.6E-11	1.7E-12	5.0E-12
U-238	1.56E-06	3.1E+00	2.8E-11	8.6E-11	U-238	1.56E-06	1.6E+00	2.8E-11	4.6E-11	1.3E-10
			Total Pathway:	1.0E-09				Total Pathway:	5.4E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	7.23E-06	8.0E-09	1.8E+00	1.4E-08	Arsenic	7.23E-06	4.2E-09	1.8E+00	7.4E-09	2.1E-08
Beryllium	4.29E-07	4.7E-10	4.3E+00	2.0E-09	Beryllium	4.29E-07	2.5E-10	4.3E+00	1.1E-09	3.1E-09
Dibenzo(a,h)anthracene	3.87E-07	4.3E-10	7.3E+00	3.1E-09	Dibenzo(a,h)anthracene	3.85E-07	2.2E-10	7.3E+00	1.6E-09	4.7E-09
Lead	4.49E-06	4.9E-09			Lead	4.49E-06	2.6E-09			
TH-TOTAL	3.76E-06	4.1E-09			TH-TOTAL	3.76E-06	2.2E-09			
2-Methylnaphthalene	9.65E-08	1.1E-10			2-Methylnaphthalene	9.65E-08	5.6E-11			
			Total Pathway:	1.9E-08				Total Pathway:	1.0E-08	
			Total Rad + Chem	2.0E-08				Total Rad + Chem	1.1E-08	*Total:* 3.1E-08

TABLE B.3.3-13(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.4E-08	4.7E-02		
PU-238	1.4E-08	2.8E-02		
PU-239/240	3.7E-09	7.3E-03		
RA-226	3.6E-07	7.1E-01		
RA-228	4.0E-07	7.8E-01		
SR-90	4.7E-07	9.2E-01		
TH-228	4.8E-07	9.4E-01		
TH-230	5.0E-07	9.8E-01		
TH-232	4.2E-07	8.3E-01		
U-234	1.5E-06	3.0E+00		
U-235/236	1.0E-07	2.0E-01		
U-238	1.6E-06	3.1E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.38E-08	2.5E-02		
PU-238	1.43E-08	1.5E-02		
PU-239/240	3.70E-09	3.9E-03		
RA-226	3.58E-07	3.7E-01		
RA-228	3.92E-07	4.1E-01		
SR-90	4.66E-07	4.9E-01		
TH-228	4.64E-07	4.8E-01		
TH-230	4.98E-07	5.2E-01		
TH-232	4.19E-07	4.4E-01		
U-234	1.52E-06	1.6E+00		
U-235/236	1.04E-07	1.1E-01		
U-238	1.56E-06	1.6E+00		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.2E-06	8.0E-09	3.0E-04	2.7E-05
Beryllium	4.3E-07	4.7E-10	5.0E-03	9.5E-08
Dibenzo(a,h)anthracene	3.9E-07	4.3E-10		
Lead	4.5E-06	4.9E-09		
TH-TOTAL	3.8E-06	4.1E-09		
2-Methylnaphthalene	9.6E-08	1.1E-10		

Total Pathway: 2.7E-05

Total Rad + Chem 2.7E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.23E-06	4.2E-09	3.0E-04	1.4E-05
Beryllium	4.29E-07	2.5E-10	5.0E-03	5.0E-08
Dibenzo(a,h)anthracene	3.85E-07	2.2E-10		
Lead	4.49E-06	2.6E-09		
TH-TOTAL	3.76E-06	2.2E-09		
2-Methylnaphthalene	9.65E-08	5.6E-11		

Total Pathway: 1.4E-05

Total Rad + Chem 1.4E-05

Total	
	4.1E-05
	1.4E-07

Total: 4.1E-05

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TABLE B.3.3-13(a)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk		
NP-237	1.39E-06	2.7E+00	2.2E-10	6.0E-10	NP-237	1.39E-06	1.5E+00	2.2E-10	3.2E-10	9.2E-10	9.4E-10
PU-238			2.2E-10		PU-238			2.2E-10			9.5E-12
PU-239/240			2.3E-10		PU-239/240			2.3E-10			2.6E-12
RA-226			7.8E-10		RA-226			7.8E-10			8.4E-10
RA-228			1.0E-10		RA-228			1.0E-10			1.2E-10
SR-90	3.94E-05	7.8E+01	3.6E-11	2.8E-09	SR-90	3.93E-05	4.1E+01	3.6E-11	1.5E-09	4.3E-09	4.3E-09
TH-228			5.5E-11		TH-228			5.5E-11			7.8E-11
TH-230			1.3E-11		TH-230			1.3E-11			2.0E-11
TH-232			1.7E-10		TH-232			1.7E-10			2.1E-10
U-234	1.18E-01	2.3E+05	1.6E-11	3.7E-06	U-234	1.18E-01	1.2E+05	1.6E-11	2.0E-06	5.7E-06	5.7E-06
U-235/236	6.27E-03	1.2E+04	1.6E-11	2.0E-07	U-235/236	6.27E-03	6.5E+03	1.6E-11	1.0E-07	3.0E-07	3.0E-07
U-238	1.30E-01	2.6E+05	2.8E-11	7.2E-06	U-238	1.30E-01	1.4E+05	2.8E-11	3.8E-06	1.1E-05	1.1E-05
TC-99	5.12E-03	1.0E+04	1.3E-12	1.3E-08	TC-99	5.12E-03	5.3E+03	1.3E-12	6.9E-09	2.0E-08	2.0E-08
		Total Pathway:		1.1E-05			Total Pathway:		5.9E-06		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			2.1E-08
Beryllium			4.3E+00		Beryllium			4.3E+00			3.1E-09
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			4.7E-09
Lead	1.09E-16	1.2E-19			Lead	1.09E-16	6.3E-20				
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate					Tributyl phosphate						
U-TOTAL	4.63E-01	5.1E-04			U-TOTAL	4.63E-01	2.7E-04				
		Total Pathway:					Total Pathway:				
		Total Rad + Chem		1.1E-05			Total Rad + Chem		5.9E-06	*Total:* 1.7E-05	1.7E-05

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TABLE B.3.3-13(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
NP-237	1.4E-06	2.7E+00			NP-237	1.39E-06	1.5E+00				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	3.9E-05	7.8E+01			SR-90	3.93E-05	4.1E+01				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	1.2E-01	2.3E+05			U-234	1.18E-01	1.2E+05				
U-235/236	6.3E-03	1.2E+04			U-235/236	6.27E-03	6.5E+03				
U-238	1.3E-01	2.6E+05			U-238	1.30E-01	1.4E+05				
TC-99	5.1E-03	1.0E+04			TC-99	5.12E-03	5.3E+03				
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Arsenic			3.0E-04		Arsenic			3.0E-04			4.1E-05
Beryllium			5.0E-03		Beryllium			5.0E-03			1.4E-07
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Lead	1.1E-16	1.2E-19			Lead	1.09E-16	6.3E-20				
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate			5.0E-03		Tributyl phosphate			5.0E-03			
U-TOTAL	4.6E-01	5.1E-04	3.0E-03	1.7E-01	U-TOTAL	4.63E-01	2.7E-04	3.0E-03	9.0E-02	2.6E-01	2.6E-01
		Total Pathway:		1.7E-01			Total Pathway:		9.0E-02		
		Total Rad + Chem		1.7E-01			Total Rad + Chem		9.0E-02	*Total:* 2.6E-01	2.6E-01

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TABLE B.3.3-13(b)

FUTURE OFF-PROPERTY CHILD (Federal Ownership)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	2.38E-08	2.0E-03	2.2E-10	4.4E-13	NP-237	2.38E-08	3.1E-03	2.2E-10	6.7E-13	1.1E-12
PU-238	1.43E-08	1.2E-03	2.2E-10	2.6E-13	PU-238	1.43E-08	1.8E-03	2.2E-10	4.0E-13	6.7E-13
PU-239/240	3.70E-09	3.1E-04	2.3E-10	7.2E-14	PU-239/240	3.70E-09	4.8E-04	2.3E-10	1.1E-13	1.8E-13
RA-226	3.58E-07	3.0E-02	7.8E-10	2.3E-11	RA-226	3.58E-07	4.6E-02	7.8E-10	3.6E-11	5.9E-11
RA-228	3.96E-07	3.3E-02	1.0E-10	3.3E-12	RA-228	3.92E-07	5.0E-02	1.0E-10	5.0E-12	8.4E-12
SR-90	4.67E-07	3.9E-02	3.6E-11	1.4E-12	SR-90	4.66E-07	6.0E-02	3.6E-11	2.2E-12	3.6E-12
TH-228	4.77E-07	4.0E-02	5.5E-11	2.2E-12	TH-228	4.64E-07	6.0E-02	5.5E-11	3.3E-12	5.5E-12
TH-230	4.98E-07	4.2E-02	1.3E-11	5.4E-13	TH-230	4.98E-07	6.4E-02	1.3E-11	8.3E-13	1.4E-12
TH-232	4.19E-07	3.5E-02	1.7E-10	6.0E-12	TH-232	4.19E-07	5.4E-02	1.7E-10	9.2E-12	1.5E-11
U-234	1.52E-06	1.3E-01	1.6E-11	2.0E-12	U-234	1.52E-06	2.0E-01	1.6E-11	3.1E-12	5.2E-12
U-235/236	1.04E-07	8.7E-03	1.6E-11	1.4E-13	U-235/236	1.04E-07	1.3E-02	1.6E-11	2.1E-13	3.5E-13
U-238	1.56E-06	1.3E-01	2.8E-11	3.7E-12	U-238	1.56E-06	2.0E-01	2.8E-11	5.6E-12	9.3E-12
			Total Pathway:	4.4E-11				Total Pathway:	6.7E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	7.23E-06	1.6E-09	1.8E+00	2.8E-09	Arsenic	7.23E-06	2.4E-09	1.8E+00	4.2E-09	7.0E-09
Beryllium	4.29E-07	9.4E-11	4.3E+00	4.0E-10	Beryllium	4.29E-07	1.4E-10	4.3E+00	6.2E-10	1.0E-09
Dibenzo(a,h)anthracene	3.87E-07	8.5E-11	7.3E+00	6.2E-10	Dibenzo(a,h)anthracene	3.85E-07	1.3E-10	7.3E+00	9.4E-10	1.6E-09
Lead	4.49E-06	9.8E-10			Lead	4.49E-06	1.5E-09			
TH-TOTAL	3.76E-06	8.3E-10			TH-TOTAL	3.76E-06	1.3E-09			
2-Methylnaphthalene	9.65E-08	2.1E-11			2-Methylnaphthalene	9.65E-08	3.2E-11			
			Total Pathway:	3.8E-09				Total Pathway:	5.8E-09	
			Total Rad + Chem	3.8E-09				Total Rad + Chem	5.9E-09	*Total:* 9.7E-09

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TABLE B.3.3-13(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.4E-08	2.0E-03		
PU-238	1.4E-08	1.2E-03		
PU-239/240	3.7E-09	3.1E-04		
RA-226	3.6E-07	3.0E-02		
RA-228	4.0E-07	3.3E-02		
SR-90	4.7E-07	3.9E-02		
TH-228	4.8E-07	4.0E-02		
TH-230	5.0E-07	4.2E-02		
TH-232	4.2E-07	3.5E-02		
U-234	1.5E-06	1.3E-01		
U-235/236	1.0E-07	8.7E-03		
U-238	1.6E-06	1.3E-01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.38E-08	3.1E-03		
PU-238	1.43E-08	1.8E-03		
PU-239/240	3.70E-09	4.8E-04		
RA-226	3.58E-07	4.6E-02		
RA-228	3.92E-07	5.0E-02		
SR-90	4.66E-07	6.0E-02		
TH-228	4.64E-07	6.0E-02		
TH-230	4.98E-07	6.4E-02		
TH-232	4.19E-07	5.4E-02		
U-234	1.52E-06	2.0E-01		
U-235/236	1.04E-07	1.3E-02		
U-238	1.56E-06	2.0E-01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.2E-06	1.8E-08	3.0E-04	6.2E-05
Beryllium	4.3E-07	1.1E-09	5.0E-03	2.2E-07
Dibenzo(a,h)anthracene	3.9E-07	9.9E-10		
Lead	4.5E-06	1.1E-08		
TH-TOTAL	3.8E-06	9.6E-09		
2-Methylnaphthalene	9.6E-08	2.5E-10		

Total Pathway: 6.2E-05

Total Rad + Chem 6.2E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.23E-06	2.8E-08	3.0E-04	9.4E-05
Beryllium	4.29E-07	1.7E-09	5.0E-03	3.4E-07
Dibenzo(a,h)anthracene	3.85E-07	1.5E-09		
Lead	4.49E-06	1.8E-08		
TH-TOTAL	3.76E-06	1.5E-08		
2-Methylnaphthalene	9.65E-08	3.8E-10		

Total Pathway: 9.5E-05

Total Rad + Chem 9.5E-05

Total	
	1.6E-04
	5.6E-07
Total:	1.6E-04

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TABLE B.3.3-13(b)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.39E-06	1.2E-01	2.2E-10	2.6E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	3.94E-05	3.3E+00	3.6E-11	1.2E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	9.9E+03	1.6E-11	1.6E-07
U-235/236	6.27E-03	5.3E+02	1.6E-11	8.4E-09
U-238	1.30E-01	1.1E+04	2.8E-11	3.1E-07
TC-99	5.12E-03	4.3E+02	1.3E-12	5.6E-10

Total Pathway: 4.7E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk
NP-237	1.39E-06	1.8E-01	2.2E-10	3.9E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	3.93E-05	5.1E+00	3.6E-11	1.8E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	1.5E+04	1.6E-11	2.4E-07
U-235/236	6.27E-03	8.1E+02	1.6E-11	1.3E-08
U-238	1.30E-01	1.7E+04	2.8E-11	4.7E-07
TC-99	5.12E-03	6.6E+02	1.3E-12	8.6E-10

Total Pathway: 7.2E-07

	Total	Total Dust & Groundwater Affected
NP-237	6.5E-11	6.6E-11
PU-238		6.7E-13
PU-239/240		1.8E-13
RA-226		5.9E-11
RA-228		8.4E-12
SR-90	3.0E-10	3.0E-10
TH-228		5.5E-12
TH-230		1.4E-12
TH-232		1.5E-11
U-234	4.0E-07	4.0E-07
U-235/236	2.1E-08	2.1E-08
U-238	7.7E-07	7.7E-07
TC-99	1.4E-09	1.4E-09

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	1.09E-16	2.4E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	1.0E-04		

Total Pathway:

Total Rad + Chem 4.7E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	1.09E-16	3.6E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	1.6E-04		

Total Pathway:

Total Rad + Chem 7.2E-07

		7.0E-09
		1.0E-09
		1.6E-09
Total:	1.2E-06	1.2E-06

TABLE B.3.3-13(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.4E-06	1.2E-01		
PU-238				
PU-239/240				
RA-226				
SR-90	3.9E-05	3.3E+00		
TH-228				
TH-230				
TH-232				
U-234	1.2E-01	9.9E+03		
U-235/236	6.3E-03	5.3E+02		
U-238	1.3E-01	1.1E+04		
TC-99	5.1E-03	4.3E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.39E-06	1.8E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.93E-05	5.1E+00		
TH-228				
TH-230				
TH-232				
U-234	1.18E-01	1.5E+04		
U-235/236	6.27E-03	8.1E+02		
U-238	1.30E-01	1.7E+04		
TC-99	5.12E-03	6.6E+02		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.1E-16	2.8E-19		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.6E-01	1.2E-03	5.0E-03	2.4E-01

Total Pathway: 2.4E-01

Total Rad + Chem 2.4E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.09E-16	4.2E-19		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	1.8E-03	5.0E-03	9.1E-06

Total Pathway: 9.1E-06

Total Rad + Chem 9.1E-06

	Total	Total Dust & Groundwater Affected
		1.6E-04
		5.6E-07
	2.4E-01	2.4E-01
Total:	2.4E-01	2.4E-01

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FEMP-OU02-6 FINAL
January 21, 1995

TABLE B.3.3-13(c)

FUTURE OFF-PROPERTY FARMER (Private Ownership)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	2.38E-08	4.7E-02	2.2E-10	1.0E-11	NP-237	2.38E-08	2.5E-02	2.2E-10	5.5E-12	1.6E-11
PU-238	1.43E-08	2.8E-02	2.2E-10	6.2E-12	PU-238	1.43E-08	1.5E-02	2.2E-10	3.3E-12	9.5E-12
PU-239/240	3.70E-09	7.3E-03	2.3E-10	1.7E-12	PU-239/240	3.70E-09	3.9E-03	2.3E-10	8.9E-13	2.6E-12
RA-226	3.58E-07	7.1E-01	7.8E-10	5.5E-10	RA-226	3.58E-07	3.7E-01	7.8E-10	2.9E-10	8.4E-10
RA-228	3.96E-07	7.8E-01	1.0E-10	7.8E-11	RA-228	3.92E-07	4.1E-01	1.0E-10	4.1E-11	1.2E-10
SR-90	4.67E-07	9.2E-01	3.6E-11	3.3E-11	SR-90	4.66E-07	4.9E-01	3.6E-11	1.8E-11	5.1E-11
TH-228	4.77E-07	9.4E-01	5.5E-11	5.2E-11	TH-228	4.64E-07	4.8E-01	5.5E-11	2.7E-11	7.8E-11
TH-230	4.98E-07	9.8E-01	1.3E-11	1.3E-11	TH-230	4.98E-07	5.2E-01	1.3E-11	6.8E-12	2.0E-11
TH-232	4.19E-07	8.3E-01	1.7E-10	1.4E-10	TH-232	4.19E-07	4.4E-01	1.7E-10	7.4E-11	2.1E-10
U-234	1.52E-06	3.0E+00	1.6E-11	4.8E-11	U-234	1.52E-06	1.6E+00	1.6E-11	2.5E-11	7.3E-11
U-235/236	1.04E-07	2.0E-01	1.6E-11	3.3E-12	U-235/236	1.04E-07	1.1E-01	1.6E-11	1.7E-12	5.0E-12
U-238	1.56E-06	3.1E+00	2.8E-11	8.6E-11	U-238	1.56E-06	1.6E+00	2.8E-11	4.6E-11	1.3E-10
			Total Pathway:	1.0E-09				Total Pathway:	5.4E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	7.23E-06	8.0E-09	1.8E+00	1.4E-08	Arsenic	7.23E-06	4.2E-09	1.8E+00	7.4E-09	2.1E-08
Beryllium	4.29E-07	4.7E-10	4.3E+00	2.0E-09	Beryllium	4.29E-07	2.5E-10	4.3E+00	1.1E-09	3.1E-09
Dibenzo(a,h)anthracene	3.87E-07	4.3E-10	7.3E+00	3.1E-09	Dibenzo(a,h)anthracene	3.85E-07	2.2E-10	7.3E+00	1.6E-09	4.7E-09
Lead	4.49E-06	4.9E-09			Lead	4.49E-06	2.6E-09			
TH-TOTAL	3.76E-06	4.1E-09			TH-TOTAL	3.76E-06	2.2E-09			
2-Methylnaphthalene	9.65E-08	1.1E-10			2-Methylnaphthalene	9.65E-08	5.6E-11			
			Total Pathway:	1.9E-08				Total Pathway:	1.0E-08	
			Total Rad + Chem	2.0E-08				Total Rad + Chem	1.1E-08	*Total:* 3.1E-08

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TABLE B.3.3-13(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.4E-08	4.7E-02		
PU-238	1.4E-08	2.8E-02		
PU-239/240	3.7E-09	7.3E-03		
RA-226	3.6E-07	7.1E-01		
RA-228	4.0E-07	7.8E-01		
SR-90	4.7E-07	9.2E-01		
TH-228	4.8E-07	9.4E-01		
TH-230	5.0E-07	9.8E-01		
TH-232	4.2E-07	8.3E-01		
U-234	1.5E-06	3.0E+00		
U-235/236	1.0E-07	2.0E-01		
U-238	1.6E-06	3.1E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.38E-08	2.5E-02		
PU-238	1.43E-08	1.5E-02		
PU-239/240	3.70E-09	3.9E-03		
RA-226	3.58E-07	3.7E-01		
RA-228	3.92E-07	4.1E-01		
SR-90	4.66E-07	4.9E-01		
TH-228	4.64E-07	4.8E-01		
TH-230	4.98E-07	5.2E-01		
TH-232	4.19E-07	4.4E-01		
U-234	1.52E-06	1.6E+00		
U-235/236	1.04E-07	1.1E-01		
U-238	1.56E-06	1.6E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.2E-06	8.0E-09	3.0E-04	2.7E-05
Beryllium	4.3E-07	4.7E-10	5.0E-03	9.5E-08
Dibenzo(a,h)anthracene	3.9E-07	4.3E-10		
Lead	4.5E-06	4.9E-09		
TH-TOTAL	3.8E-06	4.1E-09		
2-Methylnaphthalene	9.6E-08	1.1E-10		

Total Pathway: 2.7E-05

Total Rad + Chem 2.7E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	7.23E-06	4.2E-09	3.0E-04	1.4E-05
Beryllium	4.29E-07	2.5E-10	5.0E-03	5.0E-08
Dibenzo(a,h)anthracene	3.85E-07	2.2E-10		
Lead	4.49E-06	2.6E-09		
TH-TOTAL	3.76E-06	2.2E-09		
2-Methylnaphthalene	9.65E-08	5.6E-11		

Total Pathway: 1.4E-05

Total Rad + Chem 1.4E-05

4.1E-05

1.4E-07

Total: 4.1E-05

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TABLE B.3.3-13(c)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.39E-06	2.7E+00	2.2E-10	6.0E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	3.94E-05	7.8E+01	3.6E-11	2.8E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	2.3E+05	1.6E-11	3.7E-06
U-235/236	6.27E-03	1.2E+04	1.6E-11	2.0E-07
U-238	1.30E-01	2.6E+05	2.8E-11	7.2E-06
TC-99	5.12E-03	1.0E+04	1.3E-12	1.3E-08

Total Pathway: 1.1E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk
NP-237	1.39E-06	1.5E+00	2.2E-10	3.2E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	3.93E-05	4.1E+01	3.6E-11	1.5E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	1.2E+05	1.6E-11	2.0E-06
U-235/236	6.27E-03	6.5E+03	1.6E-11	1.0E-07
U-238	1.30E-01	1.4E+05	2.8E-11	3.8E-06
TC-99	5.12E-03	5.3E+03	1.3E-12	6.9E-09

Total Pathway: 5.9E-06

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	1.09E-16	1.2E-19		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	5.1E-04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	1.09E-16	6.3E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	2.7E-04		

Total Pathway:

Total Rad + Chem 1.1E-05

Total Rad + Chem 5.9E-06

	Total	Total Dust & Groundwater Affected
	9.2E-10	9.4E-10
		9.5E-12
		2.6E-12
		8.4E-10
		1.2E-10
	4.3E-09	4.3E-09
		7.8E-11
		2.0E-11
		2.1E-10
	5.7E-06	5.7E-06
	3.0E-07	3.0E-07
	1.1E-05	1.1E-05
	2.0E-08	2.0E-08
		2.1E-08
		3.1E-09
		4.7E-09
Total:	1.7E-05	1.7E-05

TABLE B.3.3-13(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.4E-06	2.7E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.9E-05	7.8E+01		
TH-228				
TH-230				
TH-232				
U-234	1.2E-01	2.3E+05		
U-235/236	6.3E-03	1.2E+04		
U-238	1.3E-01	2.6E+05		
TC-99	5.1E-03	1.0E+04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.39E-06	1.5E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.93E-05	4.1E+01		
TH-228				
TH-230				
TH-232				
U-234	1.18E-01	1.2E+05		
U-235/236	6.27E-03	6.5E+03		
U-238	1.30E-01	1.4E+05		
TC-99	5.12E-03	5.3E+03		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.1E-16	1.2E-19		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-TOTAL	4.6E-01	5.1E-04	3.0E-03	1.7E-01

Total Pathway: 1.7E-01

Total Rad + Chem 1.7E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.09E-16	6.3E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-TOTAL	4.63E-01	2.7E-04	3.0E-03	9.0E-02

Total Pathway: 9.0E-02

Total Rad + Chem 9.0E-02

	Total	Total Dust & Groundwater Affected
		4.1E-05
		1:4E-07
	2.6E-01	2.6E-01
Total:	2.6E-01	2.6E-01

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TABLE B.3.3-13(d)

FUTURE OFF-PROPERTY CHILD (Private Ownership)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	2.38E-08	2.0E-03	2.2E-10	4.4E-13	NP-237	2.38E-08	3.1E-03	2.2E-10	6.7E-13	1.1E-12
PU-238	1.43E-08	1.2E-03	2.2E-10	2.6E-13	PU-238	1.43E-08	1.8E-03	2.2E-10	4.0E-13	6.7E-13
PU-239/240	3.70E-09	3.1E-04	2.3E-10	7.2E-14	PU-239/240	3.70E-09	4.8E-04	2.3E-10	1.1E-13	1.8E-13
RA-226	3.58E-07	3.0E-02	7.8E-10	2.3E-11	RA-226	3.58E-07	4.6E-02	7.8E-10	3.6E-11	5.9E-11
RA-228	3.96E-07	3.3E-02	1.0E-10	3.3E-12	RA-228	3.92E-07	5.0E-02	1.0E-10	5.0E-12	8.4E-12
SR-90	4.67E-07	3.9E-02	3.6E-11	1.4E-12	SR-90	4.66E-07	6.0E-02	3.6E-11	2.2E-12	3.6E-12
TH-228	4.77E-07	4.0E-02	5.5E-11	2.2E-12	TH-228	4.64E-07	6.0E-02	5.5E-11	3.3E-12	5.5E-12
TH-230	4.98E-07	4.2E-02	1.3E-11	5.4E-13	TH-230	4.98E-07	6.4E-02	1.3E-11	8.3E-13	1.4E-12
TH-232	4.19E-07	3.5E-02	1.7E-10	6.0E-12	TH-232	4.19E-07	5.4E-02	1.7E-10	9.2E-12	1.5E-11
U-234	1.52E-06	1.3E-01	1.6E-11	2.0E-12	U-234	1.52E-06	2.0E-01	1.6E-11	3.1E-12	5.2E-12
U-235/236	1.04E-07	8.7E-03	1.6E-11	1.4E-13	U-235/236	1.04E-07	1.3E-02	1.6E-11	2.1E-13	3.5E-13
U-238	1.56E-06	1.3E-01	2.8E-11	3.7E-12	U-238	1.56E-06	2.0E-01	2.8E-11	5.6E-12	9.3E-12
			Total Pathway:	4.4E-11				Total Pathway:	6.7E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	7.23E-06	1.6E-09	1.8E+00	2.8E-09	Arsenic	7.23E-06	2.4E-09	1.8E+00	4.2E-09	7.0E-09
Beryllium	4.29E-07	9.4E-11	4.3E+00	4.0E-10	Beryllium	4.29E-07	1.4E-10	4.3E+00	6.2E-10	1.0E-09
Dibenzo(a,h)anthracene	3.87E-07	8.5E-11	7.3E+00	6.2E-10	Dibenzo(a,h)anthracene	3.85E-07	1.3E-10	7.3E+00	9.4E-10	1.6E-09
Lead	4.49E-06	9.8E-10			Lead	4.49E-06	1.5E-09			
TH-TOTAL	3.76E-06	8.3E-10			TH-TOTAL	3.76E-06	1.3E-09			
2-Methylnaphthalene	9.65E-08	2.1E-11			2-Methylnaphthalene	9.65E-08	3.2E-11			
			Total Pathway:	3.8E-09				Total Pathway:	5.8E-09	
			Total Rad + Chem	3.8E-09				Total Rad + Chem	5.9E-09	*Total:* 9.7E-09

TABLE B.3.3-13(d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237	2.4E-08	2.0E-03			NP-237	2.38E-08	3.1E-03			
PU-238	1.4E-08	1.2E-03			PU-238	1.43E-08	1.8E-03			
PU-239/240	3.7E-09	3.1E-04			PU-239/240	3.70E-09	4.8E-04			
RA-226	3.6E-07	3.0E-02			RA-226	3.58E-07	4.6E-02			
RA-228	4.0E-07	3.3E-02			RA-228	3.92E-07	5.0E-02			
SR-90	4.7E-07	3.9E-02			SR-90	4.66E-07	6.0E-02			
TH-228	4.8E-07	4.0E-02			TH-228	4.64E-07	6.0E-02			
TH-230	5.0E-07	4.2E-02			TH-230	4.98E-07	6.4E-02			
TH-232	4.2E-07	3.5E-02			TH-232	4.19E-07	5.4E-02			
U-234	1.5E-06	1.3E-01			U-234	1.52E-06	2.0E-01			
U-235/236	1.0E-07	8.7E-03			U-235/236	1.04E-07	1.3E-02			
U-238	1.6E-06	1.3E-01			U-238	1.56E-06	2.0E-01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	7.2E-06	1.8E-08	3.0E-04	6.2E-05	Arsenic	7.23E-06	2.8E-08	3.0E-04	9.4E-05	1.6E-04
Beryllium	4.3E-07	1.1E-09	5.0E-03	2.2E-07	Beryllium	4.29E-07	1.7E-09	5.0E-03	3.4E-07	5.6E-07
Dibenzo(a,h)anthracene	3.9E-07	9.9E-10			Dibenzo(a,h)anthracene	3.85E-07	1.5E-09			
Lead	4.5E-06	1.1E-08			Lead	4.49E-06	1.8E-08			
TH-TOTAL	3.8E-06	9.6E-09			TH-TOTAL	3.76E-06	1.5E-08			
2-Methylnaphthalene	9.6E-08	2.5E-10			2-Methylnaphthalene	9.65E-08	3.8E-10			
			Total Pathway:	6.2E-05				Total Pathway:	9.5E-05	
			Total Rad + Chem	6.2E-05				Total Rad + Chem	9.5E-05	*Total:* 1.6E-04

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TABLE B.3.3-13(d)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.39E-06	1.2E-01	2.2E-10	2.6E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	3.94E-05	3.3E+00	3.6E-11	1.2E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	9.9E+03	1.6E-11	1.6E-07
U-235/236	6.27E-03	5.3E+02	1.6E-11	8.4E-09
U-238	1.30E-01	1.1E+04	2.8E-11	3.1E-07
TC-99	5.12E-03	4.3E+02	1.3E-12	5.6E-10

Total Pathway: 4.7E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk
NP-237	1.39E-06	1.8E-01	2.2E-10	3.9E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	3.93E-05	5.1E+00	3.6E-11	1.8E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.18E-01	1.5E+04	1.6E-11	2.4E-07
U-235/236	6.27E-03	8.1E+02	1.6E-11	1.3E-08
U-238	1.30E-01	1.7E+04	2.8E-11	4.7E-07
TC-99	5.12E-03	6.6E+02	1.3E-12	8.6E-10

Total Pathway: 7.2E-07

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	1.09E-16	2.4E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	1.0E-04		

Total Pathway:

Total Rad + Chem 4.7E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	1.09E-16	3.6E-20		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	1.6E-04		

Total Pathway:

Total Rad + Chem 7.2E-07

	Total	Total Dust & Groundwater Affected
	6.5E-11	6.6E-11
		6.7E-13
		1.8E-13
		5.9E-11
		8.4E-12
	3.0E-10	3.0E-10
		5.5E-12
		1.4E-12
		1.5E-11
	4.0E-07	4.0E-07
	2.1E-08	2.1E-08
	7.7E-07	7.7E-07
	1.4E-09	1.4E-09
		7.0E-09
		1.0E-09
		1.6E-09
Total:	1.2E-06	1.2E-06

TABLE B.3.3-13(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.4E-06	1.2E-01		
PU-238				
PU-239/240				
RA-226				
SR-90	3.9E-05	3.3E+00		
TH-228				
TH-230				
TH-232				
U-234	1.2E-01	9.9E+03		
U-235/236	6.3E-03	5.3E+02		
U-238	1.3E-01	1.1E+04		
TC-99	5.1E-03	4.3E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.39E-06	1.8E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.93E-05	5.1E+00		
TH-228				
TH-230				
TH-232				
U-234	1.18E-01	1.5E+04		
U-235/236	6.27E-03	8.1E+02		
U-238	1.30E-01	1.7E+04		
TC-99	5.12E-03	6.6E+02		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.1E-16	2.8E-19		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.6E-01	1.2E-03	5.0E-03	2.4E-01

Total Pathway: 2.4E-01

Total Rad + Chem 2.4E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.09E-16	4.2E-19		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	4.63E-01	1.8E-03	5.0E-03	9.1E-06

Total Pathway: 9.1E-06

Total Rad + Chem 9.1E-06

	Total	Total Dust & Groundwater Affected
		1.6E-04
		5.6E-07
	2.4E-01	2.4E-01
Total:	2.4E-01	2.4E-01

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TABLE B.3.3-14(a)
FUTURE, OFF-PROPERTY FARMER (Federal Ownership)
INACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	1.4E+01	2.2E-10	3.0E-09
SR-90	2.3E-03	1.1E+02	3.6E-11	4.0E-09
TC-99	9.8E-01	4.8E+04	1.3E-12	6.2E-08
U-234	2.4E+01	1.2E+06	1.6E-11	1.9E-05
U-235/236	1.3E+00	6.3E+04	1.6E-11	1.0E-06
U-238	2.7E+01	1.3E+06	2.8E-11	3.6E-05

Total Pathway: 5.6E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Lead	2.1E-17	5.6E-19		
U-TOTAL	9.5E-02	2.6E-03		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Lead	2.1E-18		
U-TOTAL	9.7E-03		

Total Pathway:

Total Rad + Chem 5.6E-05

Total Rad + Chem

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TABLE B.3.3-14(a)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	3.0E-09
	4.0E-09
	6.2E-08
	1.9E-05
	1.0E-06
	3.6E-05
Total Pathway:	

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
Lead	6.5E-24		
U-TOTAL	7.4E-06		
Total Pathway:			

Total Rad + Chem *Total:* 5.6E-05

TABLE B.3.3-14(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	2.8E-04	1.4E+01			Not applicable
SR-90	2.3E-03	1.1E+02			
TC-99	9.8E-01	4.8E+04			
U-234	2.4E+01	1.2E+06			
U-235/236	1.3E+00	6.3E+04			
U-238	2.7E+01	1.3E+06			
		Total Pathway:			Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Lead	2.1E-17	5.6E-19			Lead	2.1E-18		
U-TOTAL	9.5E-02	2.6E-03	3.0E-03	8.6E-01	U-TOTAL	9.7E-03		
		Total Pathway:		8.6E-01			Total Pathway:	
		Total Rad + Chem		8.6E-01			Total Rad + Chem	

TABLE B.3.3-14(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Lead	6.5E-24			
U-TOTAL	7.4E-06	1.5E-04	5.0E-02	9.1E-01
Total Pathway:			5.0E-02	

Total Rad + Chem	5.0E-02	*Total:*	9.1E-01

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TABLE B.3.3-14(b)
FUTURE, OFF-PROPERTY CHILD (Federal Ownership)
INACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	5.9E-01	2.2E-10	1.3E-10
SR-90	2.3E-03	4.7E+00	3.6E-11	1.7E-10
TC-99	9.8E-01	2.1E+03	1.3E-12	2.7E-09
U-234	2.4E+01	5.0E+04	1.6E-11	8.1E-07
U-235/236	1.3E+00	2.7E+03	1.6E-11	4.3E-08
U-238	2.7E+01	5.6E+04	2.8E-11	1.6E-06

Total Pathway: 2.4E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Lead	2.1E-17	1.1E-19		
U-TOTAL	9.5E-02	5.2E-04		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Lead	8.4E-19		
U-TOTAL	3.9E-03		

Total Pathway:

Total Rad + Chem 2.4E-06

Total Rad + Chem

TABLE B.3.3-14(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	1.3E-10
	1.7E-10
	2.7E-09
	8.1E-07
	4.3E-08
	1.6E-06
Total Pathway:	

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
Lead	9.0E-25		
U-TOTAL	1.0E-06		
Total Pathway:			

Total Rad + Chem	*Total:* 2.4E-06

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TABLE B.3.3-14(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.8E-04	5.9E-01		
SR-90	2.3E-03	4.7E+00		
TC-99	9.8E-01	2.1E+03		
U-234	2.4E+01	5.0E+04		
U-235/236	1.3E+00	2.7E+03		
U-238	2.7E+01	5.6E+04		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Lead	2.1E-17	1.3E-18		
U-TOTAL	9.5E-02	6.0E-03	3.0E-03	2.0E+00

Total Pathway: 2.0E+00

Total Rad + Chem 2.0E+00

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
Lead	9.8E-18		
U-TOTAL	4.5E-02		

Total Pathway:

Total Rad + Chem

TABLE B.3.3-14(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
			Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Lead	1.0E-23			
U-TOTAL	1.2E-05	1.5E-04	8.1E-02	2.1E+00
			Total Pathway:	8.1E-02

Total Rad + Chem	8.1E-02	*Total:*	2.1E+00

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TABLE B.3.3-14(c)
FUTURE, OFF-PROPERTY FARMER (Private Ownership)
INACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	1.4E+01	2.2E-10	3.0E-09
SR-90	2.3E-03	1.1E+02	3.6E-11	4.0E-09
TC-99	9.8E-01	4.8E+04	1.3E-12	6.2E-08
U-234	2.4E+01	1.2E+06	1.6E-11	1.9E-05
U-235/236	1.3E+00	6.3E+04	1.6E-11	1.0E-06
U-238	2.7E+01	1.3E+06	2.8E-11	3.6E-05

Total Pathway: 5.6E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Lead	2.1E-17	5.6E-19		
U-TOTAL	9.5E-02	2.6E-03		

Total Pathway:

Total Rad + Chem 5.6E-05

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Lead	2.1E-18		
U-TOTAL	9.7E-03		

Total Pathway:

Total Rad + Chem

TABLE B.3.3-14(c)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	3.0E-09
	4.0E-09
	6.2E-08
	1.9E-05
	1.0E-06
	3.6E-05

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
Lead	6.5E-24		
U-TOTAL	7.4E-06		

Total Pathway:

Total Rad + Chem *Total:* 5.6E-05

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TABLE B.3.3-14(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.8E-04	1.4E+01		
SR-90	2.3E-03	1.1E+02		
TC-99	9.8E-01	4.8E+04		
U-234	2.4E+01	1.2E+06		
U-235/236	1.3E+00	6.3E+04		
U-238	2.7E+01	1.3E+06		

Total Pathway:

Inhalation/Groundwater
Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Lead	2.1E-17	5.6E-19		
U-TOTAL	9.5E-02	2.6E-03	3.0E-03	8.6E-01

Total Pathway: 8.6E-01

Total Rad + Chem 8.6E-01

Inhalation/Groundwater			
Compound	Intake	RfD(i)	Hazard
Lead	2.1E-18		
U-TOTAL	9.7E-03		

Total Pathway:

Total Rad + Chem

TABLE B.3.3-14(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard		
Dermal Contact/Groundwater		**Total**
Not applicable		
Total Pathway:		

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Lead	6.5E-24			
U-TOTAL	7.4E-06	1.5E-04	5.0E-02	9.1E-01
Total Pathway:			5.0E-02	

Total Rad + Chem	5.0E-02	*Total:*	9.1E-01

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TABLE B.3.3-14(d)
FUTURE, OFF-PROPERTY CHILD (Private Ownership)
INACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	2.8E-04	5.9E-01	2.2E-10	1.3E-10
SR-90	2.3E-03	4.7E+00	3.6E-11	1.7E-10
TC-99	9.8E-01	2.1E+03	1.3E-12	2.7E-09
U-234	2.4E+01	5.0E+04	1.6E-11	8.1E-07
U-235/236	1.3E+00	2.7E+03	1.6E-11	4.3E-08
U-238	2.7E+01	5.6E+04	2.8E-11	1.6E-06

Total Pathway: 2.4E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Lead	2.1E-17	1.1E-19		
U-TOTAL	9.5E-02	5.2E-04		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Lead	8.4E-19		
U-TOTAL	3.9E-03		

Total Pathway:

Total Rad + Chem 2.4E-06

Total Rad + Chem

TABLE B.3.3-14(d)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	1.3E-10
	1.7E-10
	2.7E-09
	8.1E-07
	4.3E-08
	1.6E-06

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
Lead	9.0E-25		
U-TOTAL	1.0E-06		

Total Pathway:

Total Rad + Chem *Total:* 2.4E-06

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TABLE B.3.3-14(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	2.8E-04	5.9E-01			Not applicable
SR-90	2.3E-03	4.7E+00			
TC-99	9.8E-01	2.1E+03			
U-234	2.4E+01	5.0E+04			
U-235/236	1.3E+00	2.7E+03			
U-238	2.7E+01	5.6E+04			
Total Pathway:					Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Lead	2.1E-17	1.3E-18			Lead	9.8E-18		
U-TOTAL	9.5E-02	6.0E-03	3.0E-03	2.0E+00	U-TOTAL	4.5E-02		
		Total Pathway:		2.0E+00		Total Pathway:		
		Total Rad + Chem		2.0E+00		Total Rad + Chem		

TABLE B.3.3-14(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard		
Dermal Contact/Groundwater		**Total**
Not applicable		
Total Pathway:		

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Lead	1.0E-23			
U-TOTAL	1.2E-05	1.5E-04	8.1E-02	2.1E+00
Total Pathway:			8.1E-02	

Total Rad + Chem 8.1E-02 *Total:* 2.1E+00

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TABLE B.3.3-15
FUTURE, EXPANDED TRESPASSER
INACTIVE FLYASH PILE: SURFACE SOIL

Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	6.08E-07	2.0E-03	2.9E-08	5.7E-11
PU-238	3.60E-07	1.2E-03	3.9E-08	4.6E-11
PU-239/240	9.32E-08	3.0E-04	3.8E-08	1.2E-11
RA-226	8.79E-06	2.9E-02	7.0E-09	2.0E-10
RA-228	9.95E-06	3.2E-02	6.9E-10	2.2E-11
SR-90	3.86E-06	1.3E-02	6.2E-11	7.8E-13
TH-228	1.20E-05	3.9E-02	7.8E-08	3.0E-09
TH-230	1.23E-05	4.0E-02	2.9E-08	1.2E-09
TH-232	1.03E-05	3.4E-02	1.1E-07	3.7E-09
U-234	3.84E-05	1.2E-01	2.6E-08	3.2E-09
U-235/236	2.67E-06	8.7E-03	2.5E-08	2.2E-10
U-238	3.94E-05	1.3E-01	5.2E-08	6.7E-09
			Total Pathway:	1.8E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.37E-01	4.5E+00	2.2E-10	9.8E-10
PU-238	8.10E-02	2.6E+00	2.2E-10	5.8E-10
PU-239/240	2.10E-02	6.8E-01	2.3E-10	1.6E-10
RA-226	1.98E+00	6.4E+01	7.8E-10	5.0E-08
RA-228	2.24E+00	7.3E+01	1.0E-10	7.3E-09
SR-90	8.70E-01	2.8E+01	3.6E-11	1.0E-09
TH-228	2.71E+00	8.8E+01	5.5E-11	4.8E-09
TH-230	2.77E+00	9.0E+01	1.3E-11	1.2E-09
TH-232	2.33E+00	7.6E+01	1.7E-10	1.3E-08
U-234	8.65E+00	2.8E+02	1.6E-11	4.5E-09
U-235/236	6.02E-01	2.0E+01	1.6E-11	3.1E-10
U-238	8.87E+00	2.9E+02	2.8E-11	8.1E-09
			Total Pathway:	9.2E-08

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/kg)	Intake	SF(i)	Risk
Arsenic	1.47E-07	3.8E-10	1.5E+01	5.7E-09
Beryllium	1.01E-08	2.6E-11	8.4E+00	2.2E-10
Dibenzo(a,h)anthracene	9.77E-09	2.5E-11	6.1E+00	1.5E-10
Lead	1.06E-07	2.7E-10		
TH-TOTAL	9.50E-08	2.5E-10		
2-Methylnaphthalene	7.10E-10	1.8E-12		
			Total Pathway:	6.1E-09
			Total Rad + Chem	2.4E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	3.32E+01	8.0E-07	1.8E+00	1.4E-06
Beryllium	2.27E+00	5.4E-08	4.3E+00	2.3E-07
Dibenzo(a,h)anthracene	2.20E+00	5.3E-08	7.3E+00	3.8E-07
Lead	2.39E+01	5.7E-07		
TH-TOTAL	2.14E+01	5.1E-07		
2-Methylnaphthalene	1.60E-01	3.8E-09		
			Total Pathway:	2.0E-06
			Total Rad + Chem	2.1E-06

TABLE B.3.3-15
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	6.1E-02	4.3E-07	2.6E-08	2.7E-08
	PU-238	3.6E-02	2.8E-11	1.0E-12	6.3E-10
	PU-239/24	9.4E-03	2.7E-11	2.5E-13	1.7E-10
	RA-226	8.9E-01	6.0E-06	5.3E-06	5.4E-06
	RA-228	1.0E+00	2.9E-06	2.9E-06	2.9E-06
	SR-90	3.9E-01			1.0E-09
	TH-228	1.2E+00	5.6E-06	6.8E-06	6.8E-06
	TH-230	1.2E+00	5.4E-11	6.7E-11	2.4E-09
	TH-232	1.0E+00	8.5E-06	8.9E-06	8.9E-06
	U-234	3.9E+00	3.0E-11	1.2E-10	7.9E-09
	U-235/236	2.7E-01	2.4E-07	6.5E-08	6.5E-08
	U-238	4.0E+00	3.6E-08	1.4E-07	1.6E-07
Total Pathway:			Total Pathway:	2.4E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Arsenic	3.0E-07	1.8E+00	5.6E-07					2.0E-06
Beryllium	2.1E-07		2.3E-07					4.7E-07
Dibenzo(a,h)anthracene			3.8E-07		Not applicable			7.7E-07
Lead	2.2E-06							
TH-TOTAL								
2-Methylnaphthalene	4.4E-07							
		Total Pathway:	1.2E-06			Total Pathway:		

Total Rad + Chem 1.2E-06 2.4E-05 *Total:* 2.7E-05

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TABLE B.3.3-15
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3	Intake	RfD(i)	Hazard
NP-237	6.08E-07	2.0E-03		
PU-238	3.60E-07	1.2E-03		
PU-239/240	9.32E-08	3.0E-04		
RA-226	8.79E-06	2.9E-02		
RA-228	9.95E-06	3.2E-02		
SR-90	3.86E-06	1.3E-02		
TH-228	1.20E-05	3.9E-02		
TH-230	1.23E-05	4.0E-02		
TH-232	1.03E-05	3.4E-02		
U-234	3.84E-05	1.2E-01		
U-235/236	2.67E-06	8.7E-03		
U-238	3.94E-05	1.3E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.37E-01	4.5E+00		
PU-238	8.10E-02	2.6E+00		
PU-239/240	2.10E-02	6.8E-01		
RA-226	1.98E+00	6.4E+01		
RA-228	2.24E+00	7.3E+01		
SR-90	8.70E-01	2.8E+01		
TH-228	2.71E+00	8.8E+01		
TH-230	2.77E+00	9.0E+01		
TH-232	2.33E+00	7.6E+01		
U-234	8.65E+00	2.8E+02		
U-235/236	6.02E-01	2.0E+01		
U-238	8.87E+00	2.9E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(i)	Hazard
Arsenic	1.47E-07	6.1E-10		
Beryllium	1.01E-08	4.2E-11		
Dibenzo(a,h)anthracene	9.77E-09	4.0E-11		
Lead	1.06E-07	4.4E-10		
TH-TOTAL	9.50E-08	3.9E-10		
2-Methylnaphthalene	7.10E-10	2.9E-12		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.32E+01	1.3E-06	3.0E-04	4.2E-03
Beryllium	2.27E+00	8.7E-08	5.0E-03	1.7E-05
Dibenzo(a,h)anthracene	2.20E+00	8.4E-08		
Lead	2.39E+01	9.1E-07		
TH-TOTAL	2.14E+01	8.2E-07		
2-Methylnaphthalene	1.60E-01	6.1E-09		

Total Pathway: 4.2E-03

Total Rad + Chem

Total Rad + Chem 4.2E-03

TABLE B.3.3-15
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard	
Not applicable	NP-237	6.1E-02			
	PU-238	3.6E-02			
	PU-239/240	9.4E-03			
	RA-226	8.9E-01			
	RA-228	1.0E+00			
	SR-90	3.9E-01			
	TH-228	1.2E+00			
	TH-230	1.2E+00			
	TH-232	1.0E+00			
	U-234	3.9E+00			
	U-235/236	2.7E-01			
	U-238	4.0E+00			
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Arsenic	4.8E-07	2.9E-04	1.7E-03					5.9E-03
Beryllium	3.3E-07	5.0E-05	6.6E-03					6.6E-03
Dibenzo(a,h)anthracene				Not applicable				
Lead	3.5E-06							
TH-TOTAL								
2-Methylnaphthalene	7.0E-07							
		Total Pathway:	8.3E-03			Total Pathway:		

Total Rad + Chem 8.3E-03

otal: 1.3E-02

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TABLE B.3.3-16
FUTURE, EXPANDED TRESPASSER
INACTIVE FLYASH PILE: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	6.71E-01	1.5E+01	2.2E-10	3.2E-09		3.2E-09
PU-238	8.08E-01	1.8E+01	2.2E-10	3.9E-09	Not applicable	3.9E-09
PU-239/240	5.82E-02	1.3E+00	2.3E-10	2.9E-10		2.9E-10
RA-226	3.60E-01	7.9E+00	7.8E-10	6.1E-09		6.1E-09
RA-228	3.63E-01	7.9E+00	1.0E-10	7.9E-10		7.9E-10
SR-90	1.41E-01	3.1E+00	3.6E-11	1.1E-10		1.1E-10
U-234	1.63E+02	3.6E+03	1.6E-11	5.7E-08		5.7E-08
U-235/236	1.01E+01	2.2E+02	1.6E-11	3.5E-09		3.5E-09
U-238	1.60E+02	3.5E+03	2.8E-11	9.8E-08		9.8E-08
			Total Pathway:	1.7E-07	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	3.23E-03	6.4E-08	1.8E+00	1.1E-07	Arsenic	9.4E-09	1.8E+00	1.7E-08	1.3E-07
Beryllium	1.56E-04	3.1E-09	4.3E+00	1.3E-08	Beryllium	4.5E-10		1.3E-08	2.7E-08
Lead	1.30E-02	2.6E-07			Lead	1.5E-10			
Dibenzo(a,h)anthracene	2.22E-05	4.4E-10	7.3E+00	3.2E-09	Dibenzo(a,h)anthracene	1.7E-07		3.2E-09	6.4E-09
2-Methylnaphthalene	3.15E-03	6.3E-08			2-Methylnaphthalene	1.3E-06			
U-TOTAL	4.96E-01	9.9E-06			U-TOTAL	1.4E-06			
			Total Pathway:	1.3E-07		Total Pathway:		3.4E-08	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	3.0E-07	Total Rad + Chem	3.4E-08	*Total:*	3.4E-07

TABLE B.3.3-16
(continued)
INACTIVE FLYASH PILE: SURFACE WATER
Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	6.71E-01	1.5E+01				
PU-238	8.08E-01	1.8E+01				
PU-239/240	5.82E-02	1.3E+00				
RA-226	3.60E-01	7.9E+00				
RA-228	3.63E-01	7.9E+00				
SR-90	1.41E-01	3.1E+00				
U-234	1.63E+02	3.6E+03				
U-235/236	1.01E+01	2.2E+02				
U-238	1.60E+02	3.5E+03				
					Not applicable	
		Total Pathway:			Total Pathway:	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	3.2E-03	3.7E-07	3.0E-04	1.2E-03	Arsenic	5.5E-08	2.9E-04	1.9E-04	1.4E-03
Beryllium	1.6E-04	1.8E-08	5.0E-03	3.6E-06	Beryllium	2.7E-09	5.0E-05	5.3E-05	5.7E-05
Lead	1.3E-02	1.5E-06			Lead	8.8E-10			
Dibenzo(a,h)anthracene	2.2E-05	2.6E-09			Dibenzo(a,h)anthracene	1.0E-06			
2-Methylnaphthalene	3.2E-03	3.7E-07			2-Methylnaphthalene	7.6E-06			
U-TOTAL	5.0E-01	5.8E-05	3.0E-03	1.9E-02	U-TOTAL	8.4E-06	1.5E-04	5.6E-02	7.5E-02
		Total Pathway:		2.0E-02		Total Pathway:		5.6E-02	
		Total Rad + Chem		2.0E-02		Total Rad + Chem		5.6E-02	*Total:* 7.7E-02

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TABLE B.3.3-17
FUTURE, EXPANDED TRESPASSER
INACTIVE FLYASH PILE: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment					Dermal Contact/Sediment	External Radiation/Sediment			Total
Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk		Compound	Intake	SF(e)	Risk	
NP-237	1.32E-01	5.2E-01	2.2E-10	1.1E-10		NP-237	9.4E-03	4.3E-07	4.0E-09	4.2E-09
PU-238	8.09E-02	3.2E-01	2.2E-10	7.0E-11	Not applicable	PU-238	5.8E-03	2.8E-11	1.6E-13	7.0E-11
PU-239/240	2.09E-02	8.2E-02	2.3E-10	1.9E-11		PU-239/24	1.5E-03	2.7E-11	4.0E-14	1.9E-11
RA-226	1.98E+00	7.8E+00	7.8E-10	6.1E-09		RA-226	1.4E-01	6.0E-06	8.5E-07	8.5E-07
RA-228	2.24E+00	8.8E+00	1.0E-10	8.8E-10		RA-228	1.6E-01	2.9E-06	4.6E-07	4.6E-07
SR-90	8.69E-01	3.4E+00	3.6E-11	1.2E-10		SR-90	6.2E-02			1.2E-10
U-234	7.71E+00	3.0E+01	1.6E-11	4.8E-10		U-234	5.5E-01	3.0E-11	1.6E-11	5.0E-10
U-235/236	5.40E-01	2.1E+00	1.6E-11	3.4E-11		U-235/236	3.8E-02	2.4E-07	9.2E-09	9.3E-09
U-238	7.93E+00	3.1E+01	2.8E-11	8.7E-10		U-238	5.6E-01	3.6E-08	2.0E-08	2.1E-08
			Total Pathway:	8.7E-09	Total Pathway:			Total Pathway:	1.3E-06	

Chemical Risk

Ingestion/Sediment					Dermal Contact/Sediment			External Radiation/Sediment			
Compound	Conc'n (mg/kg	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	3.32E+01	1.2E-07	1.8E+00	2.1E-07	Arsenic	9.7E-08	1.8E+00	4.2E-07					6.2E-07
Beryllium	2.27E+00	8.1E-09	4.3E+00	3.5E-08	Beryllium	6.6E-08		3.5E-08					7.0E-08
Lead	2.38E+01	8.5E-08			Lead	6.9E-07				Not applicable			
2-Methylnaphthalene	1.59E-01	5.7E-10			2-Methylnaphthalene								
Dibenzo(a,h)anthracene	2.20E+00	7.9E-09	7.3E+00	5.7E-08	Dibenzo(a,h)anthracene			5.7E-08					1.1E-07
U-Total	2.34E+01	8.4E-08			U-Total								
			Total Pathway:	3.0E-07			Total Pathway:	5.1E-07			Total Pathway:		
			Total Rad + Chem	3.1E-07			Total Rad + Chem	5.1E-07			Total Rad + Chem	1.3E-06	*Total:* 2.2E-06

TABLE B.3.3-17
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment					Dermal Contact/Sediment	Total
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard		
NP-237	1.32E-01	5.2E-01				
PU-238	8.09E-02	3.2E-01			Not applicable	
PU-239/240	2.09E-02	8.2E-02				
RA-226	1.98E+00	7.8E+00				
RA-228	2.24E+00	8.8E+00				
SR-90	8.69E-01	3.4E+00				
U-234	7.71E+00	3.0E+01				
U-235/236	5.40E-01	2.1E+00				
U-238	7.93E+00	3.1E+01				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Sediment					Dermal Contact/Sediment				
Compound	Conc'n (mg/kg	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	3.32E+01	6.9E-07	3.0E-04	2.3E-03	Arsenic	5.6E-07	2.9E-04	2.0E-03	4.3E-03
Beryllium	2.27E+00	4.7E-08	5.0E-03	9.5E-06	Beryllium	3.9E-07	5.0E-05	7.7E-03	7.7E-03
Lead	2.38E+01	5.0E-07			Lead	4.0E-06			
2-Methylnaphthalene	1.59E-01	3.3E-09			2-Methylnaphthalene	8.1E-07			
Dibenzo(a,h)anthracene	2.20E+00	4.6E-08			Dibenzo(a,h)anthracene				
U-Total	2.34E+01	4.9E-07	3.0E-03	1.6E-04	U-Total	4.0E-06	1.5E-04	2.7E-02	2.7E-02
			Total Pathway:	2.5E-03			Total Pathway:	3.6E-02	
			Total Rad + Chem	2.5E-03			Total Rad + Chem	3.6E-02	*Total:* 3.9E-02

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TABLE B.3.3-18(a)
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE ON-PROPERTY FARMER (RME VALUES)
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	Total
NP-237	7.29E-07	8.4E-02	2.9E-08	2.5E-09	2.5E-09
PU-238	4.54E-07	5.3E-02	3.9E-08	2.1E-09	2.1E-09
PU-239/240	1.18E-07	1.4E-02	3.8E-08	5.2E-10	5.2E-10
RA-226	1.11E-05	1.3E+00	7.0E-09	9.0E-09	9.0E-09
RA-228	1.26E-05	1.5E+00	6.9E-10	1.0E-09	1.0E-09
SR-90	4.88E-06	5.7E-01	6.2E-11	3.5E-11	3.5E-11
TH-228	1.52E-05	1.8E+00	7.8E-08	1.4E-07	1.4E-07
TH-230	1.55E-05	1.8E+00	2.9E-08	5.2E-08	5.2E-08
TH-232	1.31E-05	1.5E+00	1.1E-07	1.7E-07	1.7E-07
U-234	4.85E-05	5.6E+00	2.6E-08	1.5E-07	1.5E-07
U-235/236	3.38E-06	3.9E-01	2.5E-08	9.8E-09	9.8E-09
U-238	4.98E-05	5.8E+00	5.2E-08	3.0E-07	3.0E-07

Total Pathway: 8.3E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.86E-07	1.2E-08	1.5E+01	1.8E-07	1.8E-07
Beryllium	1.27E-08	8.2E-10	8.4E+00	6.9E-09	6.9E-09
Dibenzo(a,h)anthracene	1.23E-08	8.0E-10	6.1E+00	4.9E-09	4.9E-09
Lead	1.34E-07	8.7E-09			
TH-TOTAL	1.20E-07	7.8E-09			
2-Methylnaphthalene	8.98E-10	5.8E-11			

Total Pathway: 1.9E-07

Total Rad + Chem 1.0E-06 *Total:* 1.0E-06

TABLE B.3.3-18(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	7.29E-07	8.4E-02		
PU-238	4.54E-07	5.3E-02		
PU-239/240	1.18E-07	1.4E-02		
RA-226	1.11E-05	1.3E+00		
RA-228	1.26E-05	1.5E+00		
SR-90	4.88E-06	5.7E-01		
TH-228	1.52E-05	1.8E+00		
TH-230	1.55E-05	1.8E+00		
TH-232	1.31E-05	1.5E+00		
U-234	4.85E-05	5.6E+00		
U-235/236	3.38E-06	3.9E-01		
U-238	4.98E-05	5.8E+00		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.86E-07	1.2E-08		
Beryllium	1.27E-08	8.2E-10		
Dibenzo(a,h)anthracene	1.23E-08	8.0E-10		
Lead	1.34E-07	8.7E-09		
TH-TOTAL	1.20E-07	7.8E-09		
2-Methylnaphthalene	8.98E-10	5.8E-11		

Total Pathway:

Total Rad + Chem

Total

Total:

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TABLE B.3.3-18(b)
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE ON-PROPERTY CHILD
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					**Total**
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	7.29E-07	1.5E-03	2.9E-08	4.4E-11	4.4E-11
PU-238	4.54E-07	9.5E-04	3.9E-08	3.7E-11	3.7E-11
PU-239/240	1.18E-07	2.5E-04	3.8E-08	9.4E-12	9.4E-12
RA-226	1.11E-05	2.3E-02	7.0E-09	1.6E-10	1.6E-10
RA-228	1.26E-05	2.6E-02	6.9E-10	1.8E-11	1.8E-11
SR-90	4.88E-06	1.0E-02	6.2E-11	6.4E-13	6.4E-13
TH-228	1.52E-05	3.2E-02	7.8E-08	2.5E-09	2.5E-09
TH-230	1.55E-05	3.3E-02	2.9E-08	9.4E-10	9.4E-10
TH-232	1.31E-05	2.8E-02	1.1E-07	3.0E-09	3.0E-09
U-234	4.85E-05	1.0E-01	2.6E-08	2.6E-09	2.6E-09
U-235/236	3.38E-06	7.1E-03	2.5E-08	1.8E-10	1.8E-10
U-238	4.98E-05	1.0E-01	5.2E-08	5.4E-09	5.4E-09
			Total Pathway:	1.5E-08	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.86E-07	1.0E-09	1.5E+01	1.5E-08	1.5E-08
Beryllium	1.27E-08	7.0E-11	8.4E+00	5.8E-10	5.8E-10
Dibenzo(a,h)anthracene	1.23E-08	6.7E-11	6.1E+00	4.1E-10	4.1E-10
Lead	1.34E-07	7.3E-10			
TH-TOTAL	1.20E-07	6.6E-10			
2-Methylnaphthalene	8.98E-10	4.9E-12			
			Total Pathway:	1.6E-08	

Total Rad + Chem	3.1E-08	*Total:*	3.1E-08

TABLE B.3.3-18(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	7.29E-07	1.5E-03		
PU-238	4.54E-07	9.5E-04		
PU-239/240	1.18E-07	2.5E-04		
RA-226	1.11E-05	2.3E-02		
RA-228	1.26E-05	2.6E-02		
SR-90	4.88E-06	1.0E-02		
TH-228	1.52E-05	3.2E-02		
TH-230	1.55E-05	3.3E-02		
TH-232	1.31E-05	2.8E-02		
U-234	4.85E-05	1.0E-01		
U-235/236	3.38E-06	7.1E-03		
U-238	4.98E-05	1.0E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.86E-07	1.2E-08		
Beryllium	1.27E-08	8.1E-10		
Dibenzo(a,h)anthracene	1.23E-08	7.9E-10		
Lead	1.34E-07	8.6E-09		
TH-TOTAL	1.20E-07	7.7E-09		
2-Methylnaphthalene	8.98E-10	5.7E-11		

Total Pathway:

Total Rad + Chem

Total
Total:

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TABLE B.3.3-19(a)
FUTURE, ON-PROPERTY FARMER FARMER (RME VALUES)
INACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.9E-02	9.3E+02	2.2E-10	2.0E-07
SR-90	2.7E-02	1.3E+03	3.6E-11	4.8E-08
TC-99	1.8E+00	8.9E+04	1.3E-12	1.2E-07
U-234	4.7E+02	2.3E+07	1.6E-11	3.7E-04
U-235/236	2.5E+01	1.2E+06	1.6E-11	2.0E-05
U-238	5.2E+02	2.5E+07	2.8E-11	7.1E-04

Total Pathway: 1.1E-03

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene	7.2E-04	2.0E-05		
Lead	1.4E-03	3.9E-05		
Tributyl phosphate	1.4E-03	3.9E-05		
U-TOTAL	1.8E+00	5.0E-02		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene	7.4E-05		
Lead	1.5E-04		
Tributyl phosphate	1.5E-04		
U-TOTAL	1.9E-01		

Total Pathway:

Total Rad + Chem 1.1E-03

Total Rad + Chem

TABLE B.3.3-19(a)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	2.0E-07
	4.8E-08
	1.2E-07
	3.7E-04
	2.0E-05
	7.1E-04

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene	8.0E-06		
Lead	4.5E-10		
Tributyl phosphate			
U-TOTAL	1.4E-04		

Total Pathway:

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 1.1E-03

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TABLE B.3.3-19(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	1.9E-02	9.3E+02		
SR-90	2.7E-02	1.3E+03		
TC-99	1.8E+00	8.9E+04		
U-234	4.7E+02	2.3E+07		
U-235/236	2.5E+01	1.2E+06		
U-238	5.2E+02	2.5E+07		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene	7.2E-04	2.0E-05		
Lead	1.4E-03	3.9E-05		
Tributyl phosphate	1.4E-03	3.9E-05	5.0E-03	7.8E-03
U-TOTAL	1.8E+00	5.0E-02	3.0E-03	1.7E+01

Total Pathway: 1.7E+01

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene	7.4E-05		
Lead	1.5E-04		
Tributyl phosphate	1.5E-04		
U-TOTAL	1.9E-01		

Total Pathway:

Total Rad + Chem 1.7E+01

Total Rad + Chem

TABLE B.3.3-19(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	

Total Pathway:

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene	8.0E-06			
Lead	4.5E-10			
Tributyl phosphate	3.5E-06	4.5E-03	7.9E-04	8.6E-03
U-TOTAL	1.4E-04	1.5E-04	9.7E-01	1.8E+01
		Total Pathway:	9.7E-01	

Total Rad + Chem 9.7E-01 *Total:* 1.8E+01

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TABLE B.3.3-19(b)
FUTURE, ON-PROPERTY FARMER CHILD
INACTIVE FLYASH PILE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.9E-02	4.0E+01	2.2E-10	8.8E-09
SR-90	2.7E-02	5.7E+01	3.6E-11	2.1E-09
TC-99	1.8E+00	3.8E+03	1.3E-12	5.0E-09
U-234	4.7E+02	9.8E+05	1.6E-11	1.6E-05
U-235/236	2.5E+01	5.3E+04	1.6E-11	8.4E-07
U-238	5.2E+02	1.1E+06	2.8E-11	3.0E-05

Total Pathway: 4.7E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene	7.2E-04	3.9E-06		
Lead	1.4E-03	7.8E-06		
Tributyl phosphate	1.4E-03	7.8E-06		
U-TOTAL	1.8E+00	1.0E-02		

Total Pathway:

Total Rad + Chem 4.7E-05

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene	2.9E-05		
Lead	5.9E-05		
Tributyl phosphate	5.9E-05		
U-TOTAL	7.6E-02		

Total Pathway:

Total Rad + Chem

TABLE B.3.3-19(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	Total
Dermal Contact/Groundwater	
Not applicable	8.8E-09
	2.1E-09
	5.0E-09
	1.6E-05
	8.4E-07
	3.0E-05

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene	1.1E-06		
Lead	6.3E-11		
Tributyl phosphate	5.2E-06		
U-TOTAL	2.0E-05		

Total Pathway:

Total Rad + Chem *Total:* 4.7E-05

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TABLE B.3.3-19(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237	1.9E-02	4.0E+01			Not applicable
SR-90	2.7E-02	5.7E+01			
TC-99	1.8E+00	3.8E+03			
U-234	4.7E+02	9.8E+05			
U-235/236	2.5E+01	5.3E+04			
U-238	5.2E+02	1.1E+06			
Total Pathway:					Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene	7.2E-04	4.6E-05			2-Methylnaphthalene	3.4E-04		
Lead	1.4E-03	9.1E-05			Lead	6.9E-04		
Tributyl phosphate	1.4E-03	9.1E-05	5.0E-03	1.8E-02	Tributyl phosphate.	6.9E-04		
U-TOTAL	1.8E+00	1.2E-01	3.0E-03	3.9E+01	U-TOTAL	8.8E-01		
			Total Pathway:	3.9E+01				Total Pathway:
			Total Rad + Chem	3.9E+01				Total Rad + Chem

TABLE B.3.3-19(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	Total
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene	1.3E-05			
Lead	7.3E-10			
Tributyl phosphate	5.7E-06	4.5E-03	1.3E-03	2.0E-02
U-TOTAL	2.4E-04	1.5E-04	1.6E+00	4.1E+01
		Total Pathway:	1.6E+00	

Total Rad + Chem 1.6E+00 *Total:* 4.1E+01

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TABLE B.3.3-20(a)

FUTURE ON-PROPERTY FARMER (RME VALUES)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.60E-07	7.1E-01	2.2E-10	1.6E-10
PU-238	2.22E-07	4.4E-01	2.2E-10	9.6E-11
PU-239/240	5.78E-08	1.1E-01	2.3E-10	2.6E-11
RA-226	5.59E-06	1.1E+01	7.8E-10	8.6E-09
RA-228	6.19E-06	1.2E+01	1.0E-10	1.2E-09
SR-90	7.28E-06	1.4E+01	3.6E-11	5.2E-10
TH-228	7.43E-06	1.5E+01	5.5E-11	8.0E-10
TH-230	7.75E-06	1.5E+01	1.3E-11	2.0E-10
TH-232	6.55E-06	1.3E+01	1.7E-10	2.2E-09
U-234	2.38E-05	4.7E+01	1.6E-11	7.5E-10
U-235/236	1.66E-06	3.3E+00	1.6E-11	5.2E-11
U-238	2.44E-05	4.8E+01	2.8E-11	1.3E-09

Total Pathway: 1.6E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.60E-07	3.8E-01	2.2E-10	8.3E-11
PU-238	2.22E-07	2.3E-01	2.2E-10	5.1E-11
PU-239/240	5.78E-08	6.0E-02	2.3E-10	1.4E-11
RA-226	5.59E-06	5.8E+00	7.8E-10	4.6E-09
RA-228	6.13E-06	6.4E+00	1.0E-10	6.4E-10
SR-90	7.27E-06	7.6E+00	3.6E-11	2.7E-10
TH-228	7.22E-06	7.5E+00	5.5E-11	4.1E-10
TH-230	7.75E-06	8.1E+00	1.3E-11	1.1E-10
TH-232	6.55E-06	6.8E+00	1.7E-10	1.2E-09
U-234	2.38E-05	2.5E+01	1.6E-11	4.0E-10
U-235/236	1.66E-06	1.7E+00	1.6E-11	2.8E-11
U-238	2.44E-05	2.5E+01	2.8E-11	7.1E-10

Total Pathway: 8.4E-09

Total
2.4E-10
1.5E-10
4.0E-11
1.3E-08
1.9E-09
7.9E-10
1.2E-09
3.0E-10
3.4E-09
1.1E-09
8.0E-11
2.1E-09

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.12E-04	1.2E-07	1.8E+00	2.2E-07
Beryllium	6.66E-06	7.3E-09	4.3E+00	3.2E-08
Dibenzo(a,h)anthracene	6.15E-06	6.8E-09	7.3E+00	4.9E-08
Lead	6.99E-05	7.7E-08		
TH-TOTAL	6.00E-05	6.6E-08		
2-Methylnaphthalene	1.54E-06	1.7E-09		

Total Pathway: 3.0E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.12E-04	6.5E-08	1.8E+00	1.1E-07
Beryllium	6.66E-06	3.9E-09	4.3E+00	1.7E-08
Dibenzo(a,h)anthracene	6.11E-06	3.6E-09	7.3E+00	2.6E-08
Lead	6.99E-05	4.1E-08		
TH-TOTAL	6.00E-05	3.5E-08		
2-Methylnaphthalene	1.54E-06	9.0E-10		

Total Pathway: 1.6E-07

		Total Rad + Chem	3.1E-07
		Total Rad + Chem	1.7E-07

3.3E-07	
4.8E-08	
7.5E-08	
Total:	4.8E-07

TABLE B.3.3-20(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.6E-07	7.1E-01		
PU-238	2.2E-07	4.4E-01		
PU-239/240	5.8E-08	1.1E-01		
RA-226	5.6E-06	1.1E+01		
RA-228	6.2E-06	1.2E+01		
SR-90	7.3E-06	1.4E+01		
TH-228	7.4E-06	1.5E+01		
TH-230	7.7E-06	1.5E+01		
TH-232	6.5E-06	1.3E+01		
U-234	2.4E-05	4.7E+01		
U-235/236	1.7E-06	3.3E+00		
U-238	2.4E-05	4.8E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.60E-07	3.8E-01		
PU-238	2.22E-07	2.3E-01		
PU-239/240	5.78E-08	6.0E-02		
RA-226	5.59E-06	5.8E+00		
RA-228	6.13E-06	6.4E+00		
SR-90	7.27E-06	7.6E+00		
TH-228	7.22E-06	7.5E+00		
TH-230	7.75E-06	8.1E+00		
TH-232	6.55E-06	6.8E+00		
U-234	2.38E-05	2.5E+01		
U-235/236	1.66E-06	1.7E+00		
U-238	2.44E-05	2.5E+01		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.1E-04	1.2E-07	3.0E-04	4.1E-04
Beryllium	6.7E-06	7.3E-09	5.0E-03	1.5E-06
Dibenzo(a,h)anthracene	6.1E-06	6.8E-09		
Lead	7.0E-05	7.7E-08		
TH-TOTAL	6.0E-05	6.6E-08		
2-Methylnaphthalene	1.5E-06	1.7E-09		

Total Pathway: 4.1E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.12E-04	6.5E-08	3.0E-04	2.2E-04
Beryllium	6.66E-06	3.9E-09	5.0E-03	7.8E-07
Dibenzo(a,h)anthracene	6.11E-06	3.6E-09		
Lead	6.99E-05	4.1E-08		
TH-TOTAL	6.00E-05	3.5E-08		
2-Methylnaphthalene	1.54E-06	9.0E-10		

Total Pathway: 2.2E-04

Total Rad + Chem	4.1E-04	Total Rad + Chem	2.2E-04

		Total
		6.3E-04
		2.2E-06

Total: 6.3E-04

TABLE B.3.3-20(a)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	9.41E-05	1.9E+02	2.2E-10	4.1E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.74E-04	9.3E+02	3.6E-11	3.4E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.30E+00	4.5E+06	1.6E-11	7.2E-05
U-235/236	1.23E-01	2.4E+05	1.6E-11	3.9E-06
U-238	2.53E+00	5.0E+06	2.8E-11	1.4E-04
TC-99	9.50E-03	1.9E+04	1.3E-12	2.4E-08

Total Pathway: 2.2E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk
NP-237	9.41E-05	9.8E+01	2.2E-10	2.2E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.73E-04	4.9E+02	3.6E-11	1.8E-08
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.30E+00	2.4E+06	1.6E-11	3.8E-05
U-235/236	1.23E-01	1.3E+05	1.6E-11	2.0E-06
U-238	2.53E+00	2.6E+06	2.8E-11	7.4E-05
TC-99	9.50E-03	9.9E+03	1.3E-12	1.3E-08

Total Pathway: 1.1E-04

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	7.58E-03	8.3E-06		
TH-TOTAL				
2-Methylnaphthalene	1.45E-02	1.6E-05		
Tributyl phosphate	7.79E-03	8.6E-06		
U-TOTAL	9.02E+00	9.9E-03		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	7.58E-03	4.4E-06		
TH-TOTAL				
2-Methylnaphthalene	1.45E-02	8.5E-06		
Tributyl phosphate	7.79E-03	4.5E-06		
U-TOTAL	9.02E+00	5.3E-03		

Total Pathway:

Total Rad + Chem 2.2E-04

Total Rad + Chem 1.1E-04

	Total	Total Dust & Groundwater Affected
	6.2E-08	6.3E-08
		1.5E-10
		4.0E-11
		1.3E-08
		1.9E-09
	5.1E-08	5.2E-08
		1.2E-09
		3.0E-10
		3.4E-09
	1.1E-04	1.1E-04
	5.9E-06	5.9E-06
	2.1E-04	2.1E-04
	3.7E-08	3.7E-08
		3.3E-07
		4.8E-08
		7.5E-08
Total:	3.3E-04	3.3E-04

TABLE B.3.3-20(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	9.4E-05	1.9E+02		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	4.7E-04	9.3E+02		
TH-228				
TH-230				
TH-232				
U-234	2.3E+00	4.5E+06		
U-235/236	1.2E-01	2.4E+05		
U-238	2.5E+00	5.0E+06		
TC-99	9.5E-03	1.9E+04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	9.41E-05	9.8E+01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	4.73E-04	4.9E+02		
TH-228				
TH-230				
TH-232				
U-234	2.30E+00	2.4E+06		
U-235/236	1.23E-01	1.3E+05		
U-238	2.53E+00	2.6E+06		
TC-99	9.50E-03	9.9E+03		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	7.6E-03	8.3E-06		
TH-TOTAL				
2-Methylnaphthalene	1.4E-02	1.6E-05		
Tributyl phosphate	7.8E-03	8.6E-06	5.0E-03	1.7E-03
U-TOTAL	9.0E+00	9.9E-03	3.0E-03	3.3E+00

Total Pathway: 3.3E+00

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	7.58E-03	4.4E-06		
TH-TOTAL				
2-Methylnaphthalene	1.45E-02	8.5E-06		
Tributyl phosphate	7.79E-03	4.5E-06	5.0E-03	2.3E-08
U-TOTAL	9.02E+00	5.3E-03	3.0E-03	1.6E-05

Total Pathway: 1.6E-05

Total Rad + Chem 3.3E+00

Total Rad + Chem 1.6E-05

	Total	Total Dust & Groundwater Affected
		6.3E-04
		2.2E-06
	1.7E-03	1.7E-03
	3.3E+00	3.3E+00
Total:	3.3E+00	3.3E+00

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TABLE B.3.3-20(b)

FUTURE ON-PROPERTY CHILD

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	3.60E-07	3.0E-02	2.2E-10	6.7E-12	NP-237	3.60E-07	4.6E-02	2.2E-10	1.0E-11	1.7E-11
PU-238	2.22E-07	1.9E-02	2.2E-10	4.1E-12	PU-238	2.22E-07	2.9E-02	2.2E-10	6.3E-12	1.0E-11
PU-239/240	5.78E-08	4.9E-03	2.3E-10	1.1E-12	PU-239/240	5.78E-08	7.4E-03	2.3E-10	1.7E-12	2.8E-12
RA-226	5.59E-06	4.7E-01	7.8E-10	3.7E-10	RA-226	5.59E-06	7.2E-01	7.8E-10	5.6E-10	9.3E-10
RA-228	6.19E-06	5.2E-01	1.0E-10	5.2E-11	RA-228	6.13E-06	7.9E-01	1.0E-10	7.9E-11	1.3E-10
SR-90	7.28E-06	6.1E-01	3.6E-11	2.2E-11	SR-90	7.27E-06	9.3E-01	3.6E-11	3.4E-11	5.6E-11
TH-228	7.43E-06	6.2E-01	5.5E-11	3.4E-11	TH-228	7.22E-06	9.3E-01	5.5E-11	5.1E-11	8.5E-11
TH-230	7.75E-06	6.5E-01	1.3E-11	8.5E-12	TH-230	7.75E-06	1.0E+00	1.3E-11	1.3E-11	2.1E-11
TH-232	6.55E-06	5.5E-01	1.7E-10	9.4E-11	TH-232	6.55E-06	8.4E-01	1.7E-10	1.4E-10	2.4E-10
U-234	2.38E-05	2.0E+00	1.6E-11	3.2E-11	U-234	2.38E-05	3.1E+00	1.6E-11	4.9E-11	8.1E-11
U-235/236	1.66E-06	1.4E-01	1.6E-11	2.2E-12	U-235/236	1.66E-06	2.1E-01	1.6E-11	3.4E-12	5.6E-12
U-238	2.44E-05	2.0E+00	2.8E-11	5.7E-11	U-238	2.44E-05	3.1E+00	2.8E-11	8.8E-11	1.5E-10
			Total Pathway:	6.8E-10				Total Pathway:	1.0E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	1.12E-04	2.5E-08	1.8E+00	4.3E-08	Arsenic	1.12E-04	3.8E-08	1.8E+00	6.6E-08	1.1E-07
Beryllium	6.66E-06	1.5E-09	4.3E+00	6.3E-09	Beryllium	6.66E-06	2.2E-09	4.3E+00	9.6E-09	1.6E-08
Dibenzo(a,h)anthracene	6.15E-06	1.3E-09	7.3E+00	9.8E-09	Dibenzo(a,h)anthracene	6.11E-06	2.1E-09	7.3E+00	1.5E-08	2.5E-08
Lead	6.99E-05	1.5E-08			Lead	6.99E-05	2.3E-08			
TH-TOTAL	6.00E-05	1.3E-08			TH-TOTAL	6.00E-05	2.0E-08			
2-Methylnaphthalene	1.54E-06	3.4E-10			2-Methylnaphthalene	1.54E-06	5.2E-10			
			Total Pathway:	5.9E-08				Total Pathway:	9.0E-08	
			Total Rad + Chem	6.0E-08				Total Rad + Chem	9.1E-08	*Total:* 1.5E-07

TABLE B.3.3-20(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.6E-07	3.0E-02		
PU-238	2.2E-07	1.9E-02		
PU-239/240	5.8E-08	4.9E-03		
RA-226	5.6E-06	4.7E-01		
RA-228	6.2E-06	5.2E-01		
SR-90	7.3E-06	6.1E-01		
TH-228	7.4E-06	6.2E-01		
TH-230	7.7E-06	6.5E-01		
TH-232	6.5E-06	5.5E-01		
U-234	2.4E-05	2.0E+00		
U-235/236	1.7E-06	1.4E-01		
U-238	2.4E-05	2.0E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.60E-07	4.6E-02		
PU-238	2.22E-07	2.9E-02		
PU-239/240	5.78E-08	7.4E-03		
RA-226	5.59E-06	7.2E-01		
RA-228	6.13E-06	7.9E-01		
SR-90	7.27E-06	9.3E-01		
TH-228	7.22E-06	9.3E-01		
TH-230	7.75E-06	1.0E+00		
TH-232	6.55E-06	8.4E-01		
U-234	2.38E-05	3.1E+00		
U-235/236	1.66E-06	2.1E-01		
U-238	2.44E-05	3.1E+00		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.1E-04	2.9E-07	3.0E-04	9.6E-04
Beryllium	6.7E-06	1.7E-08	5.0E-03	3.4E-06
Dibenzo(a,h)anthracene	6.1E-06	1.6E-08		
Lead	7.0E-05	1.8E-07		
TH-TOTAL	6.0E-05	1.5E-07		
2-Methylnaphthalene	1.5E-06	3.9E-09		

Total Pathway: 9.6E-04

Total Rad + Chem 9.6E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.12E-04	4.4E-07	3.0E-04	1.5E-03
Beryllium	6.66E-06	2.6E-08	5.0E-03	5.2E-06
Dibenzo(a,h)anthracene	6.11E-06	2.4E-08		
Lead	6.99E-05	2.7E-07		
TH-TOTAL	6.00E-05	2.3E-07		
2-Methylnaphthalene	1.54E-06	6.0E-09		

Total Pathway: 1.5E-03

Total Rad + Chem 1.5E-03

Total	
	2.4E-03
	8.6E-06

Total: 2.4E-03

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TABLE B.3.3-20(b)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk		
NP-237	9.41E-05	7.9E+00	2.2E-10	1.7E-09	NP-237	9.41E-05	1.2E+01	2.2E-10	2.7E-09	4.4E-09	4.4E-09
PU-238			2.2E-10		PU-238			2.2E-10			1.0E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			2.8E-12
RA-226			7.8E-10		RA-226			7.8E-10			9.3E-10
RA-228			1.0E-10		RA-228			1.0E-10			1.3E-10
SR-90	4.74E-04	4.0E+01	3.6E-11	1.4E-09	SR-90	4.73E-04	6.1E+01	3.6E-11	2.2E-09	3.6E-09	3.7E-09
TH-228			5.5E-11		TH-228			5.5E-11			8.5E-11
TH-230			1.3E-11		TH-230			1.3E-11			2.1E-11
TH-232			1.7E-10		TH-232			1.7E-10			2.4E-10
U-234	2.30E+00	1.9E+05	1.6E-11	3.1E-06	U-234	2.30E+00	3.0E+05	1.6E-11	4.7E-06	7.8E-06	7.8E-06
U-235/236	1.23E-01	1.0E+04	1.6E-11	1.6E-07	U-235/236	1.23E-01	1.6E+04	1.6E-11	2.5E-07	4.2E-07	4.2E-07
U-238	2.53E+00	2.1E+05	2.8E-11	6.0E-06	U-238	2.53E+00	3.3E+05	2.8E-11	9.1E-06	1.5E-05	1.5E-05
TC-99	9.50E-03	8.0E+02	1.3E-12	1.0E-09	TC-99	9.50E-03	1.2E+03	1.3E-12	1.6E-09	2.6E-09	2.6E-09
		Total Pathway:		9.2E-06			Total Pathway:		1.4E-05		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit				
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00		Arsenic			1.8E+00	
Beryllium			4.3E+00		Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00	
Lead	7.58E-03	1.7E-06			Lead	7.58E-03	2.5E-06		
TH-TOTAL					TH-TOTAL				
2-Methylnaphthalene	1.45E-02	3.2E-06			2-Methylnaphthalene	1.45E-02	4.9E-06		
Tributyl phosphate	7.79E-03	1.7E-06			Tributyl phosphate	7.79E-03	2.6E-06		
U-TOTAL	9.02E+00	2.0E-03			U-TOTAL	9.02E+00	3.0E-03		
		Total Pathway:					Total Pathway:		
		Total Rad + Chem		9.2E-06			Total Rad + Chem		1.4E-05

	Total	Total Dust & Groundwater Affected
		1.1E-07
		1.6E-08
		2.5E-08
Total:	2.3E-05	2.3E-05

TABLE B.3.3-20(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	9.4E-05	7.9E+00		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	4.7E-04	4.0E+01		
TH-228				
TH-230				
TH-232				
U-234	2.3E+00	1.9E+05		
U-235/236	1.2E-01	1.0E+04		
U-238	2.5E+00	2.1E+05		
TC-99	9.5E-03	8.0E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	9.41E-05	1.2E+01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	4.73E-04	6.1E+01		
TH-228				
TH-230				
TH-232				
U-234	2.30E+00	3.0E+05		
U-235/236	1.23E-01	1.6E+04		
U-238	2.53E+00	3.3E+05		
TC-99	9.50E-03	1.2E+03		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	7.6E-03	1.9E-05		
TH-TOTAL				
2-Methylnaphthalene	1.4E-02	3.7E-05		
Tributyl phosphate	7.8E-03	2.0E-05	5.0E-03	4.0E-03
U-TOTAL	9.0E+00	2.3E-02	3.0E-03	7.7E+00

Total Pathway: 7.7E+00

Total Rad + Chem 7.7E+00

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	7.58E-03	3.0E-05		
TH-TOTAL				
2-Methylnaphthalene	1.45E-02	5.7E-05		
Tributyl phosphate	7.79E-03	3.0E-05	5.0E-03	6.1E-03
U-TOTAL	9.02E+00	3.5E-02	3.0E-03	1.2E+01

Total Pathway: 1.2E+01

Total Rad + Chem 1.2E+01

	Total	Total Dust & Groundwater Affected
		2.4E-03
		8.6E-06
	1.0E-02	1.0E-02
	1.9E+01	1.9E+01
Total:	1.9E+01	1.9E+01

TABLE B.3.3-21(a)
FUTURE ON-PROPERTY FARMER (RME VALUES)
INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.97E-06	3.6E-03	2.2E-10	8.0E-13	NP-237	1.79E-07	1.3E-03	2.2E-10	2.9E-13	1.1E-12
PU-238	1.15E-08	2.1E-05	2.2E-10	4.7E-15	PU-238	2.30E-09	1.7E-05	2.2E-10	3.7E-15	8.4E-15
PU-239/240	3.21E-09	5.9E-06	2.3E-10	1.4E-15	PU-239/240	6.42E-10	4.7E-06	2.3E-10	1.1E-15	2.4E-15
RA-226	1.98E-04	3.6E-01	7.8E-10	2.8E-10	RA-226	3.57E-04	2.6E+00	7.8E-10	2.0E-09	2.3E-09
RA-228	1.44E-04	2.6E-01	1.0E-10	2.6E-11	RA-228	2.58E-04	1.9E+00	1.0E-10	1.9E-10	2.2E-10
SR-90	1.78E-03	3.3E+00	3.6E-11	1.2E-10	SR-90	8.90E-03	6.5E+01	3.6E-11	2.4E-09	2.5E-09
TH-228	3.77E-06	6.9E-03	5.5E-11	3.8E-13	TH-228	3.14E-06	2.3E-02	5.5E-11	1.3E-12	1.7E-12
TH-230	1.87E-05	3.4E-02	1.3E-11	4.5E-13	TH-230	1.56E-05	1.1E-01	1.3E-11	1.5E-12	1.9E-12
TH-232	1.59E-05	2.9E-02	1.7E-10	5.0E-12	TH-232	1.32E-05	9.7E-02	1.7E-10	1.7E-11	2.1E-11
U-234	4.19E-04	7.7E-01	1.6E-11	1.2E-11	U-234	1.26E-03	9.2E+00	1.6E-11	1.5E-10	1.6E-10
U-235/236	2.92E-05	5.4E-02	1.6E-11	8.6E-13	U-235/236	8.76E-05	6.4E-01	1.6E-11	1.0E-11	1.1E-11
U-238	4.30E-04	7.9E-01	2.8E-11	2.2E-11	U-238	1.29E-03	9.5E+00	2.8E-11	2.7E-10	2.9E-10
			Total Pathway:	4.7E-10				Total Pathway:	5.0E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	5.71E-05	5.9E-08	1.8E+00	1.0E-07	Arsenic	1.71E-06	7.0E-09	1.8E+00	1.2E-08	1.1E-07
Beryllium	1.25E-06	1.3E-09	4.3E+00	5.5E-09	Beryllium	1.12E-09	4.6E-12	4.3E+00	2.0E-11	5.5E-09
Dibenzo(a,h)anthracene	9.94E-05	1.0E-07	7.3E+00	7.5E-07	Dibenzo(a,h)anthracene	3.14E-05	1.3E-07	7.3E+00	9.4E-07	1.7E-06
Lead	2.65E-06	2.7E-09			Lead	2.21E-06	9.1E-09			
TH-TOTAL	1.45E-07	1.5E-10			TH-TOTAL	1.21E-07	5.0E-10			
2-Methylnaphthalene	3.14E-08	3.2E-11			2-Methylnaphthalene	9.93E-09	4.1E-11			
			Total Pathway:	8.5E-07				Total Pathway:	9.6E-07	
			Total Rad + Chem	8.5E-07				Total Rad + Chem	9.6E-07	*Total:* 1.8E-06

TABLE B.3.3-21(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	2.0E-06	3.6E-03			NP-237	1.79E-07	1.3E-03			
PU-238	1.2E-08	2.1E-05			PU-238	2.30E-09	1.7E-05			
PU-239/240	3.2E-09	5.9E-06			PU-239/240	6.42E-10	4.7E-06			
RA-226	2.0E-04	3.6E-01			RA-226	3.57E-04	2.6E+00			
RA-228	1.4E-04	2.6E-01			RA-228	2.58E-04	1.9E+00			
SR-90	1.8E-03	3.3E+00			SR-90	8.90E-03	6.5E+01			
TH-228	3.8E-06	6.9E-03			TH-228	3.14E-06	2.3E-02			
TH-230	1.9E-05	3.4E-02			TH-230	1.56E-05	1.1E-01			
TH-232	1.6E-05	2.9E-02			TH-232	1.32E-05	9.7E-02			
U-234	4.2E-04	7.7E-01			U-234	1.26E-03	9.2E+00			
U-235/236	2.9E-05	5.4E-02			U-235/236	8.76E-05	6.4E-01			
U-238	4.3E-04	7.9E-01			U-238	1.29E-03	9.5E+00			
Total Pathway:					Total Pathway:					

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	5.7E-05	5.9E-08	3.0E-04	2.0E-04	Arsenic	1.71E-06	7.0E-09	3.0E-04	2.3E-05	2.2E-04
Beryllium	1.2E-06	1.3E-09	5.0E-03	2.6E-07	Beryllium	1.12E-09	4.6E-12	5.0E-03	9.2E-10	2.6E-07
Dibenzo(a,h)anthracene	9.9E-05	1.0E-07			Dibenzo(a,h)anthracene	3.14E-05	1.3E-07			
Lead	2.7E-06	2.7E-09			Lead	2.21E-06	9.1E-09			
TH-TOTAL	1.5E-07	1.5E-10			TH-TOTAL	1.21E-07	5.0E-10			
2-Methylnaphthalene	3.1E-08	3.2E-11			2-Methylnaphthalene	9.93E-09	4.1E-11			
Total Pathway:				2.0E-04	Total Pathway:				2.3E-05	
Total Rad + Chem				2.0E-04	Total Rad + Chem				2.3E-05	*Total:* 2.2E-04

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TABLE B.3.3-21(a)
(continued)
INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	onc'n in Beef (pCi/kg	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk		
NP-237	3.41E-04	6.3E-01	2.2E-10	1.4E-10	NP-237	3.19E-05	2.3E-01	2.2E-10	5.2E-11	1.9E-10	1.9E-10
PU-238			2.2E-10		PU-238			2.2E-10			8.4E-15
PU-239/240			2.3E-10		PU-239/240			2.3E-10			2.4E-15
RA-226			7.8E-10		RA-226			7.8E-10			2.3E-09
RA-228			1.0E-10		RA-228			1.0E-10			2.2E-10
SR-90	6.18E-02	1.1E+02	3.6E-11	4.1E-09	SR-90	3.09E-01	2.3E+03	3.6E-11	8.2E-08	8.6E-08	8.8E-08
TH-228			5.5E-11		TH-228			5.5E-11			1.7E-12
TH-230			1.3E-11		TH-230			1.3E-11			1.9E-12
TH-232			1.7E-10		TH-232			1.7E-10			2.1E-11
U-234	2.74E+01	5.0E+04	1.6E-11	8.0E-07	U-234	8.49E+01	6.2E+05	1.6E-11	1.0E-05	1.1E-05	1.1E-05
U-235/236	1.46E+00	2.7E+03	1.6E-11	4.3E-08	U-235/236	4.53E+00	3.3E+04	1.6E-11	5.3E-07	5.8E-07	5.8E-07
U-238	3.02E+01	5.5E+04	2.8E-11	1.6E-06	U-238	9.36E+01	6.9E+05	2.8E-11	1.9E-05	2.1E-05	2.1E-05
TC-99	6.36E+00	1.2E+04	1.3E-12	1.5E-08	TC-99	7.66E+00	5.6E+04	1.3E-12	7.3E-08	8.8E-08	8.8E-08
		Total Pathway:		2.4E-06			Total Pathway:		3.0E-05		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	onc'n in Beef (mg/kg	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			1.1E-07
Beryllium			4.3E+00		Beryllium			4.3E+00			5.5E-09
Dibenzo(a,h)anthracen			7.3E+00		Dibenzo(a,h)anthrace			7.3E+00			1.7E-06
Lead	1.76E-04	1.8E-07			Lead	1.50E-04	6.2E-07				
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene	1.54E-04	1.6E-07			2-Methylnaphthalene	4.93E-05	2.0E-07				
Tributyl phosphate	2.20E-06	2.3E-09			Tributyl phosphate	7.10E-07	2.9E-09				
U-TOTAL	1.07E-01	1.1E-04			U-TOTAL	3.33E-01	1.4E-03				
		Total Pathway:					Total Pathway:				
		Total Rad + Chem		2.4E-06			Total Rad + Chem		3.0E-05	*Total:* 3.2E-05	3.4E-05

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TABLE B.3.3-21(a)
(continued)
INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.4E-04	6.3E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	6.2E-02	1.1E+02		
TH-228				
TH-230				
TH-232				
U-234	2.7E+01	5.0E+04		
U-235/236	1.5E+00	2.7E+03		
U-238	3.0E+01	5.5E+04		
TC-99	6.4E+00	1.2E+04		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	3.19E-05	2.3E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.09E-01	2.3E+03		
TH-228				
TH-230				
TH-232				
U-234	8.49E+01	6.2E+05		
U-235/236	4.53E+00	3.3E+04		
U-238	9.36E+01	6.9E+05		
TC-99	7.66E+00	5.6E+04		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.8E-04	1.8E-07		
TH-TOTAL				
2-Methylnaphthalene	1.5E-04	1.6E-07		
Tributyl phosphate	2.2E-06	2.3E-09	5.0E-03	4.5E-07
U-TOTAL	1.1E-01	1.1E-04	3.0E-03	3.7E-02

Total Pathway: 3.7E-02

Total Rad + Chem 3.7E-02

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.50E-04	6.2E-07		
TH-TOTAL				
2-Methylnaphthalene	4.93E-05	2.0E-07		
Tributyl phosphate	7.10E-07	2.9E-09	5.0E-03	5.8E-07
U-TOTAL	3.33E-01	1.4E-03	3.0E-03	4.6E-01

Total Pathway: 4.6E-01

Total Rad + Chem 4.6E-01

	Total	Total Dust & Groundwater Affected
		2.2E-04
		2.6E-07
	1.0E-06	1.0E-06
	4.9E-01	4.9E-01
Total:	4.9E-01	4.9E-01

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TABLE B.3.3-21(b)
FUTURE ON-PROPERTY CHILD
INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	onc'n in Beef (pCi/kg	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.97E-06	1.2E-04	2.2E-10	2.6E-14	NP-237	1.79E-07	2.6E-04	2.2E-10	5.6E-14	8.3E-14
PU-238	1.15E-08	7.0E-07	2.2E-10	1.5E-16	PU-238	2.30E-09	3.3E-06	2.2E-10	7.2E-16	8.8E-16
PU-239/240	3.21E-09	2.0E-07	2.3E-10	4.5E-17	PU-239/240	6.42E-10	9.2E-07	2.3E-10	2.1E-16	2.6E-16
RA-226	1.98E-04	1.2E-02	7.8E-10	9.4E-12	RA-226	3.57E-04	5.1E-01	7.8E-10	4.0E-10	4.1E-10
RA-228	1.44E-04	8.7E-03	1.0E-10	8.7E-13	RA-228	2.58E-04	3.7E-01	1.0E-10	3.7E-11	3.8E-11
SR-90	1.78E-03	1.1E-01	3.6E-11	3.9E-12	SR-90	8.90E-03	1.3E+01	3.6E-11	4.6E-10	4.6E-10
TH-228	3.77E-06	2.3E-04	5.5E-11	1.3E-14	TH-228	3.14E-06	4.5E-03	5.5E-11	2.5E-13	2.6E-13
TH-230	1.87E-05	1.1E-03	1.3E-11	1.5E-14	TH-230	1.56E-05	2.2E-02	1.3E-11	2.9E-13	3.0E-13
TH-232	1.59E-05	9.7E-04	1.7E-10	1.6E-13	TH-232	1.32E-05	1.9E-02	1.7E-10	3.2E-12	3.4E-12
U-234	4.19E-04	2.6E-02	1.6E-11	4.1E-13	U-234	1.26E-03	1.8E+00	1.6E-11	2.9E-11	2.9E-11
U-235/236	2.92E-05	1.8E-03	1.6E-11	2.8E-14	U-235/236	8.76E-05	1.3E-01	1.6E-11	2.0E-12	2.0E-12
U-238	4.30E-04	2.6E-02	2.8E-11	7.3E-13	U-238	1.29E-03	1.8E+00	2.8E-11	5.2E-11	5.2E-11
			Total Pathway:	1.6E-11				Total Pathway:	9.8E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	onc'n in Beef (mg/kg	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	5.71E-05	9.1E-09	1.8E+00	1.6E-08	Arsenic	1.71E-06	6.4E-09	1.8E+00	1.1E-08	2.7E-08
Beryllium	1.25E-06	2.0E-10	4.3E+00	8.5E-10	Beryllium	1.12E-09	4.2E-12	4.3E+00	1.8E-11	8.7E-10
Dibenzo(a,h)anthracene	9.94E-05	1.6E-08	7.3E+00	1.2E-07	Dibenzo(a,h)anthracene	3.14E-05	1.2E-07	7.3E+00	8.5E-07	9.7E-07
Lead	2.65E-06	4.2E-10			Lead	2.21E-06	8.2E-09			
TH-TOTAL	1.45E-07	2.3E-11			TH-TOTAL	1.21E-07	4.5E-10			
2-Methylnaphthalene	3.14E-08	5.0E-12			2-Methylnaphthalene	9.93E-09	3.7E-11			
			Total Pathway:	1.3E-07				Total Pathway:	8.7E-07	
			Total Rad + Chem	1.3E-07				Total Rad + Chem	8.7E-07	*Total:* 1.0E-06

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TABLE B.3.3-21(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	onc'n in Beef (pCi/kg	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	1.97E-06	1.2E-04			NP-237	1.79E-07	2.6E-04			
PU-238	1.15E-08	7.0E-07			PU-238	2.30E-09	3.3E-06			
PU-239/240	3.21E-09	2.0E-07			PU-239/240	6.42E-10	9.2E-07			
RA-226	1.98E-04	1.2E-02			RA-226	3.57E-04	5.1E-01			
RA-228	1.44E-04	8.7E-03			RA-228	2.58E-04	3.7E-01			
SR-90	1.78E-03	1.1E-01			SR-90	8.90E-03	1.3E+01			
TH-228	3.77E-06	2.3E-04			TH-228	3.14E-06	4.5E-03			
TH-230	1.87E-05	1.1E-03			TH-230	1.56E-05	2.2E-02			
TH-232	1.59E-05	9.7E-04			TH-232	1.32E-05	1.9E-02			
U-234	4.19E-04	2.6E-02			U-234	1.26E-03	1.8E+00			
U-235/236	2.92E-05	1.8E-03			U-235/236	8.76E-05	1.3E-01			
U-238	4.30E-04	2.6E-02			U-238	1.29E-03	1.8E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	onc'n in Beef (mg/kg	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	5.71E-05	1.1E-07	3.0E-04	3.5E-04	Arsenic	1.71E-06	7.4E-08	3.0E-04	2.5E-04	6.0E-04
Beryllium	1.25E-06	2.3E-09	5.0E-03	4.6E-07	Beryllium	1.12E-09	4.9E-11	5.0E-03	9.7E-09	4.7E-07
Dibenzo(a,h)anthracene	9.94E-05	1.8E-07			Dibenzo(a,h)anthracene	3.14E-05	1.4E-06			
Lead	2.65E-06	4.9E-09			Lead	2.21E-06	9.6E-08			
TH-TOTAL	1.45E-07	2.7E-10			TH-TOTAL	1.21E-07	5.3E-09			
2-Methylnaphthalene	3.14E-08	5.8E-11			2-Methylnaphthalene	9.93E-09	4.3E-10			
		Total Pathway:		3.5E-04			Total Pathway:		2.5E-04	
		Total Rad + Chem		3.5E-04			Total Rad + Chem		2.5E-04	*Total:* 6.0E-04

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TABLE B.3.3-21(b)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef: Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Ingestion/Milk: Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	Total	Total Dust & Groundwater Affected
NP-237	3.41E-04	2.1E-02	2.2E-10	4.6E-12	NP-237	3.19E-05	4.6E-02	2.2E-10	1.0E-11	1.5E-11	1.5E-11
PU-238			2.2E-10		PU-238			2.2E-10			8.8E-16
PU-239/240			2.3E-10		PU-239/240			2.3E-10			2.6E-16
RA-226			7.8E-10		RA-226			7.8E-10			4.1E-10
RA-228			1.0E-10		RA-228			1.0E-10			3.8E-11
SR-90	6.18E-02	3.8E+00	3.6E-11	1.4E-10	SR-90	3.09E-01	4.4E+02	3.6E-11	1.6E-08	1.6E-08	1.6E-08
TH-228			5.5E-11		TH-228			5.5E-11			2.6E-13
TH-230			1.3E-11		TH-230			1.3E-11			3.0E-13
TH-232			1.7E-10		TH-232			1.7E-10			3.4E-12
U-234	2.74E+01	1.7E+03	1.6E-11	2.7E-08	U-234	8.49E+01	1.2E+05	1.6E-11	1.9E-06	2.0E-06	2.0E-06
U-235/236	1.46E+00	8.9E+01	1.6E-11	1.4E-09	U-235/236	4.53E+00	6.5E+03	1.6E-11	1.0E-07	1.0E-07	1.0E-07
U-238	3.02E+01	1.8E+03	2.8E-11	5.1E-08	U-238	9.36E+01	1.3E+05	2.8E-11	3.7E-06	3.8E-06	3.8E-06
TC-99	6.36E+00	3.9E+02	1.3E-12	5.0E-10	TC-99	7.66E+00	1.1E+04	1.3E-12	1.4E-08	1.5E-08	1.5E-08
			Total Pathway:	8.0E-08				Total Pathway:	5.8E-06		

Chemical Risk

Ingestion/Beef: Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Ingestion/Milk: Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	Total	Total Dust & Groundwater Affected
Arsenic			1.8E+00		Arsenic			1.8E+00			2.7E-08
Beryllium			4.3E+00		Beryllium			4.3E+00			8.7E-10
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			9.7E-07
Lead	1.76E-04	2.8E-08			Lead	1.50E-04	5.6E-07				
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene	1.54E-04	2.5E-08			2-Methylnaphthalene	4.93E-05	1.8E-07				
Tributyl phosphate	2.20E-06	3.5E-10			Tributyl phosphate	7.10E-07	2.6E-09				
U-TOTAL	1.07E-01	1.7E-05			U-TOTAL	3.33E-01	1.2E-03				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	8.0E-08				Total Rad + Chem	5.8E-06	*Total:* 5.9E-06	6.9E-06

TABLE B.3.3-21(b)

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.41E-04	2.1E-02		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	6.18E-02	3.8E+00		
TH-228				
TH-230				
TH-232				
U-234	2.74E+01	1.7E+03		
U-235/236	1.46E+00	8.9E+01		
U-238	3.02E+01	1.8E+03		
TC-99	6.36E+00	3.9E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	3.19E-05	4.6E-02		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.09E-01	4.4E+02		
TH-228				
TH-230				
TH-232				
U-234	8.49E+01	1.2E+05		
U-235/236	4.53E+00	6.5E+03		
U-238	9.36E+01	1.3E+05		
TC-99	7.66E+00	1.1E+04		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.76E-04	3.3E-07		
TH-TOTAL				
2-Methylnaphthalene	1.54E-04	2.9E-07		
Tributyl phosphate	2.20E-06	4.1E-09	5.0E-03	8.1E-07
U-TOTAL	1.07E-01	2.0E-04	3.0E-03	6.6E-02

Total Pathway: 6.6E-02

Total Rad + Chem 6.6E-02

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.50E-04	6.5E-06		
TH-TOTAL				
2-Methylnaphthalene	4.93E-05	2.1E-06		
Tributyl phosphate	7.10E-07	3.1E-08	5.0E-03	6.2E-06
U-TOTAL	3.33E-01	1.4E-02	3.0E-03	4.8E+00

Total Pathway: 4.8E+00

Total Rad + Chem 4.8E+00

	Total	Total Dust & Groundwater Affected
		6.0E-04
		4.7E-07
	7.0E-06	7.0E-06
	4.9E+00	4.9E+00
Total:	4.9E+00	4.9E+00

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TABLE B.3.3-22
INACTIVE FLYASH PILE: SURFACE SOIL
FUTURE ON-PROPERTY FARMER (CT VALUES)
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	7.29E-07	6.2E-03	2.9E-08	1.8E-10	1.8E-10
PU-238	4.54E-07	3.9E-03	3.9E-08	1.5E-10	1.5E-10
PU-239/240	1.18E-07	1.0E-03	3.8E-08	3.8E-11	3.8E-11
RA-226	1.11E-05	9.5E-02	7.0E-09	6.7E-10	6.7E-10
RA-228	1.26E-05	1.1E-01	6.9E-10	7.4E-11	7.4E-11
SR-90	4.88E-06	4.2E-02	6.2E-11	2.6E-12	2.6E-12
TH-228	1.52E-05	1.3E-01	7.8E-08	1.0E-08	1.0E-08
TH-230	1.55E-05	1.3E-01	2.9E-08	3.9E-09	3.9E-09
TH-232	1.31E-05	1.1E-01	1.1E-07	1.2E-08	1.2E-08
U-234	4.85E-05	4.2E-01	2.6E-08	1.1E-08	1.1E-08
U-235/236	3.38E-06	2.9E-02	2.5E-08	7.2E-10	7.2E-10
U-238	4.98E-05	4.3E-01	5.2E-08	2.2E-08	2.2E-08
			Total Pathway:	6.1E-08	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.86E-07	8.9E-10	1.5E+01	1.3E-08	1.3E-08
Beryllium	1.27E-08	6.1E-11	8.4E+00	5.1E-10	5.1E-10
Dibenzo(a,h)anthracene	1.23E-08	5.9E-11	6.1E+00	3.6E-10	3.6E-10
Lead	1.34E-07	6.4E-10			
TH-TOTAL	1.20E-07	5.7E-10			
2-Methylnaphthalene	8.98E-10	4.3E-12			
			Total Pathway:	1.4E-08	

Total Rad + Chem 7.5E-08 *Total:* 7.5E-08

TABLE B.3.3-22
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	7.29E-07	6.2E-03		
PU-238	4.54E-07	3.9E-03		
PU-239/240	1.18E-07	1.0E-03		
RA-226	1.11E-05	9.5E-02		
RA-228	1.26E-05	1.1E-01		
SR-90	4.88E-06	4.2E-02		
TH-228	1.52E-05	1.3E-01		
TH-230	1.55E-05	1.3E-01		
TH-232	1.31E-05	1.1E-01		
U-234	4.85E-05	4.2E-01		
U-235/236	3.38E-06	2.9E-02		
U-238	4.98E-05	4.3E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.86E-07	6.9E-09		
Beryllium	1.27E-08	4.7E-10		
Dibenzo(a,h)anthracene	1.23E-08	4.6E-10		
Lead	1.34E-07	5.0E-09		
TH-TOTAL	1.20E-07	4.5E-09		
2-Methylnaphthalene	8.98E-10	3.3E-11		

Total Pathway:

Total Rad + Chem

Total
Total:

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TABLE B.3.3-23

FUTURE, ON-PROPERTY FARMER FARMER (CT VALUES)

INACTIVE FLYASH PILE: GROUNDWATER

CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.9E-02	5.6E+01	2.2E-10	1.2E-08
SR-90	2.7E-02	8.0E+01	3.6E-11	2.9E-09
TC-99	1.8E+00	5.4E+03	1.3E-12	7.0E-09
U-234	4.7E+02	1.4E+06	1.6E-11	2.2E-05
U-235/236	2.5E+01	7.4E+04	1.6E-11	1.2E-06
U-238	5.2E+02	1.5E+06	2.8E-11	4.3E-05

Total Pathway: 6.6E-05

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
2-Methylnaphthalene	7.2E-04	1.2E-06		
Lead	1.4E-03	2.4E-06		
Tributyl phosphate	1.4E-03	2.4E-06		
U-TOTAL	1.8E+00	3.0E-03		

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
2-Methylnaphthalene	6.3E-06		
Lead	1.3E-05		
Tributyl phosphate	1.3E-05		
U-TOTAL	1.6E-02		

Total Pathway:

Total Rad + Chem 6.6E-05

Total Rad + Chem

TABLE B.3.3-23
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	1.2E-08
	2.9E-09
	7.0E-09
	2.2E-05
	1.2E-06
	4.3E-05

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene	4.1E-07		
Lead	2.3E-11		
Tributyl phosphate	1.8E-07		
U-TOTAL	7.4E-06		

Total Pathway:

Total Rad + Chem *Total:* 6.6E-05

TABLE B.3.3-23
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	1.9E-02	5.6E+01		
SR-90	2.7E-02	8.0E+01		
TC-99	1.8E+00	5.4E+03		
U-234	4.7E+02	1.4E+06		
U-235/236	2.5E+01	7.4E+04		
U-238	5.2E+02	1.5E+06		

Total Pathway:

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Hazard

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene	7.2E-04	9.2E-06		
Lead	1.4E-03	1.8E-05		
Tributyl phosphate	1.4E-03	1.8E-05	5.0E-03	3.7E-03
U-TOTAL	1.8E+00	2.4E-02	3.0E-03	7.9E+00

Total Pathway: 7.9E+00

Total Rad + Chem 7.9E+00

Inhalation/Groundwater

Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene	4.9E-05		
Lead	9.8E-05		
Tributyl phosphate	9.8E-05		
U-TOTAL	1.3E-01		

Total Pathway:

Total Rad + Chem

TABLE B.3.3-23
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene	3.2E-06			
Lead	1.8E-10			
Tributyl phosphate	1.4E-06	4.5E-03	3.1E-04	4.0E-03
U-TOTAL	5.7E-05	1.5E-04	3.8E-01	8.2E+00
Total Pathway:			3.8E-01	
Total Rad + Chem			3.8E-01	*Total:* 8.3E+00

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TABLE B.3.3-24

FUTURE ON-PROPERTY FARMER (CT VALUES)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.60E-07	3.8E-02	2.2E-10	8.4E-12
PU-238	2.22E-07	2.4E-02	2.2E-10	5.2E-12
PU-239/240	5.78E-08	6.1E-03	2.3E-10	1.4E-12
RA-226	5.59E-06	5.9E-01	7.8E-10	4.6E-10
RA-228	6.19E-06	6.5E-01	1.0E-10	6.5E-11
SR-90	7.28E-06	7.7E-01	3.6E-11	2.8E-11
TH-228	7.43E-06	7.9E-01	5.5E-11	4.3E-11
TH-230	7.75E-06	8.2E-01	1.3E-11	1.1E-11
TH-232	6.55E-06	6.9E-01	1.7E-10	1.2E-10
U-234	2.38E-05	2.5E+00	1.6E-11	4.0E-11
U-235/236	1.66E-06	1.8E-01	1.6E-11	2.8E-12
U-238	2.44E-05	2.6E+00	2.8E-11	7.2E-11
			Total Pathway:	8.6E-10

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.60E-07	2.2E-02	2.2E-10	4.7E-12
PU-238	2.22E-07	1.3E-02	2.2E-10	2.9E-12
PU-239/240	5.78E-08	3.5E-03	2.3E-10	7.9E-13
RA-226	5.59E-06	3.3E-01	7.8E-10	2.6E-10
RA-228	6.13E-06	3.7E-01	1.0E-10	3.7E-11
SR-90	7.27E-06	4.3E-01	3.6E-11	1.6E-11
TH-228	7.22E-06	4.3E-01	5.5E-11	2.4E-11
TH-230	7.75E-06	4.6E-01	1.3E-11	6.0E-12
TH-232	6.55E-06	3.9E-01	1.7E-10	6.7E-11
U-234	2.38E-05	1.4E+00	1.6E-11	2.3E-11
U-235/236	1.66E-06	9.9E-02	1.6E-11	1.6E-12
U-238	2.44E-05	1.5E+00	2.8E-11	4.1E-11
			Total Pathway:	4.8E-10

Total
1.3E-11
8.1E-12
2.2E-12
7.2E-10
1.0E-10
4.3E-11
6.7E-11
1.7E-11
1.8E-10
6.3E-11
4.4E-12
1.1E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.12E-04	6.6E-09	1.8E+00	1.2E-08
Beryllium	6.66E-06	3.9E-10	4.3E+00	1.7E-09
Dibenzo(a,h)anthracene	6.15E-06	3.6E-10	7.3E+00	2.7E-09
Lead	6.99E-05	4.1E-09		
TH-TOTAL	6.00E-05	3.5E-09		
2-Methylnaphthalene	1.54E-06	9.1E-11		
			Total Pathway:	1.6E-08
			Total Rad + Chem	1.7E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.12E-04	3.7E-09	1.8E+00	6.6E-09
Beryllium	6.66E-06	2.2E-10	4.3E+00	9.6E-10
Dibenzo(a,h)anthracene	6.11E-06	2.0E-10	7.3E+00	1.5E-09
Lead	6.99E-05	2.3E-09		
TH-TOTAL	6.00E-05	2.0E-09		
2-Methylnaphthalene	1.54E-06	5.1E-11		
			Total Pathway:	9.0E-09
			Total Rad + Chem	9.5E-09

Total	
1.8E-08	
2.7E-09	
4.1E-09	

Total: 2.6E-08

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TABLE B.3.3-24
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237	3.6E-07	3.8E-02			NP-237	3.60E-07	2.2E-02			
PU-238	2.2E-07	2.4E-02			PU-238	2.22E-07	1.3E-02			
PU-239/240	5.8E-08	6.1E-03			PU-239/240	5.78E-08	3.5E-03			
RA-226	5.6E-06	5.9E-01			RA-226	5.59E-06	3.3E-01			
RA-228	6.2E-06	6.5E-01			RA-228	6.13E-06	3.7E-01			
SR-90	7.3E-06	7.7E-01			SR-90	7.27E-06	4.3E-01			
TH-228	7.4E-06	7.9E-01			TH-228	7.22E-06	4.3E-01			
TH-230	7.7E-06	8.2E-01			TH-230	7.75E-06	4.6E-01			
TH-232	6.5E-06	6.9E-01			TH-232	6.55E-06	3.9E-01			
U-234	2.4E-05	2.5E+00			U-234	2.38E-05	1.4E+00			
U-235/236	1.7E-06	1.8E-01			U-235/236	1.66E-06	9.9E-02			
U-238	2.4E-05	2.6E+00			U-238	2.44E-05	1.5E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	1.1E-04	5.2E-08	3.0E-04	1.7E-04	Arsenic	1.12E-04	2.9E-08	3.0E-04	9.7E-05	2.7E-04
Beryllium	6.7E-06	3.1E-09	5.0E-03	6.1E-07	Beryllium	6.66E-06	1.7E-09	5.0E-03	3.5E-07	9.6E-07
Dibenzo(a,h)anthracene	6.1E-06	2.8E-09			Dibenzo(a,h)anthracene	6.11E-06	1.6E-09			
Lead	7.0E-05	3.2E-08			Lead	6.99E-05	1.8E-08			
TH-TOTAL	6.0E-05	2.8E-08			TH-TOTAL	6.00E-05	1.6E-08			
2-Methylnaphthalene	1.5E-06	7.1E-10			2-Methylnaphthalene	1.54E-06	4.0E-10			
		Total Pathway:		1.7E-04			Total Pathway:		9.8E-05	
		Total Rad + Chem		1.7E-04			Total Rad + Chem		9.8E-05	*Total:* 2.7E-04

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TABLE B.3.3-24

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	9.41E-05	1.0E+01	2.2E-10	2.2E-09
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.74E-04	5.0E+01	3.6E-11	1.8E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.30E+00	2.4E+05	1.6E-11	3.9E-06
U-235/236	1.23E-01	1.3E+04	1.6E-11	2.1E-07
U-238	2.53E+00	2.7E+05	2.8E-11	7.5E-06
TC-99	9.50E-03	1.0E+03	1.3E-12	1.3E-09

Total Pathway: 1.2E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk
NP-237	9.41E-05	5.6E+00	2.2E-10	1.2E-09
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.73E-04	2.8E+01	3.6E-11	1.0E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	2.30E+00	1.4E+05	1.6E-11	2.2E-06
U-235/236	1.23E-01	7.3E+03	1.6E-11	1.2E-07
U-238	2.53E+00	1.5E+05	2.8E-11	4.2E-06
TC-99	9.50E-03	5.7E+02	1.3E-12	7.4E-10

Total Pathway: 6.6E-06

	Total	Total Dust & Groundwater Affected
NP-237	3.4E-09	3.4E-09
PU-238		8.1E-12
PU-239/240		2.2E-12
RA-226		7.2E-10
RA-228		1.0E-10
SR-90	2.8E-09	2.9E-09
TH-228		6.7E-11
TH-230		1.7E-11
TH-232		1.8E-10
U-234	6.1E-06	6.1E-06
U-235/236	3.2E-07	3.2E-07
U-238	1.2E-05	1.2E-05
TC-99	2.0E-09	2.0E-09

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	7.58E-03	4.5E-07		
TH-TOTAL				
2-Methylnaphthalene	1.45E-02	8.6E-07		
Tributyl phosphate	7.79E-03	4.6E-07		
U-TOTAL	9.02E+00	5.3E-04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	7.58E-03	2.5E-07		
TH-TOTAL				
2-Methylnaphthalene	1.45E-02	4.8E-07		
Tributyl phosphate	7.79E-03	2.6E-07		
U-TOTAL	9.02E+00	3.0E-04		

Total Pathway:

	Total	Total Dust & Groundwater Affected
Arsenic		1.8E-08
Beryllium		2.7E-09
Dibenzo(a,h)anthracene		4.1E-09
Lead		
TH-TOTAL		
2-Methylnaphthalene		
Tributyl phosphate		
U-TOTAL		

Total Rad + Chem 1.2E-05

Total Rad + Chem 6.6E-06

Total:	1.8E-05	1.8E-05

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TABLE B.3.3-24
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
NP-237	9.4E-05	1.0E+01			NP-237	9.41E-05	5.6E+00				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
					RA-228						
SR-90	4.7E-04	5.0E+01			SR-90	4.73E-04	2.8E+01				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	2.3E+00	2.4E+05			U-234	2.30E+00	1.4E+05				
U-235/236	1.2E-01	1.3E+04			U-235/236	1.23E-01	7.3E+03				
U-238	2.5E+00	2.7E+05			U-238	2.53E+00	1.5E+05				
	9.5E-03	1.0E+03			TC-99	9.50E-03	5.7E+02				
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Arsenic			3.0E-04		Arsenic			3.0E-04			2.7E-04
Beryllium			5.0E-03		Beryllium			5.0E-03			9.6E-07
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Lead	7.6E-03	3.5E-06			Lead	7.58E-03	2.0E-06				
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene	1.4E-02	6.7E-06			2-Methylnaphthalene	1.45E-02	3.8E-06				
Tributyl phosphate	7.8E-03	3.6E-06	5.0E-03	7.2E-04	Tributyl phosphate	7.79E-03	2.0E-06	5.0E-03	1.0E-08	7.2E-04	7.2E-04
U-TOTAL	9.0E+00	4.1E-03	3.0E-03	1.4E+00	U-TOTAL	9.02E+00	2.3E-03	3.0E-03	7.0E-06	1.4E+00	1.4E+00
			Total Pathway:	1.4E+00				Total Pathway:	7.0E-06		
			Total Rad + Chem	1.4E+00				Total Rad + Chem	7.0E-06	*Total:* 1.4E+00	1.4E+00

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TABLE B.3.3-25

FUTURE ON-PROPERTY FARMER (CT VALUES)

INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.97E-06	2.1E-04	2.2E-10	4.6E-14	NP-237	1.79E-07	5.9E-05	2.2E-10	1.3E-14	5.9E-14
PU-238	1.15E-08	1.2E-06	2.2E-10	2.7E-16	PU-238	2.30E-09	7.6E-07	2.2E-10	1.7E-16	4.3E-16
PU-239/240	3.21E-09	3.4E-07	2.3E-10	7.8E-17	PU-239/240	6.42E-10	2.1E-07	2.3E-10	4.9E-17	1.3E-16
RA-226	1.98E-04	2.1E-02	7.8E-10	1.6E-11	RA-226	3.57E-04	1.2E-01	7.8E-10	9.2E-11	1.1E-10
RA-228	1.44E-04	1.5E-02	1.0E-10	1.5E-12	RA-228	2.58E-04	8.6E-02	1.0E-10	8.6E-12	1.0E-11
SR-90	1.78E-03	1.9E-01	3.6E-11	6.7E-12	SR-90	8.90E-03	3.0E+00	3.6E-11	1.1E-10	1.1E-10
TH-228	3.77E-06	4.0E-04	5.5E-11	2.2E-14	TH-228	3.14E-06	1.0E-03	5.5E-11	5.7E-14	7.9E-14
TH-230	1.87E-05	2.0E-03	1.3E-11	2.6E-14	TH-230	1.56E-05	5.2E-03	1.3E-11	6.7E-14	9.3E-14
TH-232	1.59E-05	1.7E-03	1.7E-10	2.8E-13	TH-232	1.32E-05	4.4E-03	1.7E-10	7.5E-13	1.0E-12
U-234	4.19E-04	4.4E-02	1.6E-11	7.1E-13	U-234	1.26E-03	4.2E-01	1.6E-11	6.7E-12	7.4E-12
U-235/236	2.92E-05	3.1E-03	1.6E-11	4.9E-14	U-235/236	8.76E-05	2.9E-02	1.6E-11	4.6E-13	5.1E-13
U-238	4.30E-04	4.5E-02	2.8E-11	1.3E-12	U-238	1.29E-03	4.3E-01	2.8E-11	1.2E-11	1.3E-11
			Total Pathway:	2.7E-11				Total Pathway:	2.3E-10	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	5.71E-05	3.4E-09	1.8E+00	5.9E-09	Arsenic	1.71E-06	3.2E-10	1.8E+00	5.6E-10	6.4E-09
Beryllium	1.25E-06	7.3E-11	4.3E+00	3.2E-10	Beryllium	1.12E-09	2.1E-13	4.3E+00	8.9E-13	3.2E-10
Dibenzo(a,h)anthracene	9.94E-05	5.9E-09	7.3E+00	4.3E-08	Dibenzo(a,h)anthracene	3.14E-05	5.8E-09	7.3E+00	4.3E-08	8.5E-08
Lead	2.65E-06	1.6E-10			Lead	2.21E-06	4.1E-10			
TH-TOTAL	1.45E-07	8.6E-12			TH-TOTAL	1.21E-07	2.2E-11			
2-Methylnaphthalene	3.14E-08	1.8E-12			2-Methylnaphthalene	9.93E-09	1.8E-12			
			Total Pathway:	4.9E-08				Total Pathway:	4.3E-08	
			Total Rad + Chem	4.9E-08				Total Rad + Chem	4.3E-08	*Total:* 9.2E-08

TABLE B.3.3-25

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	2.0E-06	2.1E-04		
PU-238	1.2E-08	1.2E-06		
PU-239/240	3.2E-09	3.4E-07		
RA-226	2.0E-04	2.1E-02		
RA-228	1.4E-04	1.5E-02		
SR-90	1.8E-03	1.9E-01		
TH-228	3.8E-06	4.0E-04		
TH-230	1.9E-05	2.0E-03		
TH-232	1.6E-05	1.7E-03		
U-234	4.2E-04	4.4E-02		
U-235/236	2.9E-05	3.1E-03		
U-238	4.3E-04	4.5E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	1.79E-07	5.9E-05		
PU-238	2.30E-09	7.6E-07		
PU-239/240	6.42E-10	2.1E-07		
RA-226	3.57E-04	1.2E-01		
RA-228	2.58E-04	8.6E-02		
SR-90	8.90E-03	3.0E+00		
TH-228	3.14E-06	1.0E-03		
TH-230	1.56E-05	5.2E-03		
TH-232	1.32E-05	4.4E-03		
U-234	1.26E-03	4.2E-01		
U-235/236	8.76E-05	2.9E-02		
U-238	1.29E-03	4.3E-01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	5.7E-05	2.6E-08	3.0E-04	8.7E-05
Beryllium	1.2E-06	5.7E-10	5.0E-03	1.1E-07
Dibenzo(a,h)anthracene	9.9E-05	4.6E-08		
Lead	2.7E-06	1.2E-09		
TH-TOTAL	1.5E-07	6.7E-11		
2-Methylnaphthalene	3.1E-08	1.4E-11		

Total Pathway: 8.7E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic	1.71E-06	2.5E-09	3.0E-04	8.2E-06
Beryllium	1.12E-09	1.6E-12	5.0E-03	3.2E-10
Dibenzo(a,h)anthracene	3.14E-05	4.5E-08		
Lead	2.21E-06	3.2E-09		
TH-TOTAL	1.21E-07	1.7E-10		
2-Methylnaphthalene	9.93E-09	1.4E-11		

Total Pathway: 8.2E-06

Total Rad + Chem	8.7E-05		
Total Rad + Chem	8.2E-06	*Total:*	9.5E-05

Total

	9.5E-05
	1.1E-07

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TABLE B.3.3-25

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk		
NP-237	3.41E-04	3.6E-02	2.2E-10	7.9E-12	NP-237	3.19E-05	1.1E-02	2.2E-10	2.3E-12	1.0E-11	1.0E-11
PU-238			2.2E-10		PU-238			2.2E-10			4.3E-16
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.3E-16
RA-226			7.8E-10		RA-226			7.8E-10			1.1E-10
RA-228			1.0E-10		RA-228			1.0E-10			1.0E-11
SR-90	6.18E-02	6.5E+00	3.6E-11	2.3E-10	SR-90	3.09E-01	1.0E+02	3.6E-11	3.7E-09	3.9E-09	4.0E-09
TH-228			5.5E-11		TH-228			5.5E-11			7.9E-14
TH-230			1.3E-11		TH-230			1.3E-11			9.3E-14
TH-232			1.7E-10		TH-232			1.7E-10			1.0E-12
U-234	2.74E+01	2.9E+03	1.6E-11	4.6E-08	U-234	8.49E+01	2.8E+04	1.6E-11	4.5E-07	5.0E-07	5.0E-07
U-235/236	1.46E+00	1.5E+02	1.6E-11	2.5E-09	U-235/236	4.53E+00	1.5E+03	1.6E-11	2.4E-08	2.6E-08	2.6E-08
U-238	3.02E+01	3.2E+03	2.8E-11	8.9E-08	U-238	9.36E+01	3.1E+04	2.8E-11	8.7E-07	9.6E-07	9.6E-07
TC-99	6.36E+00	6.7E+02	1.3E-12	8.7E-10	TC-99	7.66E+00	2.5E+03	1.3E-12	3.3E-09	4.2E-09	4.2E-09
		Total Pathway:		1.4E-07			Total Pathway:		1.4E-06		

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic			1.8E+00		Arsenic			1.8E+00		6.4E-09
Beryllium			4.3E+00		Beryllium			4.3E+00		3.2E-10
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		8.5E-08
Lead	1.76E-04	1.0E-08			Lead	1.50E-04	2.8E-08			
TH-TOTAL					TH-TOTAL					
2-Methylnaphthalene	1.54E-04	9.1E-09			2-Methylnaphthalene	4.93E-05	9.1E-09			
Tributyl phosphate	2.20E-06	1.3E-10			Tributyl phosphate	7.10E-07	1.3E-10			
U-TOTAL	1.07E-01	6.3E-06			U-TOTAL	3.33E-01	6.2E-05			
		Total Pathway:					Total Pathway:			
		Total Rad + Chem		1.4E-07			Total Rad + Chem		1.4E-06	*Total:* 1.5E-06 1.6E-06

TABLE B.3.3-25

(continued)

INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.4E-04	3.6E-02		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	6.2E-02	6.5E+00		
TH-228				
TH-230				
TH-232				
U-234	2.7E+01	2.9E+03		
U-235/236	1.5E+00	1.5E+02		
U-238	3.0E+01	3.2E+03		
TC-99	6.4E+00	6.7E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	3.19E-05	1.1E-02		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.09E-01	1.0E+02		
TH-228				
TH-230				
TH-232				
U-234	8.49E+01	2.8E+04		
U-235/236	4.53E+00	1.5E+03		
U-238	9.36E+01	3.1E+04		
TC-99	7.66E+00	2.5E+03		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.8E-04	8.0E-08		
TH-TOTAL				
2-Methylnaphthalene	1.5E-04	7.1E-08		
Tributyl phosphate	2.2E-06	1.0E-09	5.0E-03	2.0E-07
U-TOTAL	1.1E-01	4.9E-05	3.0E-03	1.6E-02

Total Pathway: 1.6E-02

Total Rad + Chem 1.6E-02

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	1.50E-04	2.2E-07		
TH-TOTAL				
2-Methylnaphthalene	4.93E-05	7.1E-08		
Tributyl phosphate	7.10E-07	1.0E-09	5.0E-03	2.0E-07
U-TOTAL	3.33E-01	4.8E-04	3.0E-03	1.6E-01

Total Pathway: 1.6E-01

Total Rad + Chem 1.6E-01

	Total	Total Dust & Groundwater Affected
		9.5E-05
		1.1E-07
	4.1E-07	4.1E-07
	1.8E-01	1.8E-01
Total:	1.8E-01	1.8E-01

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TABLE B.3.3-26(a)
CURRENT/FUTURE, GREAT MIAMI RIVER RECREATIONAL USER, ADULT
INACTIVE FLYASH PILE: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Radiation Risk

Ingestion of Surface Water

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	3.3E-06	9.1E-05	2.2E-10	2.0E-14
PU-238	4.0E-06	1.1E-04	2.2E-10	2.4E-14
PU-239/240	2.9E-07	7.8E-06	2.3E-10	1.8E-15
RA-226	1.8E-06	4.8E-05	7.8E-10	3.8E-14
RA-228	1.8E-06	4.9E-05	1.0E-10	4.9E-15
SR-90	6.9E-07	1.9E-05	3.6E-11	6.8E-16
U-234	8.0E-04	2.2E-02	1.6E-11	3.5E-13
U-235/236	5.0E-05	1.4E-03	1.6E-11	2.2E-14
U-238	8.0E-04	2.2E-02	2.8E-11	6.1E-13
			Total Pathway:	1.1E-12

Dermal Contact/Surface Water

Not Applicable

Total Pathway:

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.32E-08	6.6E-03	2.2E-10	1.4E-12
PU-238	9.98E-08	2.0E-02	2.2E-10	4.3E-12
PU-239/240	7.18E-09	1.4E-03	2.3E-10	3.3E-13
RA-226	8.85E-08	1.7E-02	7.8E-10	1.4E-11
RA-228	8.90E-08	1.8E-02	1.0E-10	1.8E-12
SR-90	2.07E-08	4.1E-03	3.6E-11	1.5E-13
U-234	1.60E-06	3.2E-01	1.6E-11	5.0E-12
U-235/236	9.92E-08	2.0E-02	1.6E-11	3.1E-13
U-238	1.60E-06	3.2E-01	2.8E-11	8.8E-12
			Total Pathway:	3.6E-11

Total

1.5E-12
4.4E-12
3.3E-13
1.4E-11
1.8E-12
1.5E-13
5.4E-12
3.4E-13
9.4E-12

Chemical Risk

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	1.6E-08	2.4E-13	1.8E+00	4.2E-13
Beryllium	7.6E-10	1.2E-14	4.3E+00	5.0E-14
Cadmium	2.4E-08	3.6E-13		
Lead	6.4E-08	9.8E-13		
Nickel	1.1E-08	1.6E-13		
Dibenzo(a,h)anthracene	1.1E-10	1.7E-15	7.3E+00	1.2E-14
U-TOTAL	2.4E-06	3.7E-11		
2-methylnaphthalene	1.5E-08	2.4E-13		
			Total Pathway	4.9E-13

Dermal Contact/Surface Water

Compound	Intake	SF(derm)	Risk
Arsenic	1.1E-13	1.8E+00	2.1E-13
Beryllium	5.4E-15		5.0E-14
Cadmium	1.7E-13		
Lead	1.8E-15		
Nickel	7.6E-14		
Dibenzo(a,h)anthracene			1.2E-14
U-TOTAL	1.7E-11		
2-methylnaphthalene	1.5E-11		
		Total Pathway	2.7E-13

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
Arsenic	7.00E-07	7.7E-11	1.8E+00	1.4E-10
Beryllium	1.45E-08	1.6E-12	4.3E+00	6.9E-12
Cadmium	1.91E-06	2.1E-10		
Lead	3.14E-06	3.5E-10		
Nickel	5.08E-07	5.6E-11		
Dibenzo(a,h)anthracene	1.01E-05	1.1E-09	7.3E+00	8.2E-09
U-TOTAL	4.88E-09	5.4E-13		
2-methylnaphthalene	7.78E-06	8.6E-10		
			Total Pathway:	8.3E-09

1.4E-10	
7.0E-12	
8.2E-09	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem: 1.6E-12

Total Rad + Chem: 2.7E-13

Total Rad + Chem: 8.4E-09 **Total: 8.4E-09**

TABLE B.3.3-26(a)
(continued)

Noncarcinogenic Hazard

Radiation Hazard

Ingestion of Surface Water

Compound	Conc'n (pCi/L	Intake	RfD(o)	Hazard
NP-237	3.32E-06	9.1E-05		
PU-238	3.99E-06	1.1E-04		
PU-239/240	2.87E-07	7.8E-06		
RA-226	1.77E-06	4.8E-05		
RA-228	1.78E-06	4.9E-05		
SR-90	6.90E-07	1.9E-05		
U-234	7.98E-04	2.2E-02		
U-235/236	4.96E-05	1.4E-03		
U-238	7.98E-04	2.2E-02		

Total Pathway

Dermal Contact/Surface Water

Not Applicable

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.32E-08	6.6E-03		
PU-238	9.98E-08	2.0E-02		
PU-239/240	7.18E-09	1.4E-03		
RA-226	8.85E-08	1.7E-02		
RA-228	8.90E-08	1.8E-02		
SR-90	2.07E-08	4.1E-03		
U-234	1.60E-06	3.2E-01		
U-235/236	9.92E-08	2.0E-02		
U-238	1.60E-06	3.2E-01		

Chemical Hazard

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.59E-08	5.7E-13	3.0E-04	1.9E-09
Beryllium	7.64E-10	2.7E-14	5.0E-03	5.4E-12
Cadmium	2.36E-08	8.4E-13	5.0E-04	1.7E-09
Lead	6.40E-08	2.3E-12		
Nickel	1.08E-08	3.8E-13		
Dibenzo(a,h)anthracene	1.09E-10	3.9E-15		
U-TOTAL	2.44E-06	8.7E-11	3.0E-03	2.9E-08
2-methylnaphthalene	1.54E-08	5.5E-13		

Total Pathway 3.3E-08

Dermal Contact/Surface Water

Compound	Intake	RfD(derm	Hazard
Arsenic	2.6E-13	2.9E-04	9.1E-10
Beryllium	1.3E-14	5.0E-05	2.5E-10
Cadmium	3.9E-13	2.5E-05	1.5E-08
Lead	4.2E-15		
Nickel	1.8E-13		
Dibenzo(a,h)anthracene	4.8E-12		
U-TOTAL	4.0E-11	1.5E-04	2.7E-07
2-methylnaphthalene	3.6E-11		

Total Pathway: 2.8E-07

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	RfD(o)	Hazard
Arsenic	7.00E-07	1.8E-10	3.0E-04	6.0E-07
Beryllium	1.45E-08	3.7E-12	5.0E-03	7.5E-10
Cadmium	1.91E-06	4.9E-10	5.0E-04	9.9E-07
Lead	3.14E-06	8.1E-10		
Nickel	5.08E-07	1.3E-10		
Dibenzo(a,h)anthracene	1.01E-05	2.6E-09		
U-TOTAL	4.88E-09	1.3E-12	3.0E-03	4.2E-10
2-methylnaphthalene	7.78E-06	2.0E-09		

Total Pathway: 1.6E-06

Total
6.0E-07
1.0E-09
1.0E-06
3.0E-07

Total: 1.9E-06

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TABLE B.3.3-26(b)

CURRENT/FUTURE GREAT MIAMI RIVER AGRICULTURAL USER

INACTIVE FLYASH PILE: BEEF AND MILK (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.96E-08	1.1E-01	2.2E-10	2.4E-11
PU-238	5.84E-10	1.1E-03	2.2E-10	2.4E-13
PU-239/240	4.22E-11	7.8E-05	2.3E-10	1.8E-14
RA-226	1.76E-07	3.3E-01	7.8E-10	2.5E-10
RA-228	1.32E-07	2.4E-01	1E-10	2.4E-11
SR-90	1.49E-07	2.8E-01	3.6E-11	1.0E-11
U-234	4.66E-05	8.6E+01	1.6E-11	1.4E-09
U-235/236	2.89E-06	5.4E+00	1.6E-11	8.6E-11
U-238	4.66E-05	8.6E+01	2.8E-11	2.4E-09

Total Pathway: 4.2E-09

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
NP-237	5.58E-09	4.1E-05	2.2E-10	9.0E-15
PU-238	1.21E-10	8.9E-07	2.2E-10	2.0E-16
PU-239/240	8.72E-12	6.4E-08	2.3E-10	1.5E-17
RA-226	3.25E-07	2.4E-03	7.8E-10	1.9E-12
RA-228	2.45E-07	1.8E-03	1.0E-10	1.8E-13
SR-90	7.57E-07	5.6E-03	3.6E-11	2.0E-13
U-234	1.44E-04	1.1E+00	1.6E-11	1.7E-11
U-235/236	8.98E-06	6.6E-02	1.6E-11	1.1E-12
U-238	1.44E-04	1.1E+00	2.8E-11	3.0E-11

Total Pathway: 5.0E-11

Total
2.4E-11
2.4E-13
1.8E-14
2.6E-10
2.5E-11
1.0E-11
1.4E-09
8.7E-11
2.4E-09

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.68E-08	2.8E-11	1.8E+00	4.9E-11
Beryllium	3.54E-10	3.7E-13	4.3E+00	1.6E-12
Cadmium	6.58E-07	6.8E-10		
Lead	7.86E-09	8.2E-12		
Nickel	1.82E-10	1.9E-13		
Dibenzo(a,h)anthracene	5.58E-09	5.8E-12	7.3E+00	4.2E-11
U-TOTAL	1.42E-07	1.5E-10		
2-methylnaphthalene	3.32E-09	3.4E-12		

Total Pathway: 9.3E-11

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic	8.14E-10	3.3E-12	1.8E+00	5.9E-12
Beryllium	3.25E-13	1.3E-15	4.3E+00	5.8E-15
Cadmium	1.20E-06	4.9E-09		
Lead	6.71E-09	2.8E-11		
Nickel	5.95E-11	2.4E-13		
Dibenzo(a,h)anthracene	1.82E-09	7.5E-12	7.3E+00	5.5E-11
U-TOTAL	4.42E-07	1.8E-09		
2-methylnaphthalene	1.06E-09	4.3E-12		

Total Pathway: 6.1E-11

Total
5.5E-11
1.6E-12
9.7E-11

Total Rad + Chem 4.3E-09

Total Rad + Chem 1.1E-10 *Total:* 4.4E-09

TABLE B.3.3-26(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	6.0E-08				NP-237	5.58E-09				
PU-238	5.8E-10				PU-238	1.21E-10				
PU-239/240	4.2E-11				PU-239/240	8.72E-12				
RA-226	1.8E-07				RA-226	3.25E-07				
RA-228	1.3E-07				RA-228	2.45E-07				
SR-90	1.5E-07				SR-90	7.57E-07				
U-234	4.7E-05				U-234	1.44E-04				
U-235/236	2.9E-06				U-235/236	8.98E-06				
U-238	4.7E-05				U-238	1.44E-04				
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	
Arsenic	2.7E-08	2.8E-11	3.0E-04	9.3E-08	Arsenic	8.14E-10	3.3E-12	3.0E-04	1.1E-08	1.0E-07
Beryllium	3.5E-10	3.7E-13	5.0E-03	7.3E-11	Beryllium	3.25E-13	1.3E-15	5.0E-03	2.7E-13	7.4E-11
Cadmium	6.6E-07	6.8E-10	5.0E-04	1.4E-06	Cadmium	1.20E-06	4.9E-09	5.0E-04	9.8E-06	1.1E-05
Lead	7.9E-09	8.2E-12			Lead	6.71E-09	2.8E-11			
Nickel	1.8E-10	1.9E-13			Nickel	5.95E-11	2.4E-13			
Dibenzo(a,h)anthracene	5.6E-09	5.8E-12			Dibenzo(a,h)anthracene	1.82E-09	7.5E-12			
U-TOTAL	1.4E-07	1.5E-10	3.0E-03	4.9E-08	U-TOTAL	4.42E-07	1.8E-09	3.0E-03	6.1E-07	6.5E-07
2-methylnaphthalene	3.3E-09	3.4E-12			2-methylnaphthalene	1.06E-09	4.3E-12			
			Total Pathway:	1.5E-06				Total Pathway:	1.0E-05	
			Total Rad + Chem	1.5E-06				Total Rad + Chem	1.0E-05	*Total:* 1.2E-05

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TABLE B.3.3-26(c)

CURRENT/FUTURE GREAT MIAMI AGRICULTURAL USER

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	1.64E-08	3.2E-02	2.2E-10	7.1E-12	NP-237	1.64E-08	1.7E-02	2.2E-10	3.8E-12	1.1E-11
PU-238	1.95E-08	3.8E-02	2.2E-10	8.5E-12	PU-238	1.95E-08	2.0E-02	2.2E-10	4.5E-12	1.3E-11
PU-239/240	1.41E-09	2.8E-03	2.3E-10	6.4E-13	PU-239/240	1.41E-09	1.5E-03	2.3E-10	3.4E-13	9.7E-13
RA-226	8.98E-09	1.8E-02	7.8E-10	1.4E-11	RA-226	8.98E-09	9.4E-03	7.8E-10	7.3E-12	2.1E-11
RA-228	8.75E-09	1.7E-02	1.0E-10	1.7E-12	RA-228	8.66E-09	9.0E-03	1.0E-10	9.0E-13	2.6E-12
SR-90	3.89E-09	7.7E-03	3.6E-11	2.8E-13	SR-90	3.88E-09	4.1E-03	3.6E-11	1.5E-13	4.2E-13
U-234	3.91E-06	7.7E+00	1.6E-11	1.2E-10	U-234	3.91E-06	4.1E+00	1.6E-11	6.5E-11	1.9E-10
U-235/236	2.43E-07	4.8E-01	1.6E-11	7.7E-12	U-235/236	2.43E-07	2.5E-01	1.6E-11	4.1E-12	1.2E-11
U-238	3.91E-06	7.7E+00	2.8E-11	2.2E-10	U-238	3.91E-06	4.1E+00	2.8E-11	1.1E-10	3.3E-10
			Total Pathway:	3.8E-10				Total Pathway:	2.0E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	1.00E-07	1.1E-10	1.8E+00	1.9E-10	Arsenic	1.00E-07	5.9E-11	1.8E+00	1.0E-10	3.0E-10
Beryllium	4.08E-09	4.5E-12	4.3E+00	1.9E-11	Beryllium	4.08E-09	2.4E-12	4.3E+00	1.0E-11	3.0E-11
Cadmium	5.67E-06	6.2E-09			Cadmium	5.67E-06	3.3E-09			
Lead	3.39E-07	3.7E-10			Lead	3.39E-07	2.0E-10			
Nickel	5.29E-08	5.8E-11			Nickel	5.29E-08	3.1E-11			
Dibenzo(a,h)anthrace	5.47E-10	6.0E-13	7.3E+00	4.4E-12	Dibenzo(a,h)anthrace	5.45E-10	3.2E-13	7.3E+00	2.3E-12	6.7E-12
U-TOTAL	1.20E-05	1.3E-08			U-TOTAL	1.20E-05	7.0E-09			
2-methylnaphthalene	3.11E-07	3.4E-10			2-methylnaphthalene	3.11E-07	1.8E-10			
			Total Pathway:	2.2E-10				Total Pathway:	1.2E-10	
			Total Rad + Chem	6.0E-10				Total Rad + Chem	3.2E-10	*Total:* 9.1E-10

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TABLE B.3.3-26(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.6E-08	3.2E-02		
PU-238	2.0E-08	3.8E-02		
PU-239/240	1.4E-09	2.8E-03		
RA-226	9.0E-09	1.8E-02		
RA-228	8.7E-09	1.7E-02		
SR-90	3.9E-09	7.7E-03		
U-234	3.9E-06	7.7E+00		
U-235/236	2.4E-07	4.8E-01		
U-238	3.9E-06	7.7E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.64E-08	1.7E-02		
PU-238	1.95E-08	2.0E-02		
PU-239/240	1.41E-09	1.5E-03		
RA-226	8.98E-09	9.4E-03		
RA-228	8.66E-09	9.0E-03		
SR-90	3.88E-09	4.1E-03		
U-234	3.91E-06	4.1E+00		
U-235/236	2.43E-07	2.5E-01		
U-238	3.91E-06	4.1E+00		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.0E-07	1.1E-10	3.0E-04	3.7E-07
Beryllium	4.1E-09	4.5E-12	5.0E-03	9.0E-10
Cadmium	5.7E-06	6.2E-09	5.0E-04	1.2E-05
Lead	3.4E-07	3.7E-10		
Nickel	5.3E-08	5.8E-11		
Dibenzo(a,h)anthrace	5.5E-10	6.0E-13		
U-TOTAL	1.2E-05	1.3E-08	3.0E-03	4.4E-06
2-methylnaphthalene	3.1E-07	3.4E-10		

Total Pathway: 1.7E-05

Total Rad + Chem 1.7E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.00E-07	5.9E-11	3.0E-04	2.0E-07
Beryllium	4.08E-09	2.4E-12	5.0E-03	4.8E-10
Cadmium	5.67E-06	3.3E-09	5.0E-04	6.6E-06
Lead	3.39E-07	2.0E-10		
Nickel	5.29E-08	3.1E-11		
Dibenzo(a,h)anthrace	5.45E-10	3.2E-13		
U-TOTAL	1.20E-05	7.0E-09	3.0E-03	2.1E-11
2-methylnaphthalene	3.11E-07	1.8E-10		

Total Pathway: 6.8E-06

Total Rad + Chem 6.8E-06

Total	
	5.6E-07
	1.4E-09
	1.9E-05
	4.4E-06
Total:	2.4E-05

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TABLE B.3.3-26(d)
CURRENT/FUTURE GREAT MIAMI RIVER RESIDENTIAL USER, ADULT
INACTIVE FLYASH PILE: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Radiation Risk

Inhalation of Surface Water					Ingestion of Surface Water					Dermal Contact/Surface Water		Total
Compound	Conc'n (pCi/L)	Intake	SF(i)	Risk	Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
					NP-237	3.3E-06	1.6E-01	2.2E-10	3.6E-11			3.6E-11
					PU-238	4.0E-06	2.0E-01	2.2E-10	4.3E-11			4.3E-11
					PU-239/240	2.9E-07	1.4E-02	2.3E-10	3.2E-12			3.2E-12
Not applicable					RA-226	1.8E-06	8.7E-02	7.8E-10	6.8E-11			6.8E-11
					RA-228	1.8E-06	8.7E-02	1.0E-10	8.7E-12	Not Applicable		8.7E-12
					SR-90	6.9E-07	3.4E-02	3.6E-11	1.2E-12			1.2E-12
					U-234	8.0E-04	3.9E+01	1.6E-11	6.3E-10			6.3E-10
					U-235/236	5.0E-05	2.4E+00	1.6E-11	3.9E-11			3.9E-11
					U-238	8.0E-04	3.9E+01	2.8E-11	1.1E-09			1.1E-09
Total Pathway:					Total Pathway				1.9E-09	Total Pathway:		

Inhalation of Surface Water					Ingestion of Surface Water					Dermal Contact/Surface Water				Total
Compound	Conc'n (mg/L)	Intake	SF(i)	Risk	Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	1.6E-08	1.6E-09			Arsenic	1.6E-08	4.4E-10	1.8E+00	7.6E-10	Arsenic	1.3E-12	1.8E+00	2.3E-12	7.6E-10
Beryllium	7.6E-10	7.8E-11			Beryllium	7.6E-10	2.1E-11	4.3E+00	9.0E-11	Beryllium	6.0E-14		9.0E-11	1.8E-10
Cadmium	2.4E-08	2.4E-09			Cadmium	2.4E-08	6.5E-10			Cadmium	1.9E-12			
Lead	6.4E-08	6.6E-09			Lead	6.4E-08	1.8E-09			Lead	2.0E-14			
Nickel	1.1E-08	1.1E-09			Nickel	1.1E-08	3.0E-10			Nickel	8.5E-13			
Dibenzo(a,h)anthracene	1.1E-10	1.1E-11	6.1E+00	6.8E-11	Dibenzo(a,h)anthracene	1.1E-10	3.0E-12	7.3E+00	2.2E-11	Dibenzo(a,h)anthracene			2.2E-11	1.1E-10
U-TOTAL	2.4E-06	2.5E-07			U-TOTAL	2.4E-06	6.7E-08			U-TOTAL	1.9E-10			
2-methylnaphthalene	1.5E-08	1.6E-09			2-methylnaphthalene	1.5E-08	4.2E-10			2-methylnaphthalene	1.7E-10			
		Total Pathway		6.8E-11			Total Pathway		8.7E-10		Total Pathway		1.1E-10	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	6.8E-11	Total Rad + Chem	2.8E-09	Total Rad + Chem	1.1E-10	**Total:**	3.0E-09

TABLE B.3.3-26(d)
(continued)

Noncarcinogenic Hazard

Radiation Hazard

Inhalation of Surface Water

Compound	Conc'n (pCi/L)	Intake	RfD(i)	Hazard
Not applicable				

Total Pathway:

Ingestion of Surface Water

Compound	Conc'n (pCi/L	Intake	RfD(o)	Hazard
NP-237	3.32E-06	1.6E-01		
PU-238	3.99E-06	2.0E-01		
PU-239/240	2.87E-07	1.4E-02		
RA-226	1.77E-06	8.7E-02		
RA-228	1.78E-06	8.7E-02		
SR-90	6.90E-07	3.4E-02		
U-234	7.98E-04	3.9E+01		
U-235/236	4.96E-05	2.4E+00		
U-238	7.98E-04	3.9E+01		

Total Pathway

Dermal Contact/Surface Water

Not Applicable

Chemical Hazard

Inhalation of Surface Water

Compound	Conc'n (mg/L)	Intake	RfD(i)	Hazard
Arsenic	1.6E-08	1.6E-09		
Beryllium	7.6E-10	7.8E-11		
Cadmium	2.4E-08	2.4E-09		
Lead	6.4E-08	6.6E-09		
Nickel	1.1E-08	1.1E-09		
Dibenzo(a,h)anthracene	1.1E-10	1.1E-11		
U-TOTAL	2.4E-06	2.5E-07		
2-methylnaphthalene	1.5E-08	1.6E-09		

Total Pathway

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.59E-08	4.4E-10	3.0E-04	1.5E-06
Beryllium	7.64E-10	2.1E-11	5.0E-03	4.2E-09
Cadmium	2.36E-08	6.5E-10	5.0E-04	1.3E-06
Lead	6.40E-08	1.8E-09		
Nickel	1.08E-08	3.0E-10		
Dibenzo(a,h)anthracene	1.09E-10	3.0E-12		
U-TOTAL	2.44E-06	6.7E-08	3.0E-03	2.2E-05
2-methylnaphthalene	1.54E-08	4.2E-10		

Total Pathway 2.5E-05

Dermal Contact/Surface Water

Compound	Intake	RfD(derm)	Hazard
Arsenic	1.3E-12	2.9E-04	4.4E-09
Beryllium	6.0E-14	5.0E-05	1.2E-09
Cadmium	1.9E-12	2.5E-05	7.4E-08
Lead	2.0E-14		
Nickel	8.5E-13		
Dibenzo(a,h)anthracene	2.3E-11		
U-TOTAL	1.9E-10	1.5E-04	1.3E-06
2-methylnaphthalene	1.7E-10		

Total Pathway: 1.4E-06

			Total
Total Rad + Chem			
Total Rad + Chem	2.5E-05		
Total Rad + Chem	1.4E-06		
		Total:	4.2E-06

Total
1.5E-06
5.4E-09
1.4E-06
1.4E-06

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TABLE B.3.4-2(a)
Constituent of Potential Concern (CPCs)
Solid Waste Landfill: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	L	12	12	6610	18400	–	–	–[e]	–	10898	12931	Y	–	ND[j]	D	N	12931
Arsenic	mg/kg	N	12	12	4.4	8.3	–	–	6.142	6.668	–	–	Y	–	0.0366		Y	6.668
Barium	mg/kg	L	12	12	44.6	101	–	–	–	–	79.10	91.28	Y	–	1830	G	N	91.28
Beryllium	mg/kg	L	12	12	0.46	0.97	–	–	–	–	0.610	0.698	Y	–	0.0149		Y	0.698
Cadmium	mg/kg	U	12	1	0.85	0.85	0.84	1.2	0.542	–	–	–	•[f]	N	27	B	N	0.85[b]
Calcium	mg/kg	N	12	12	6970	112000	–	–	59348	75098	–	–	Y	–	ND	D	N	75098
Chromium	mg/kg	L	12	12	8.2	19.9	–	–	–	–	13.32	15.46	Y	–	135	G	N	15.46
Cobalt	mg/kg	N	12	12	2.8	10.2	–	–	6.542	7.714	–	–	N	N	1620	A, B	N	7.714
Copper	mg/kg	L	12	12	8.6	57.6	–	–	–	–	21.66	29.75	Y	–	999	G	N	29.75
Iron	mg/kg	L	12	12	10600	24000	–	–	–	–	17808	20334	Y	–	ND	D	N	20334
Lead	mg/kg	L	12	12	3.2	33.3	–	–	–	–	11.45	19.01	N	Y	ND		Y	19.01
Magnesium	mg/kg	N	12	12	4330	37900	–	–	19266	24774	–	–	Y	–	262000	D	N	24774
Manganese	mg/kg	L	12	12	349	826	–	–	–	–	541.9	623.4	N	N	3780	A, B	N	623.4
Molybdenum	mg/kg	N	12	10	4.4	7.3	4.6	4.9	5.038	5.818	–	–	Y	–	135	G	N	5.818
Nickel	mg/kg	L	12	12	7.7	23.1	–	–	–	–	14.97	17.62	Y	–	540	G	N	17.62
Potassium	mg/kg	L	12	12	924	1800	–	–	–	–	1329	1547	Y	–	ND	D	N	1547
Selenium	mg/kg	U	12	1	0.42	0.42	0.34	0.53	0.235	–	–	–	N	N	135	G	N	0.420
Silicon	mg/kg	L	12	12	453	996	–	–	–	–	709.2	820.8	N	N	ND	E	N	820.8
Silver	mg/kg	L	12	12	3.1	7.4	–	–	–	–	5.172	5.993	Y	–	135	G	N	5.993
Sodium	mg/kg	N	12	12	65.6	206	–	–	119.0	139.3	–	–	Y	–	ND	D	N	139.3
Vanadium	mg/kg	L	12	12	17.7	46	–	–	–	–	28.46	33.60	Y	–	189	G	N	33.60
Zinc	mg/kg	L	12	12	28.8	83.4	–	–	–	–	50.92	61.34	Y	–	8100	G	N	61.34
CS-137	pci/g	U	12	5	0.071	0.257	0.074	0.121	0.088	–	–	–	N	N	--[g]	A, B	N	0.257
GROSS ALPHA	pci/g	L	12	12	17.4	95	–	–	–	–	48.19	70.21	•	–	ND		N[i]	70.21
GROSS BETA	pci/g	L	12	12	22.1	112	–	–	–	–	50.54	72.81	•	–	ND		N[i]	72.81
NP-237	pci/g	N	8	8	0.045	3.11	–	–	0.475	1.189	–	–	•	–	--		Y	1.189
PU-238	pci/g	L	12	10	0.019	0.9024	0.015	0.026	–	–	0.168	0.772	•	–	--		Y	0.772
PU-239/240	pci/g	L	12	7	0.019	0.126	0.020	0.059	–	–	0.043	0.082	•	–	--		Y	0.082
RA-226	pci/g	L	12	12	0.915	2.26	–	–	–	–	1.207	1.397	N	Y	--		Y	1.397
RA-228	pci/g	L	12	12	0.721	2.99	–	–	–	–	1.314	1.681	N	Y	--		Y	1.681
SR-90	pci/g	N	12	8	0.527	1.44	0.422	0.525	0.725	0.955	–	–	Y	–	--		Y	0.955
TH-228	pci/g	L	9	9	0.482	2.33	–	–	–	–	1.160	1.626	N	Y	--		Y	1.626
TH-230	pci/g	L	9	9	0.939	9.61	–	–	–	–	3.413	6.476	Y	–	--		Y	6.476
TH-232	pci/g	L	9	9	0.601	2.5	–	–	–	–	1.111	1.511	N	Y	--		Y	1.511
TH-TOTAL	mg/kg	L	9	9	5.48	22.8	–	–	–	–	10.13	13.78	•	Y	ND		Y	13.78
U-234	pci/g	L	12	12	1.43	48.9	–	–	–	–	14.40	42.12	Y	–	--		Y	42.12
U-235/236	pci/g	L	12	12	0.076	3.33	–	–	–	–	0.922	2.838	Y	–	--		Y	2.838
U-238	pci/g	L	12	12	2.34	63.8	–	–	–	–	23.66	77.15	Y	–	--		Y	77.15
U-TOTAL	mg/kg	L	12	12	6.86	194	–	–	–	–	73.36	225.2	•	–	81	G	N	225.2
4,4'-DDE	mg/kg	U	12	1	0.012	0.012	0.003	0.004	0.002	–	–	–	–	–	0.188	C	N	0.012
Acenaphthene	mg/kg	U	12	2	0.049	0.12	0.39	0.46	0.187	–	–	–	–	–	1620	G	N	0.12
Anthracene	mg/kg	U	12	2	0.12	0.23	0.39	0.46	0.202	–	–	–	–	–	8100	G	N	0.23
Benzo(a)anthracene	mg/kg	L	12	6	0.055	0.88	0.39	0.46	–	–	0.224511	0.36603	–	–	0.0877		Y	0.366031
Benzo(a)pyrene	mg/kg	L	12	6	0.059	0.76	0.39	0.46	–	–	0.213800	0.34000	–	–	0.00877		Y	0.340008
Benzo(b)fluoranthene	mg/kg	U	12	5	0.064	0.71	0.39	0.46	0.217	–	–	–	–	–	0.0877		Y	0.71
Benzo(g,h,i)perylene	mg/kg	U	12	4	0.082	0.5	0.39	0.46	0.202	–	–	–	–	–	ND		Y	0.5

TABLE B.3.4-2(a)
Constituent of Potential Concern (CPCs)
Solid Waste Landfill: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Benzo(k)fluoranthene	mg/kg	L	12	7	0.042	0.88	0.4	0.46	–	–	0.218299	0.38515	–	–	0.877	G	N	0.385155
bis(2-Ethylhexyl) phthalate	mg/kg	U	12	4	0.04	0.048	0.39	0.46	0.155	–	–	–	–	–	4.57	G	N	0.048
Carbazole	mg/kg	U	12	1	0.077	0.077	0.39	0.46	0.196	–	–	–	–	–	3.2	G	N	0.077
Chrysene	mg/kg	L	12	8	0.045	1.1	0.4	0.46	–	–	0.227483	0.45289	–	–	8.77	G	N	0.452895
Di-n-butyl phthalate	mg/kg	U	12	1	0.055	0.055	0.39	0.46	0.193	–	–	–	–	–	2700	G	N	0.055
Dibenzo(a,h)anthracene	mg/kg	U	12	2	0.056	0.2	0.39	0.46	0.194	–	–	–	–	–	0.00877		Y	0.2
Dibenzofuran	mg/kg	U	12	1	0.056	0.056	0.39	0.46	0.194	–	–	–	–	–	108	G	N	0.056
Fluoranthene	mg/kg	L	12	8	0.057	1.9	0.4	0.46	–	–	0.336293	0.69121	–	–	1080	G	N	0.691217
Fluorene	mg/kg	U	12	2	0.056	0.1	0.39	0.46	0.185	–	–	–	–	–	1080	G	N	0.1
Indeno(1,2,3-cd)pyrene	mg/kg	U	12	5	0.046	0.48	0.39	0.46	0.186	–	–	–	–	–	0.0877		Y	0.48
Phenanthrene	mg/kg	L	12	7	0.059	1.5	0.4	0.46	–	–	0.279596	0.53119	–	–	0		Y	0.531193
Pyrene	mg/kg	L	12	9	0.049	2.1	0.4	0.42	–	–	0.348901	0.85175	–	–	810	G	N	0.851751
2-Butanone	mg/kg	U	12	1	0.001	0.001	0.011	0.014	0.005	–	–	–	–	–	16200	G	N	0.001
Acetone	mg/kg	U	12	4	0.001	0.005	0.011	0.014	0.005	–	–	–	–	–	2700	G	N	0.005
Bromomethane	mg/kg	U	12	1	0.002	0.002	0.011	0.014	0.005	–	–	–	–	–	37.8	G	N	0.002
Chloromethane	mg/kg	U	12	1	0.002	0.002	0.011	0.014	0.005	–	–	–	–	–	4.92	G	N	0.002

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Freq.: 1/12 vs. 6/29 Back., but SQLs higher than most Back Hits!
[i] Quantitative risk assessment not possible; qualitative use only.
[j] No data available to calculate EPA RAGs, Part B screening value.
[k] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

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TABLE B.3.4-2(b)
Constituents of Potential Concern (CPCs)
Solid Waste Landfill: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	N	53	52	748	25200	5800	5800	10172.038	11238.153	–[e]	–	Y	–	ND[g]	D	N	11238.153
Antimony	mg/kg	U	48	11	3.8	27.3	0.11	3.85	4.086	–	–	–	[f]	–	10.8		Y	22.000 j
Arsenic	mg/kg	U	53	53	2.2	15.4	–	–	6.772	–	–	–	Y	–	0.0366		Y	13.800 j
Barium	mg/kg	L	53	53	16.7	251	–	–	–	–	93.755	107.907	Y	–	1890	G	N	107.907
Beryllium	mg/kg	L	53	48	0.19	1.8	0.175	0.23	–	–	0.893	1.075	Y	–	0.0149		Y	1.075
Boron	mg/kg	L	11	8	7.2	32.8	11.05	12.8	–	–	20.425	31.133	N	N	2430	A, B	N	31.133
Cadmium	mg/kg	L	53	35	0.48	6.5	0.22	0.6	–	–	1.325	1.691	Y	–	27	G	N	1.691
Calcium	mg/kg	N	53	53	4500	151000	–	–	75471.132	83861.579	–	–	N	–	ND	A	N	83861.579
Chromium	mg/kg	L	53	53	4	51.8	–	–	–	–	17.625	20.136	Y	–	135	G	N	20.136
Cobalt	mg/kg	L	53	52	2.4	26	1.05	1.05	–	–	10.127	11.800	N	–	1620	A	N	11.800
Copper	mg/kg	U	53	53	4.2	41.5			19.170	–	–	–	Y	–	999	G	N	29.000 j
Cyanide	mg/kg	U	47	5	0.14	1	0.055	0.108	0.110	–	–	–	•	–	540	G	N	0.500 j
Iron	mg/kg	U	53	53	3350	42600	–	–	19980.566	–	–	–	N	–	ND	A	N	36400.000 j
Lead	mg/kg	U	53	53	3.1	147	–	–	15.038	–	–	–	Y	–	ND		Y	28.300 j
Magnesium	mg/kg	N	53	53	3320	63400	–	–	22605.472	25125.004	–	–	N	–	262000	A	N	25125.004
Manganese	mg/kg	U	53	53	115	1690	–	–	544.377	–	–	–	N	–	3780	A	N	1130.000 j
Mercury	mg/kg	U	53	1	0.24	0.24	0.045	0.065	0.059	–	–	–	•	–	8.1	G	N	0.240
Molybdenum	mg/kg	L	53	43	0.86	29.3	0.65	1.4	–	–	6.956	10.081	Y	–	135	G	N	10.081
Nickel	mg/kg	U	53	52	4.4	47.1	2.05	2.05	21.075	–	–	–	N	–	540	G	N	41.000 j
Potassium	mg/kg	L	53	53	550	2480	–	–	–	–	1432.757	1553.278	Y	–	ND	D	N	1553.278
Selenium	mg/kg	U	53	2	0.48	0.54	0.11	0.365	0.197	–	–	–	•	–	135	G	N	0.480 j
Silicon	mg/kg	L	51	51	132	2620	–	–	–	–	813.318	921.657	N	–	ND	A	N	921.657
Silver	mg/kg	U	53	29	0.43	19.7	0.215	1.3	4.546	–	–	–	N	–	135	A	N	15.500 j
Sodium	mg/kg	U	53	53	30	342	–	–	167.015	–	–	–	Y	–	ND	D	N	309.000 j
Thallium	mg/kg	U	53	12	0.23	12.5	0.11	1.1	0.480	–	–	–	•	–	1.89	G	N	0.600 j
Vanadium	mg/kg	L	53	52	6.7	68.8	16.05	16.05	–	–	26.769	29.656	Y	–	189	G	N	29.656
Zinc	mg/kg	N	53	53	10.3	108	–	–	51.155	54.926	–	–	N	–	8100	A	N	54.926
CS-137	pci/g	U	57	6	0.091	0.522	0.031	0.1	0.088	–	–	–	•	Y	--[i]		Y	0.250 j
GROSS ALPHA	pci/g	U	35	34	7.63	2532	4.905	4.905	104.498	–	–	–	•	–	ND		N[h]	178.000 j
GROSS BETA	pci/g	U	35	35	16.1	1220	–	–	77.951	–	–	–	•	–	ND		N[h]	225.000 j
NP-237	pci/g	U	46	25	0.047	1.67	0.3	0.5	0.273	–	–	–	•	–	--		Y	0.351 j
PB-210	pci/g	U	4	3	0.68	1.03	0.2	0.2	0.663	–	–	–	•	Y	--		Y	1.030
PU-238	pci/g	U	57	28	0.014	0.433	0.005	0.5	0.169	–	–	–	•	–	--		Y	0.328 j
PU-239/240	pci/g	U	57	23	0.014	1.67	0.005	0.5	0.211	–	–	–	•	–	--		Y	0.680 j
RA-224	pci/g	U	4	4	1.11	2.14	–	–	1.495	–	–	–	•	Y	--		Y	2.140
RA-226	pci/g	U	57	55	0.38	113	0.15	0.15	2.976	–	–	–	Y	–	--		Y	1.550 j
RA-228	pci/g	U	57	54	0.6	6.65	0.25	0.3	1.174	–	–	–	Y	–	--		Y	2.560 j
SR-90	pci/g	U	53	15	0.195	3.09	0.071	0.45	0.443	–	–	–	•	Y	--		Y	1.580 j
TC-99	pci/g	U	52	3	0.754	5.13	0.142	0.45	0.406	–	–	–	•	Y	--		Y	0.754 j
TH-228	pci/g	U	52	51	0.584	9.36	0.3	0.3	1.423	–	–	–	Y	–	--		Y	3.390 j
TH-230	pci/g	U	52	50	0.69	720	0.3	0.3	16.212	–	–	–	Y	–	--		Y	12.300 j
TH-232	pci/g	U	49	43	0.489	8.22	0.3	0.5	1.195	–	–	–	N	–	--		Y	3.590 j
TH-TOTAL	mg/kg	U	45	45	2.65	75.6	–	–	11.592	–	–	–	•	Y	ND		Y	32.400 j
U-234	pci/g	U	58	55	0.651	553	0.3	0.3	23.449	–	–	–	Y	–	--		Y	97.000 j
U-235	pci/g	U	4	2	0.27	1.89	0.15	0.2	0.628	–	–	–	•	–	--		Y	1.890
U-235/236	pci/g	U	58	43	0.015	28.9	0.015	0.3	1.586	–	–	–	Y	–	--		Y	8.040 j
U-238	pci/g	U	58	56	0.731	577	–	–	33.367	–	–	–	Y	–	--		Y	170.000 j
U-TOTAL	mg/kg	U	53	53	2.49	1770	–	–	102.637	–	–	–	•	–	81		Y	446.000 j
2-Chlorophenol	mg/kg	U	51	1	0.049	0.049	0.165	9.5	0.417039	–	–	–	–	–	135	G	N	0.049
2-Methylnaphthalene	mg/kg	U	50	5	0.093	46	0.18	1.95	1.1479	–	–	–	–	–	ND		Y	0.1 j
4-Chloro-3-methylphenol	mg/kg	U	51	1	0.055	0.055	0.18	9.5	0.417450	–	–	–	–	–	ND	C	N	0.055
4-Methylphenol	mg/kg	U	50	1	0.14	0.14	0.18	9.5	0.4235	–	–	–	–	–	0.016	C	N	0.14
Acenaphthene	mg/kg	U	52	15	0.047	140	0.125	0.42	3.001519	–	–	–	–	–	1620	G	N	0.84 j

TABLE B.3.4-2(b)
Constituents of Potential Concern (CPCs)
Solid Waste Landfill: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Blimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Acenaphthylene	mg/kg	U	50	1	2.5	2.5	0.18	1.95	0.2847	–	–	–	–	–	1620	C	N	2.5
Anthracene	mg/kg	U	51	18	0.07	250	0.18	0.22	5.305294	–	–	–	–	–	8100	G	N	1 j
Benzo(a)anthracene	mg/kg	U	52	25	0.043	310	0.18	0.22	6.722115	–	–	–	–	–	0.0877		Y	7.5 j
Benzo(a)pyrene	mg/kg	U	52	22	0.047	260	0.18	0.22	5.661442	–	–	–	–	–	0.00877		Y	8.2 j
Benzo(b)fluoranthene	mg/kg	U	52	24	0.049	220	0.18	1.95	4.866076	–	–	–	–	–	0.0877		Y	1.5 j
Benzo(g,h,i)perylene	mg/kg	U	51	18	0.064	150	0.18	0.22	3.260784	–	–	–	–	–	ND		Y	0.49 j
Benzo(k)fluoranthene	mg/kg	U	51	16	0.056	140	0.18	0.38	3.466725	–	–	–	–	–	0.877	G	N	0.74 j
Carbazole	mg/kg	U	37	11	0.058	89	0.18	0.38	2.692243	–	–	–	–	–	3.2		Y	4.2 j
Chrysene	mg/kg	U	52	25	0.047	310	0.18	0.22	6.7	–	–	–	–	–	8.77	G	N	5.6 j
Di-n-butyl phthalate	mg/kg	U	50	3	0.071	0.17	0.18	9.5	0.41562	–	–	–	–	–	2700	G	N	0.071 j
Di-n-octyl phthalate	mg/kg	U	50	1	0.055	0.055	0.18	9.5	0.4219	–	–	–	–	–	540	G	N	0.055
Dibenzo(a,h)anthracene	mg/kg	U	51	15	0.04	79	0.18	0.38	1.779823	–	–	–	–	–	0.00877		Y	0.25 j
Dibenzofuran	mg/kg	U	50	11	0.038	120	0.18	0.42	2.65164	–	–	–	–	–	108	G	N	0.34 j
Diethyl phthalate	mg/kg	U	52	3	0.045	0.75	0.18	9.5	0.432788	–	–	–	–	–	21600	G	N	0.045 j
Fluoranthene	mg/kg	U	52	27	0.046	790	0.18	0.22	16.84363	–	–	–	–	–	1080	G	N	12 j
Fluorene	mg/kg	U	51	13	0.046	180	0.18	0.42	3.853274	–	–	–	–	–	1080	G	N	0.64 j
Indeno(1,2,3-cd)pyrene	mg/kg	U	51	20	0.045	150	0.18	0.22	3.385647	–	–	–	–	–	0.0877		Y	5.5 j
Naphthalene	mg/kg	U	50	9	0.041	96	0.18	0.42	2.14312	–	–	–	–	–	1080	G	N	0.32 j
Phenanthrene	mg/kg	U	52	26	0.053	900	0.18	0.22	18.752	–	–	–	–	–	ND		Y	4.8 j
Phenol	mg/kg	U	51	1	0.061	0.061	0.18	9.5	0.417568	–	–	–	–	–	16200	G	N	0.061
Pyrene	mg/kg	U	52	28	0.044	610	0.18	0.22	13.10778	–	–	–	–	–	810	G	N	12 j
bis(2-Ethylhexyl) phthalate	mg/kg	U	50	25	0.04	3.2	0.18	9.5	0.7371	–	–	–	–	–	4.57	G	N	1.7 j
1,1-Dichloroethane	mg/kg	U	53	4	0.001	0.13	0.002	0.007	0.008462	–	–	–	–	–	2700	G	N	0.016 j
1,2-Dichloroethane	mg/kg	U	53	1	0.006	0.006	0.002	0.007	0.005018	–	–	–	–	–	0.703	G	N	0.006
1,2-Dichloroethene	mg/kg	U	52	4	0.002	0.012	0.002	0.006	0.005	–	–	–	–	–	243	G	N	0.002 j
1,4-Dioxane	mg/kg	U	2	2	0.066	12.9	0	0	6.483	–	–	–	–	–	ND		Y	12.9
2-Butanone	mg/kg	U	47	3	0.003	0.11	0.001	0.006	0.008042	–	–	–	–	–	16200	G	N	0.003 j
2-Hexanone	mg/kg	U	52	3	0.001	0.002	0.005	0.007	0.005596	–	–	–	–	–	1080	G	N	0.001 j
4-Methyl-2-pentanone	mg/kg	U	52	4	0.001	0.02	0.005	0.006	0.005855	–	–	–	–	–	1350	G	N	0.001 j
Acetone	mg/kg	U	44	9	0.006	0.088	0.005	0.028	0.011193	–	–	–	–	–	2700	G	N	0.039 j
Benzene	mg/kg	U	53	2	0.003	0.004	0.002	0.006	0.004858	–	–	–	–	–	2.21	G	N	0.003 j
Carbon disulfide	mg/kg	U	53	1	0.002	0.002	0.002	0.007	0.004896	–	–	–	–	–	2700	C	N	0.002
Chlorobenzene	mg/kg	U	53	2	0.002	0.006	0.002	0.007	0.005	–	–	–	–	–	540	G	N	0.002 j
Chloromethane	mg/kg	U	53	1	0.006	0.006	0.005	0.007	0.005858	–	–	–	–	–	4.92	G	N	0.006
Dichlorodifluoromethane	mg/kg	U	1	1	0.576	0.576	0	0	0.576	–	–	–	–	–	5400	C	N	0.576
Ethylbenzene	mg/kg	U	53	5	0.002	0.076	0.002	0.006	0.006679	–	–	–	–	–	2700	G	N	0.015 j
Methylene chloride	mg/kg	U	53	5	0.006	0.013	0.002	0.013	0.0065	–	–	–	–	–	8.53	G	N	0.006 j
Pyridine	mg/kg	U	3	1	0.003	0.003	0.012	0.205	0.073633	–	–	–	–	–	270	C	N	0.003
Styrene	mg/kg	U	53	1	0.002	0.002	0.002	0.007	0.004943	–	–	–	–	–	2.13	C	N	0.002
Tetrachloroethene	mg/kg	U	53	3	0.001	0.03	0.002	0.007	0.005320	–	–	–	–	–	1.23	G	N	0.001 j
Toluene	mg/kg	U	53	19	0.001	0.054	0.001	0.006	0.005056	–	–	–	–	–	5400	G	N	0.008 j
Trichlorofluoromethane	mg/kg	U	5	1	0.84	0.84	0.003	0.006	0.171594	–	–	–	–	–	8100	C	N	0.84
Vinyl chloride	mg/kg	U	53	1	0.002	0.002	0.005	0.007	0.005801	–	–	–	–	–	0.0337	C	N	0.002
Xylenes, Total	mg/kg	U	53	5	0.001	0.26	0.002	0.006	0.012716	–	–	–	–	–	54000	G	N	0.054 j
Sulfide	mg/kg	N	6	6	0.007	0.0127	–	–	0.010461	0.012107	–	–	–	–	ND	F	N	0.012107
Total Organic Carbon	mg/kg	L	6	6	6.02	27.071	–	–	–	–	14.1074647	30.08623	–	–	ND	F	N	27.071
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	mg/kg	U	19	1	0.000	0.00038	0.000	0.000	0.000047	–	–	–	–	–	0.0000427	C	N	0.00038
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	U	19	1	0.000	0.00007	0.000	0.000	0.000024	–	–	–	–	–	0.0000427	C	N	0.000073
Heptachlorodibenzo-p-dioxin	mg/kg	U	19	2	0.000	0.0009	0.000	0.000	0.000104	–	–	–	–	–	0.0000427		Y	0.0009
Heptachlorodibenzofuran	mg/kg	U	19	1	0.000	0.00025	0.000	0.000	0.000047	–	–	–	–	–	0.0000427		Y	0.00025
Octachlorodibenzo-p-dioxin	mg/kg	L	19	18	0.000	0.0137	0.000	0.000	–	–	0.00373899	0.026340	–	–	0.000427		Y	0.0137
4,4'-DDD	mg/kg	U	52	3	0.004	0.005	0.001	0.155	0.010362	–	–	–	–	–	0.267	G	N	0.0043 j
Aroclor-1254	mg/kg	U	53	2	0.048	0.15	0.018	1.55	0.102179	–	–	–	–	–	0.00831		Y	0.048 j

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TABLE B.3.4–2(b)
Constituents of Potential Concern (CPCs)
Solid Waste Landfill: Subsurface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC–1[b]	CPC–2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aroclor–1260	mg/kg	U	53	5	0.026	0.61	0.018	1.55	0.116132	–	–	–	–	–	0.00831		Y	0.077 j
Dieldrin	mg/kg	U	52	1	0.013	0.013	0.001	0.155	0.010420	–	–	–	–	–	0.004	C	N	0.013
Endosulfan II	mg/kg	U	53	1	0.006	0.0062	0.001	0.155	0.010130	–	–	–	–	–	1.35	C	N	0.0062
Endosulfan sulfate	mg/kg	U	53	3	0.006	0.01	0.001	0.155	0.010423	–	–	–	–	–	ND		Y	0.0062 j
Endrin aldehyde	mg/kg	U	37	1	0.18	0.18	0.001	0.002	0.006763	–	–	–	–	–	ND	C	N	0.18
Endrin ketone	mg/kg	U	53	2	0.005	0.0071	0.001	0.155	0.010216	–	–	–	–	–	8.1	G	N	0.0057 j

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[j] Non–parametric 95th percentiles were used in lieu of 95th UCLs for these Undefined distributions.
[k] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B.3.4–2(c)
Constituents of Potential Concern (CPCs)
Solid Waste Landfill: Perched Water – 1000 Series Wells

Parameter	Units	Dist.	Samp.	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL (N)	Est.Mean	UCL (L)	CPC 1[b]	CPC 2[c]	EPA RAGs[a] Residential Tap Water (mg/L; pCi/L)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/l	U	6	5	0.216	53.2	0.0151	0.0151	9.707	–[e]	–	–	*[f]	*	ND[g]	D	N	53.200
Arsenic	mg/l	L	6	4	0.0011	0.0044	0.0005	0.001	–	–	0.002	0.006	*	*	0.00000015		Y	0.004
Barium	mg/l	L	6	6	0.0425	0.466	–	–	–	–	0.144	0.591	*	*	0.256		Y	0.466
Beryllium	mg/l	U	6	1	0.0022	0.0022	0.00043	0.001	0.001	–	–	–	*	*	0.00000024		Y	0.002
Cadmium	mg/l	U	6	2	0.0032	0.0033	0.001	0.0025	0.002	–	–	–	*	*	0.00000036		Y	0.003
Calcium	mg/l	L	6	6	91.6	398	–	–	–	–	178.125	353.083	*	*	ND	D	N	353.083
Chromium	mg/l	U	6	1	0.0583	0.0583	0.002	0.005	0.012	–	–	–	*	*	0.00000005		Y	0.058
Cobalt	mg/l	U	6	2	0.0085	0.0256	0.0015	0.005	0.007	–	–	–	*	*	0.219		Y	0.026
Copper	mg/l	U	6	1	0.0705	0.0705	0.0011	0.00645	0.015	–	–	–	*	*	0.135	G	N	0.071
Iron	mg/l	U	6	4	0.524	75	0.01	0.052	14.271	–	–	–	*	*	ND	D	N	75.000
Lead	mg/l	U	6	2	0.001	0.0314	0.0005	0.0021	0.006	–	–	–	*	*	ND		Y	0.031
Magnesium	mg/l	N	6	6	33.6	130	–	–	76.433	103.089	–	–	*	*	35.40	D	N	103.089
Manganese	mg/l	U	6	6	0.0448	1.9	–	–	0.518	–	–	–	*	*	0.511		Y	1.900
Molybdenum	mg/l	U	6	3	0.0141	0.026	0.00265	0.005	0.012	–	–	–	*	*	0.0182		Y	0.026
Nickel	mg/l	U	6	3	0.0044	0.118	0.0015	0.01045	0.035	–	–	–	*	*	0.00000276		Y	0.118
Potassium	mg/l	L	6	6	1.33	15.4	–	–	–	–	4.663	22.449	*	*	ND	D	N	15.400
Silicon	mg/l	L	6	6	6.36	72.1	–	–	–	–	18.991	95.165	*	*	ND		Y	72.100
Silver	mg/l	U	6	1	0.0201	0.0201	0.001	0.005	0.005	–	–	–	*	*	0.0182		Y	0.020
Sodium	mg/l	N	6	6	8.42	17.3	–	–	13.203	15.833	–	–	*	*	ND	D	N	15.833
Vanadium	mg/l	U	6	1	0.118	0.118	0.0012	0.005	0.023	–	–	–	*	*	0.0255		Y	0.118
Zinc	mg/l	U	6	3	0.0194	0.212	0.00175	0.00275	0.045	–	–	–	*	*	1.090	G	N	0.212
GROSS ALPHA	pci/l	U	6	1	25.6	25.6	3.585	46.05	18.870	–	–	–	*	*	ND		N[i]	25.600
GROSS BETA	pci/l	U	6	3	13.3	178	2.475	3.77	44.113	–	–	–	*	*	ND		N[i]	178.000
NP–237	pci/l	U	11	2	0.3	1.94	0.1	0.5	0.540	–	–	–	*	Y	--[h]		Y	1.940
PU–238	pci/l	U	13	3	0.144	0.67	0.0345	0.5	0.321	–	–	–	N	Y	--		Y	0.670
RA–226	pci/l	U	13	3	0.193	5.11	0.08	0.5	0.729	–	–	–	N	Y	--		Y	5.110
RA–228	pci/l	U	13	1	3.72	3.72	0.67	1.5	1.366	–	–	–	N	N	--	A, B	N	3.720
SR–90	pci/l	U	12	2	0.9	1.35	0.372	2.5	1.410	–	–	–	N	Y	--		Y	1.350
TH–228	pci/l	U	13	2	0.566	14	0.1	0.5	1.407	–	–	–	N	Y	--		Y	14.000
TH–230	pci/l	U	13	4	0.26	13.8	0.1	0.5	1.453	–	–	–	N	Y	--		Y	13.800
TH–232	pci/l	U	13	2	0.654	11.5	0.047	0.5	1.207	–	–	–	N	Y	--		Y	11.500
TH–TOTAL	mg/l	U	12	2	0.00596	0.104	0.00043	0.0025	0.010	–	–	–	N	Y	ND		Y	0.104
U–234	pci/l	L	13	11	1.1	12	0.5	0.5	–	–	3.027	6.112	Y	Y	--		Y	6.112
U–235/236	pci/l	U	13	3	0.208	0.432	0.03	0.5	0.343	–	–	–	N	Y	--		Y	0.432
U–238	pci/l	U	13	12	0.67	15.2	0.5	0.5	3.081	–	–	–	Y	Y	--		Y	15.200
U–TOTAL	mg/l	L	13	13	0.002	0.0558	–	–	–	–	0.008	0.017	Y	Y	0.0109		Y	0.017[f]
1,2–Dichloroethene	mg/l	U	5	1	0.016	0.016	0.0025	0.005	0.007	–	–	–	*	*	0.0328	G	N	0.016
Ammonia	mg/l	U	13	7	0.11	0.3	0.05	0.05	0.130	–	–	–	*	N	0.0278	B	N	0.300
Chloride	mg/l	N	14	13	2	27	1	1	11.392	15.291	–	–	*	N	ND	B	N	15.291
Fluoride	mg/l	L	14	14	0.19	1.25	–	–	–	–	0.577	0.735	*	N	0.219	B	N	0.735
Nitrate	mg/l	L	9	7	0.1	0.93	0.05	0.05	–	–	0.411	1.675	*	Y	5.840	F	N	0.930
Phenols	mg/l	U	12	3	0.02	0.02	0.005	0.005	0.009	–	–	–	*	*	ND	F	N	0.020

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TABLE B.3.4-2(c)
Constituents of Potential Concern (CPCs)
Solid Waste Landfill: Perched Water – 1000 Series Wells

Parameter	Units	Dist.	Samp.	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL (N)	Est.Mean	UCL (L)	CPC 1[b]	CPC 2[c]	EPA RAGs[a] Residential Tap Water (mg/L; pCi/L)	Reason for Elimin.[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Phosphorus	mg/l	U	10	9	0.022	4.9	0.025	0.025	1.318	–	–	–	*	Y	ND	F	N	4.900
Sulfate	mg/l	N	14	14	50.3	296.2	–	–	137.907	170.682	–	–	*	Y	ND	F	N	170.682
Sulfide	mg/l	U	5	1	7.87	7.87	0.25	0.25	1.774	–	–	–	*	*	ND	F	N	7.870

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if c term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] – Not applicable
[f] Insufficient toxicological data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[j] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	1.19E+00		2.2E-10	2.9E-08	4.3E-07				
PU-238	7.72E-01		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	8.20E-02		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.40E+00		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.68E+00		1.0E-10	6.9E-10	2.9E-06				
SR-90	9.55E-01		3.6E-11	6.2E-11	0.0E+00				
TH-228	1.63E+00		5.5E-11	7.8E-08	5.6E-06				
TH-230	6.48E+00		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.51E+00		1.7E-10	1.1E-07	8.5E-06				
U-234	4.21E+01		1.6E-11	2.6E-08	3.0E-11				
U-235/236	2.84E+00		1.6E-11	2.5E-08	2.4E-07				
U-238	7.72E+01		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	6.67E+00	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	3.66E-01		7.30E-01	6.10E-01					
Benzo(a)pyrene	3.40E-01		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	7.10E-01		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	5.00E-01	3.00E-01							
Beryllium	6.98E-01	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	1.90E+01	1.00E-02							
Dibenzo(a,h)anthracen	2.00E-01		7.30E+00	6.10E+00					
Indeno(1,2,3-cd)pyren	4.80E-01		7.30E-01	6.10E-01					
TH-TOTAL	1.38E+01	1.00E-02							
Phenanthrene	5.31E-01	3.00E-01							

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TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

SURFACE WATER (non-GMR)									
	Current and Future								
Contaminant	onc'n (pCi/L	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	5.25E-01		2.2E-10	2.9E-08	4.3E-07				
RA-226	4.86E-02		7.8E-10	7.0E-09	6.0E-06				
RA-228	5.85E-02		1.0E-10	6.9E-10	2.9E-06				
SR-90	2.30E+00		3.6E-11	6.2E-11	0.0E+00				
U-234	1.36E+01		1.6E-11	2.6E-08	3.0E-11				
U-235/236	9.14E-01		1.6E-11	2.5E-08	2.4E-07				
U-238	2.50E+01		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	8.09E-04	1.00E-03	1.75E+00			1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	3.38E-06	8.10E-01	7.30E-01	6.10E-01					
Benzo(a)pyrene	1.31E-06	1.20E+00	7.30E+00	6.10E+00					
Benzo(g,h,i)perylene	5.69E-07	5.37E+00							
Beryllium	1.30E-05	1.00E-03	4.3				5.00E-03		5.00E-05
Dibenzo(a,h)anthracene	7.90E-07	2.70E+00	7.30E+00	6.10E+00					
Lead	1.54E-04	4.00E-06							
Phenanthrene	5.52E-02	2.30E-01							
U-TOTAL	7.27E-02	1.00E-03					3.00E-03		1.50E-04

TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

GROUNDWATER										
	On-Site	FEMP Bdry								
Contaminant	onc'n (pCi/L	Conc'n (pCi/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
TC-99	6.10E-01	5.40E-02		1.3E-12	8.3E-12	6.0E-13				
CHEM	(mg/L)	(mg/L)	Kp					RfD(o)	RfD(i)	RfD(derm)

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SWL_EPC.XLS; 6/8/94; 6:16 PM

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TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

AIR						
	CURRENT (and Future fed ownership-off-prop)			*FUTURE; 85% veg; lim. erosion (ex. tr)*	*FUTURE; 50% veg; unlim. erosion (ex. tr; off)*	*FUTURE; 50% veg; unlim. erosion (off-priv)*
	On-Subunit	On-Property	Off-Prop(85% lim	On-Subunit	On-Subunit [farmer]	Off-Prop
Contaminant	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3)
NP-237	3.57E-06	3.57E-06	5.87E-08	3.57E-06	1.08E-04	1.78E-06
PU-238	2.32E-06	2.32E-06	3.81E-08	2.32E-06	7.03E-05	1.16E-06
PU-239/240	2.46E-07	2.46E-07	4.05E-09	2.46E-07	7.46E-06	1.23E-07
RA-226	4.27E-06	4.23E-06	6.92E-08	4.27E-06	1.78E-04	2.07E-06
RA-228	5.04E-06	5.04E-06	8.30E-08	5.04E-06	1.53E-04	2.52E-06
SR-90	2.87E-06	2.87E-06	4.72E-08	2.87E-06	8.69E-05	1.43E-06
TH-228	4.88E-06	4.88E-06	8.03E-08	4.88E-06	1.48E-04	2.44E-06
TH-230	1.94E-05	1.94E-05	3.20E-07	1.94E-05	5.89E-04	9.71E-06
TH-232	4.53E-06	4.53E-06	7.46E-08	4.53E-06	1.38E-04	2.27E-06
U-234	1.26E-04	1.26E-04	2.08E-06	1.26E-04	3.83E-03	6.32E-05
U-235/236	8.51E-06	8.51E-06	1.40E-07	8.51E-06	2.58E-04	4.26E-06
U-238	2.31E-04	2.31E-04	3.81E-06	2.31E-04	7.02E-03	1.16E-04
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3)
Arsenic	2.00E-08	2.00E-08	3.29E-10	2.00E-08	6.07E-07	1.00E-08
Benzo(a)anthracene	1.12E-09	1.11E-09	1.81E-11	1.12E-09	3.35E-08	5.42E-10
Benzo(a)pyrene	1.02E-09	1.02E-09	1.68E-11	1.02E-09	3.09E-08	5.10E-10
Benzo(b)fluoranthene	2.13E-09	2.13E-09	3.51E-11	2.13E-09	6.46E-08	1.07E-09
Benzo(g,h,i)perylene	1.53E-09	1.51E-09	2.47E-11	1.53E-09	4.58E-08	7.40E-10
Beryllium	2.09E-09	2.09E-09	3.45E-11	2.09E-09	6.35E-08	1.05E-09
Lead	5.70E-08	5.70E-08	9.39E-10	5.70E-08	1.73E-06	2.85E-08
Dibenzo(a,h)anthrace	6.00E-10	6.00E-10	9.88E-12	6.00E-10	1.82E-08	3.00E-10
Indeno(1,2,3-cd)pyren	1.44E-09	1.44E-09	2.37E-11	1.44E-09	4.37E-08	7.20E-10
TH-TOTAL	4.21E-08	4.17E-08	6.82E-10	4.21E-08	1.25E-06	2.04E-08
Phenanthrene	1.62E-09	1.60E-09	2.62E-11	1.62E-09	4.86E-08	7.86E-10

TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

SEDIMENT (non-GMR)								
	Current and Future							
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)			
NP-237	1.19E+00		2.2E-10	2.9E-08	4.3E-07			
RA-226	1.39E+00		7.8E-10	7.0E-09	6.0E-06			
RA-228	1.68E+00		1.0E-10	6.9E-10	2.9E-06			
SR-90	9.47E-01		3.6E-11	6.2E-11	0.0E+00			
U-234	4.20E+01		1.6E-11	2.6E-08	3.0E-11			
U-235/236	2.83E+00		1.6E-11	2.5E-08	2.4E-07			
U-238	7.73E+01		2.8E-11	5.2E-08	3.6E-08			
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(derm)
Arsenic	6.67E+00	1.00E-03	1.75E+00			1.84E+00	3.00E-04	2.85E-04
Benzo(a)anthracene	3.66E-01		7.30E-01	6.10E-01				
Benzo(a)pyrene	3.40E-01		7.30E+00	6.10E+00				
Benzo(g,h,i)perylene	5.00E-01	3.00E-01						
Beryllium	6.98E-01	1.00E-02	4.30E+00	6.10E-01			5.00E-03	5.00E-05
Dibenz(a,h)anthracen	2.00E-01		7.30E+00	6.10E+00				
Lead	1.90E+01	1.00E-02						
Phenanthrene	5.30E-01	3.00E-01						
U-TOTAL	2.25E+02	1.00E-02					3.00E-03	1.50E-04

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TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

SUBSURFACE SOIL									
Contaminant	Conc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.25		2.8E-11	1.9E-11	2.0E-06				
NP-237	0.351		2.2E-10	2.9E-08	4.3E-07				
PB-210	1.03		6.6E-10	4.0E-09	1.6E-10				
PU-238	0.328		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.68		2.3E-10	3.8E-08	2.7E-11				
RA-224	2.14		3.8E-11	1.2E-09	2.3E-08				
RA-226	1.55		7.8E-10	7.0E-09	6.0E-06				
RA-228	2.56		1.0E-10	6.9E-10	2.9E-06				
SR-90	1.58		3.6E-11	6.2E-11	0.0E+00				
TC-99	0.754		1.3E-12	8.3E-12	6.0E-13				
TH-228	3.39		5.5E-11	7.8E-08	5.6E-06				
TH-230	12.3		1.3E-11	2.9E-08	5.4E-11				
TH-232	3.59		1.7E-10	1.1E-07	8.5E-06				
U-234	97		1.6E-11	2.6E-08	3.0E-11				
U-235	1.89		1.6E-11	2.5E-08	2.4E-07				
U-235/236	8.04		1.6E-11	2.5E-08	2.4E-07				
U-238	170		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Antimony	22	1.00E-02					4.00E-04		6.00E-05
Arsenic	13.8	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	1.075	1.00E-02	4.30E+00	8.40E+00			5.00E-03		
Lead	28.3	1.00E-02							
2-Methylnap	0.1	3.00E-01							
Benzo(a)anth	7.5		7.30E-01						
Benzo(a)pyr	8.2		7.30E+00						
Benzo(b)fluo	1.5		7.30E-01						
Benzo(g,h,i)	0.49	3.00E-01							
Carbazole	4.2		2.00E-02			2.22E-02			
Dibenzo(a,h)	0.25		7.30E+00						
Indeno(1,2,3	5.5		7.30E-01						
Phenanthren	4.8	3.00E-01							
1,4-Dioxane	12.9								
Heptachloro	9.00E-04	3.00E-02	1.50E+03	1.50E+03		3.00E+03			
Heptachloro	2.50E-04	3.00E-02	1.50E+03	1.50E+03		3.00E+03			
Octachlorodi	1.37E-02	3.00E-02	1.50E+02	1.50E+02		3.00E+02			
Aroclor-125	4.80E-02	6.00E-02	7.70E+00			1.03E+01			
Aroclor-126	7.70E-02	6.00E-02	7.70E+00			1.03E+01			
TH-TOTAL	32.4	1.00E-02							

TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

PERCHED GROUNDWATER						
Contaminant	onc'n (pCi/	Kp	SF(o)	SF(i)	SF(e)	SF (derm)
TC-99	2.89E+01		1.3E-12	8.3E-12	6.0E-13	
CHEM	(mg/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)
Carbazole	9.61E-03	3.94E-02	2.00E-02			2.22E-02
2-Methylnaphthalen	7.76E-07	1.42E-01				
Endosulfan sulfate	2.00E-04					

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TABLE B3.4-2d
SOLID WASTE LANDFILL
EXPOSURE POINT CONCENTATIONS

GMR Surface Water										
Contaminant	Conc'n (pCi/L)	BCF	SF(o)	SF(i)	SF(e)	SF (derm)				
NP-237	1.50E-06	1.00E-02	2.2E-10	2.9E-08	4.3E-07					
RA-226	1.39E-07	5.00E-02	7.8E-10	7.0E-09	6.0E-06					
RA-228	1.67E-07	5.00E-02	1.0E-10	6.9E-10	2.9E-06					
SR-90	6.55E-06	3.00E-02	3.6E-11	6.2E-11	0.0E+00					
U-234	3.88E-04	2.00E-03	1.6E-11	2.6E-08	3.0E-11					
U-235/236	2.61E-06	2.00E-03	1.6E-11	2.5E-08	2.4E-07					
U-238	7.12E-05	2.00E-03	2.8E-11	5.2E-08	3.6E-08					
CHEM	(mg/L)	Kp	BCF	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	2.31E-09	1.00E-03	4.40E+01	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	9.63E-12	8.10E-01	1.18E+04	7.30E-01	6.10E-01					
Benzo(a)pyrene	3.75E-12	1.20E+00	2.55E+04	7.30E+00	6.10E+00					
Benzo(g,h,i)perylene	1.62E-12	5.37E+00	1.84E+05							
Beryllium	3.72E-11	1.00E-03	1.90E+01	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	4.38E-10	4.00E-06	4.90E+01							
U-Total	2.07E-07	1.00E-03	2.00E-03					3.00E-03		1.50E-04
Dibenzo(a,h)anthracene	2.25E-12	2.70E+00	9.30E+04	7.30E+00	6.10E+00					
Phenanthrene	1.57E-07	2.30E-01	1.75E+03							

TABLE B.3.4-4
CURRENT, TRESPASSING YOUTH
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	3.57E-06	7.4E-03	2.9E-08	2.1E-10
PU-238	2.32E-06	4.8E-03	3.9E-08	1.9E-10
PU-239/240	2.46E-07	5.1E-04	3.8E-08	1.9E-11
RA-226	4.27E-06	8.8E-03	7.0E-09	6.2E-11
RA-228	5.04E-06	1.0E-02	6.9E-10	7.2E-12
SR-90	2.87E-06	5.9E-03	6.2E-11	3.7E-13
TH-228	4.88E-06	1.0E-02	7.8E-08	7.9E-10
TH-230	1.94E-05	4.0E-02	2.9E-08	1.2E-09
TH-232	4.53E-06	9.4E-03	1.1E-07	1.0E-09
U-234	1.26E-04	2.6E-01	2.6E-08	6.8E-09
U-235/236	8.51E-06	1.8E-02	2.5E-08	4.4E-10
U-238	2.31E-04	4.8E-01	5.2E-08	2.5E-08

Total Pathway: 3.6E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	1.4E+01	2.2E-10	3.1E-09
PU-238	7.72E-01	9.2E+00	2.2E-10	2.0E-09
PU-239/240	8.20E-02	9.7E-01	2.3E-10	2.2E-10
RA-226	1.40E+00	1.7E+01	7.8E-10	1.3E-08
RA-228	1.68E+00	2.0E+01	1.0E-10	2.0E-09
SR-90	9.55E-01	1.1E+01	3.6E-11	4.1E-10
TH-228	1.63E+00	1.9E+01	5.5E-11	1.1E-09
TH-230	6.48E+00	7.7E+01	1.3E-11	1.0E-09
TH-232	1.51E+00	1.8E+01	1.7E-10	3.0E-09
U-234	4.21E+01	5.0E+02	1.6E-11	8.0E-09
U-235/236	2.84E+00	3.4E+01	1.6E-11	5.4E-10
U-238	7.72E+01	9.2E+02	2.8E-11	2.6E-08

Total Pathway: 6.0E-08

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	2.00E-08	3.8E-11	1.5E+01	5.7E-10
Benzo(a)anthracene	1.12E-09	2.1E-12	6.1E-01	1.3E-12
Benzo(a)pyrene	1.02E-09	1.9E-12	6.1E+00	1.2E-11
Benzo(b)fluoranthene	2.13E-09	4.0E-12	6.1E-01	2.5E-12
Benzo(g,h,i)perylene	1.53E-09	2.9E-12		
Beryllium	2.09E-09	3.9E-12	8.4E+00	3.3E-11
Lead	5.70E-08	1.1E-10		
Dibenzo(a,h)anthracene	6.00E-10	1.1E-12	6.1E+00	6.9E-12
Indeno(1,2,3-cd)pyrene	1.44E-09	2.7E-12	6.1E-01	1.7E-12
TH-TOTAL	4.21E-08	7.9E-11		
Phenanthrene	1.62E-09	3.1E-12		

Total Pathway: 6.2E-10

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.67E+00	7.2E-08	1.8E+00	1.3E-07
Benzo(a)anthracene	3.66E-01	3.9E-09	7.3E-01	2.9E-09
Benzo(a)pyrene	3.40E-01	3.7E-09	7.3E+00	2.7E-08
Benzo(b)fluoranthene	7.10E-01	7.7E-09	7.3E-01	5.6E-09
Benzo(g,h,i)perylene	5.00E-01	5.4E-09		
Beryllium	6.98E-01	7.5E-09	4.3E+00	3.2E-08
Lead	1.90E+01	2.1E-07		
Dibenzo(a,h)anthracene	2.00E-01	2.2E-09	7.3E+00	1.6E-08
Indeno(1,2,3-cd)pyrene	4.80E-01	5.2E-09	7.3E-01	3.8E-09
TH-TOTAL	1.38E+01	1.5E-07		
Phenanthrene	5.31E-01	5.7E-09		

Total Pathway: 2.1E-07

Total Rad + Chem 3.6E-08

Total Rad + Chem 2.7E-07

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TABLE B.3.4-4
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil				External Radiation/Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable				NP-237	2.5E-01	4.30E-07	1.1E-07	1.1E-07
				PU-238	1.6E-01	2.80E-11	4.6E-12	2.2E-09
				PU-239/240	1.8E-02	2.70E-11	4.7E-13	2.4E-10
				RA-226	3.0E-01	6.00E-06	1.8E-06	1.8E-06
				RA-228	3.6E-01	2.90E-06	1.0E-06	1.0E-06
				SR-90	2.0E-01			4.1E-10
				TH-228	3.5E-01	5.60E-06	2.0E-06	2.0E-06
				TH-230	1.4E+00	5.40E-11	7.5E-11	2.2E-09
				TH-232	3.2E-01	8.50E-06	2.7E-06	2.7E-06
				U-234	9.0E+00	3.00E-11	2.7E-10	1.5E-08
				U-235/236	6.1E-01	2.40E-07	1.5E-07	1.5E-07
				U-238	1.6E+01	3.60E-08	5.9E-07	6.4E-07
Total Pathway:				Total Pathway:			8.4E-06	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	1.6E-08	1.8E+00	2.9E-08					1.6E-07
Benzo(a)anthracene			5.8E-09					8.7E-09
Benzo(a)pyrene			5.4E-08					8.0E-08
Benzo(b)fluoranthene			1.1E-08					1.7E-08
Benzo(g,h,i)perylene	3.6E-07							
Beryllium	1.7E-08		6.5E-08	Not applicable				9.7E-08
Lead	4.5E-07							
Dibenzo(a,h)anthracene			3.2E-08					4.7E-08
Indeno(1,2,3-cd)pyrene			7.6E-09					1.1E-08
TH-TOTAL	3.3E-07							
Phenanthrene	3.8E-07							
Total Pathway:			2.0E-07	Total Pathway:				

Total Rad + Chem 2.0E-07

8.4E-06 *Total:* 8.9E-06

TABLE B.3.4-4
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	3.57E-06	7.4E-03		
PU-238	2.32E-06	4.8E-03		
PU-239/240	2.46E-07	5.1E-04		
RA-226	4.27E-06	8.8E-03		
RA-228	5.04E-06	1.0E-02		
SR-90	2.87E-06	5.9E-03		
TH-228	4.88E-06	1.0E-02		
TH-230	1.94E-05	4.0E-02		
TH-232	4.53E-06	9.4E-03		
U-234	1.26E-04	2.6E-01		
U-235/236	8.51E-06	1.8E-02		
U-238	2.31E-04	4.8E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19	1.4E+01		
PU-238	0.77	9.2E+00		
PU-239/240	0.08	9.7E-01		
RA-226	1.40	1.7E+01		
RA-228	1.68	2.0E+01		
SR-90	0.96	1.1E+01		
TH-228	1.63	1.9E+01		
TH-230	6.48	7.7E+01		
TH-232	1.51	1.8E+01		
U-234	42.10	5.0E+02		
U-235/236	2.84	3.4E+01		
U-238	77.20	9.2E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	2.00E-08	2.2E-10		
Benzo(a)anthracene	1.12E-09	1.2E-11		
Benzo(a)pyrene	1.02E-09	1.1E-11		
Benzo(b)fluoranthene	2.13E-09	2.3E-11		
Benzo(g,h,i)perylene	1.53E-09	1.7E-11		
Beryllium	2.09E-09	2.3E-11		
Lead	5.70E-08	6.3E-10		
Dibenzo(a,h)anthracene	6.00E-10	6.6E-12		
Indeno(1,2,3-cd)pyrene	1.44E-09	1.6E-11		
TH-TOTAL	4.21E-08	4.6E-10		
Phenanthrene	1.62E-09	1.8E-11		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.67	4.2E-07	3.0E-04	1.4E-03
Benzo(a)anthracene	0.37	2.3E-08		
Benzo(a)pyrene	0.34	2.1E-08		
Benzo(b)fluoranthene	0.71	4.5E-08		
Benzo(g,h,i)perylene	0.50	3.1E-08		
Beryllium	0.70	4.4E-08	5.0E-03	8.8E-06
Lead	19.00	1.2E-06		
Dibenzo(a,h)anthracene	0.20	1.3E-08		
Indeno(1,2,3-cd)pyrene	0.48	3.0E-08		
TH-TOTAL	13.80	8.7E-07		
Phenanthrene	0.53	3.3E-08		

Total Pathway: 1.4E-03

Total Rad + Chem

Total Rad + Chem 1.4E-03

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TABLE B.3.4-4
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	2.5E-01		
	PU-238	1.6E-01		
	PU-239/240	1.8E-02		
	RA-226	3.0E-01		
	RA-228	3.6E-01		
	SR-90	2.0E-01		
	TH-228	3.5E-01		
	TH-230	1.4E+00		
	TH-232	3.2E-01		
	U-234	9.0E+00		
	U-235/236	6.1E-01		
	U-238	1.6E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	9.3E-08	2.9E-04	3.3E-04					1.7E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.1E-06							
Beryllium	9.7E-08	5.0E-05	1.8E-05					2.6E-05
Lead	2.6E-06			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	1.9E-06							
Phenanthrene	2.2E-06							
Total Pathway:			3.4E-04	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 3.4E-04

otal: 1.8E-03

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TABLE B.3.4-5
CURRENT, TRESPASSING YOUTH
SOLID WASTE LANDFILL: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	5.25E-01	1.1E+01	2.2E-10	2.5E-09		2.5E-09
RA-226	4.86E-02	1.1E+00	7.8E-10	8.3E-10	Not applicable	8.3E-10
RA-228	5.85E-02	1.3E+00	1.0E-10	1.3E-10		1.3E-10
SR-90	2.30E+00	5.0E+01	3.6E-11	1.8E-09		1.8E-09
U-234	1.36E+01	3.0E+02	1.6E-11	4.8E-09		4.8E-09
U-235/236	9.14E-01	2.0E+01	1.6E-11	3.2E-10		3.2E-10
U-238	2.50E+01	5.5E+02	2.8E-11	1.5E-08		1.5E-08
			Total Pathway:	2.6E-08	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	8.09E-04	1.6E-08	1.8E+00	2.8E-08	Arsenic	2.4E-06	1.8E+00	4.3E-06	4.4E-06
Benzo(a)anthracene	3.38E-06	6.7E-11	7.3E-01	4.9E-11	Benzo(a)anthracene			4.9E-11	9.8E-11
Benzo(a)pyrene	1.31E-06	2.6E-11	7.3E+00	1.9E-10	Benzo(a)pyrene			1.9E-10	3.8E-10
Benzo(g,h,i)perylene	5.7E-07	1.1E-11			Benzo(g,h,i)perylene				
Beryllium	1.3E-05	2.6E-10	4.3E+00	1.1E-09	Beryllium	3.8E-08		1.1E-09	2.2E-09
Dibenzo(a,h)anthracene	7.9E-07	1.6E-11	7.3E+00	1.1E-10	Dibenzo(a,h)anthracene			1.1E-10	2.3E-10
Lead	1.5E-04	3.1E-09			Lead	1.8E-09			
Phenanthrene	5.5E-02	1.1E-06			Phenanthrene				
U-TOTAL	7.3E-02	1.4E-06			U-TOTAL	2.1E-04			
			Total Pathway:	3.0E-08			Total Pathway:	4.3E-06	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 5.5E-08 | Total Rad + Chem 4.3E-06 | *Total:* 4.4E-06

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TABLE B.3.4-5
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	5.25E-01	1.1E+01			Not applicable	
RA-226	4.86E-02	1.1E+00				
RA-228	5.85E-02	1.3E+00				
SR-90	2.30E+00	5.0E+01				
U-234	1.36E+01	3.0E+02				
U-235/236	9.14E-01	2.0E+01				
U-238	2.50E+01	5.5E+02				
Total Pathway:					Total Pathway:	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				Total
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	8.09E-04	9.4E-08	3.00E-04	3.1E-04	Arsenic	1.38E-05	2.9E-04	4.8E-02	4.9E-02
Benzo(a)anthracene	3.38E-06	3.9E-10			Benzo(a)anthracene	4.65E-05			
Benzo(a)pyrene	1.31E-06	1.5E-10			Benzo(a)pyrene	2.67E-05			
Benzo(g,h,i)perylene	5.69E-07	6.6E-11			Benzo(g,h,i)perylene	5.19E-05			
Beryllium	1.30E-05	1.5E-09	5.00E-03	3.0E-07	Beryllium	2.21E-07	5.0E-05	4.4E-03	4.4E-03
Dibenzo(a,h)anthracene	7.90E-07	9.2E-11			Dibenzo(a,h)anthracene	3.63E-05			
Lead	1.54E-04	1.8E-08			Lead	1.05E-08			
Phenanthrene	5.52E-02	6.4E-06			Phenanthrene	2.16E-01			
U-TOTAL	7.27E-02	8.4E-06	3.00E-03	2.8E-03	U-TOTAL	1.24E-03	1.5E-04	8.2E+00	8.2E+00
			Total Pathway:	3.1E-03			Total Pathway:	8.3E+00	
			Total Rad + Chem	3.1E-03			Total Rad + Chem	8.3E+00	*Total:* 8.3E+00

TABLE B.3.4-6
CURRENT, TRESPASSING YOUTH
SOLID WASTE LANDFILL: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	4.5E+00	2.2E-10	9.8E-10
RA-226	1.39E+00	5.2E+00	7.8E-10	4.1E-09
RA-228	1.68E+00	6.3E+00	1.0E-10	6.3E-10
SR-90	9.47E-01	3.5E+00	3.6E-11	1.3E-10
U-234	4.20E+01	1.6E+02	1.6E-11	2.5E-09
U-235/236	2.83E+00	1.1E+01	1.6E-11	1.7E-10
U-238	7.73E+01	2.9E+02	2.8E-11	8.1E-09

Total Pathway: 1.7E-08

Dermal Contact/Sediment

Not applicable

Total Pathway:

External Radiation/Sediment

Compound	Intake	SF(e)	Risk
NP-237	8.5E-02	4.3E-07	3.6E-08
RA-226	9.9E-02	6.0E-06	5.9E-07
RA-228	1.2E-01	2.9E-06	3.5E-07
SR-90	6.7E-02		
U-234	3.0E+00	3.0E-11	9.0E-11
U-235/236	2.0E-01	2.4E-07	4.8E-08
U-238	5.5E+00	3.6E-08	2.0E-07

Total Pathway: 1.2E-06

Total
3.7E-08
6.0E-07
3.5E-07
1.3E-10
2.6E-09
4.9E-08
2.1E-07

Chemical Risk

Ingestion/Sediment

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.7E+00	2.3E-08	1.8E+00	4.0E-08
Benzo(a)anthracene	3.7E-01	1.2E-09	7.3E-01	9.1E-10
Benzo(a)pyrene	3.4E-01	1.2E-09	7.3E+00	8.5E-09
Benzo(g,h,i)perylene	5.0E-01	1.7E-09		
Beryllium	7.0E-01	2.4E-09	4.3E+00	1.0E-08
Dibenz(a,h)anthracene	2.0E-01	6.8E-10	7.3E+00	5.0E-09
Lead	1.9E+01	6.5E-08		
Phenanthrene	5.3E-01	1.8E-09		
U-TOTAL	2.3E+02	7.7E-07		

Total Pathway: 6.4E-08

Dermal Contact/Sediment

Compound	Intake	SF(derm)	Risk
Arsenic	1.9E-08	1.8E+00	3.6E-08
Benzo(a)anthracene			9.1E-10
Benzo(a)pyrene			8.5E-09
Benzo(g,h,i)perylene	4.4E-07		
Beryllium	2.0E-08		1.0E-08
Dibenz(a,h)anthracene			5.0E-09
Lead	5.5E-07		
Phenanthrene	4.6E-07		
U-TOTAL	6.6E-06		

Total Pathway: 6.0E-08

External Radiation/Sediment

Not applicable

Total Pathway:

Total
7.6E-08
1.8E-09
1.7E-08
2.0E-08
1.0E-08

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 8.1E-08 | Total Rad + Chem 6.0E-08 | Total Rad + Chem 1.2E-06 | *Total:* 1.4E-06

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TABLE B.3.4-6

(continued)

SOLID WASTE LANDFILL: SEDIMENT

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment					Dermal Contact/Sediment	Total
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard		
NP-237	1.19	4.5E+00			Not applicable	
RA-226	1.39	5.2E+00				
RA-228	1.68	6.3E+00				
SR-90	0.95	3.5E+00				
U-234	42.00	1.6E+02				
U-235/236	2.83	1.1E+01				
U-238	77.30	2.9E+02				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Sediment					Dermal Contact/Sediment				Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	6.7E+00	1.3E-07	3.0E-04	4.4E-04	Arsenic	1.1E-07	2.9E-04	4.0E-04	8.4E-04
Benzo(a)anthracene	3.7E-01	7.3E-09			Benzo(a)anthracene				
Benzo(a)pyrene	3.4E-01	6.8E-09			Benzo(a)pyrene				
Benzo(g,h,i)perylene	5.0E-01	9.9E-09			Benzo(g,h,i)perylene	2.5E-06			
Beryllium	7.0E-01	1.4E-08	5.0E-03	2.8E-06	Beryllium	1.2E-07	5.0E-05	2.4E-03	2.4E-03
Dibenz(a,h)anthracene	2.0E-01	4.0E-09			Dibenz(a,h)anthracene				
Lead	1.9E+01	3.8E-07			Lead	3.2E-06			
Phenanthrene	5.3E-01	1.1E-08			Phenanthrene	2.7E-06			
U-TOTAL	2.3E+02	4.5E-06	3.0E-03	1.5E-03	U-TOTAL	3.8E-05	1.5E-04	2.5E-01	2.6E-01
			Total Pathway:	1.9E-03			Total Pathway:	2.6E-01	
			Total Rad + Chem	1.9E-03			Total Rad + Chem	2.6E-01	*Total:* 2.6E-01

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TABLE B.3.4-7(a)
CURRENT, OFF-PROPERTY FARMER
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	5.87E-08	6.8E-03	2.90E-08	2.0E-10	2.0E-10
PU-238	3.81E-08	4.4E-03	3.90E-08	1.7E-10	1.7E-10
PU-239/240	4.05E-09	4.7E-04	3.80E-08	1.8E-11	1.8E-11
RA-226	6.92E-08	8.0E-03	7.00E-09	5.6E-11	5.6E-11
RA-228	8.30E-08	9.6E-03	6.90E-10	6.6E-12	6.6E-12
SR-90	4.72E-08	5.5E-03	6.20E-11	3.4E-13	3.4E-13
TH-228	8.03E-08	9.3E-03	7.80E-08	7.3E-10	7.3E-10
TH-230	3.20E-07	3.7E-02	2.90E-08	1.1E-09	1.1E-09
TH-232	7.46E-08	8.6E-03	1.10E-07	9.5E-10	9.5E-10
U-234	2.08E-06	2.4E-01	2.60E-08	6.3E-09	6.3E-09
U-235/236	1.40E-07	1.6E-02	2.50E-08	4.1E-10	4.1E-10
U-238	3.81E-06	4.4E-01	5.20E-08	2.3E-08	2.3E-08
			Total Pathway:	3.3E-08	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk	
Arsenic	3.29E-10	2.1E-11	1.5E+01	3.2E-10	3.2E-10
Benzo(a)anthracene	1.81E-11	1.2E-12	6.1E-01	7.2E-13	7.2E-13
Benzo(a)pyrene	1.68E-11	1.1E-12	6.1E+00	6.6E-12	6.6E-12
Benzo(b)fluoranthene	3.51E-11	2.3E-12	6.1E-01	1.4E-12	1.4E-12
Benzo(g,h,i)perylene	2.47E-11	1.6E-12			
Beryllium	3.45E-11	2.2E-12	8.4E+00	1.9E-11	1.9E-11
Lead	9.39E-10	6.1E-11			
Dibenzo(a,h)anthracene	9.88E-12	6.4E-13	6.1E+00	3.9E-12	3.9E-12
Indeno(1,2,3-cd)pyrene	2.37E-11	1.5E-12	6.1E-01	9.4E-13	9.4E-13
TH-TOTAL	6.82E-10	4.4E-11			
Phenanthrene	2.62E-11	1.7E-12			
			Total Pathway:	3.5E-10	

Total Rad + Chem 3.3E-08 *Total:* 3.3E-08

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TABLE B.3.4-7(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	5.87E-08	6.8E-03		
PU-238	3.81E-08	4.4E-03		
PU-239/240	4.05E-09	4.7E-04		
RA-226	6.92E-08	8.0E-03		
RA-228	8.30E-08	9.6E-03		
SR-90	4.72E-08	5.5E-03		
TH-228	8.03E-08	9.3E-03		
TH-230	3.20E-07	3.7E-02		
TH-232	7.46E-08	8.6E-03		
U-234	2.08E-06	2.4E-01		
U-235/236	1.40E-07	1.6E-02		
U-238	3.81E-06	4.4E-01		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	3.29E-10	2.1E-11		
Benzo(a)anthracene	1.81E-11	1.2E-12		
Benzo(a)pyrene	1.68E-11	1.1E-12		
Benzo(b)fluoranthene	3.51E-11	2.3E-12		
Benzo(g,h,i)perylene	2.47E-11	1.6E-12		
Beryllium	3.45E-11	2.2E-12		
Lead	9.39E-10	6.1E-11		
Dibenzo(a,h)anthracene	9.88E-12	6.4E-13		
Indeno(1,2,3-cd)pyrene	2.37E-11	1.5E-12		
TH-TOTAL	6.82E-10	4.4E-11		
Phenanthrene	2.62E-11	1.7E-12		

Total Pathway:

Total

Total Rad + Chem

Total:

TABLE B.3.4-7(b)
CURRENT, OFF-PROPERTY CHILD
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	5.87E-08	1.2E-04	2.9E-08	3.6E-12	3.6E-12
PU-238	3.81E-08	8.0E-05	3.9E-08	3.1E-12	3.1E-12
PU-239/240	4.05E-09	8.5E-06	3.8E-08	3.2E-13	3.2E-13
RA-226	6.92E-08	1.5E-04	7.0E-09	1.0E-12	1.0E-12
RA-228	8.30E-08	1.7E-04	6.9E-10	1.2E-13	1.2E-13
SR-90	4.72E-08	9.9E-05	6.2E-11	6.1E-15	6.1E-15
TH-228	8.03E-08	1.7E-04	7.8E-08	1.3E-11	1.3E-11
TH-230	3.20E-07	6.7E-04	2.9E-08	1.9E-11	1.9E-11
TH-232	7.46E-08	1.6E-04	1.1E-07	1.7E-11	1.7E-11
U-234	2.08E-06	4.4E-03	2.6E-08	1.1E-10	1.1E-10
U-235/236	1.40E-07	2.9E-04	2.5E-08	7.4E-12	7.4E-12
U-238	3.81E-06	8.0E-03	5.2E-08	4.2E-10	4.2E-10
			Total Pathway:	6.0E-10	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk	
Arsenic	3.29E-10	1.8E-12	1.5E+01	2.7E-11	2.7E-11
Benzo(a)anthracene	1.81E-11	9.9E-14	6.1E-01	6.0E-14	6.0E-14
Benzo(a)pyrene	1.68E-11	9.2E-14	6.1E+00	5.6E-13	5.6E-13
Benzo(b)fluoranthene	3.51E-11	1.9E-13	6.1E-01	1.2E-13	1.2E-13
Benzo(g,h,i)perylene	2.47E-11	1.4E-13			
Beryllium	3.45E-11	1.9E-13	8.4E+00	1.6E-12	1.6E-12
Lead	9.39E-10	5.1E-12			
Dibenzo(a,h)anthracene	9.88E-12	5.4E-14	6.1E+00	3.3E-13	3.3E-13
Indeno(1,2,3-cd)pyrene	2.37E-11	1.3E-13	6.1E-01	7.9E-14	7.9E-14
TH-TOTAL	6.82E-10	3.7E-12			
Phenanthrene	2.62E-11	1.4E-13			
			Total Pathway:	3.0E-11	

Total Rad + Chem 6.2E-10 *Total:* 6.2E-10

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TABLE B.3.4-7(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard					Total
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard	
NP-237	5.87E-08	1.2E-04			
PU-238	3.81E-08	8.0E-05			
PU-239/240	4.05E-09	8.5E-06			
RA-226	6.92E-08	1.5E-04			
RA-228	8.30E-08	1.7E-04			
SR-90	4.72E-08	9.9E-05			
TH-228	8.03E-08	1.7E-04			
TH-230	3.20E-07	6.7E-04			
TH-232	7.46E-08	1.6E-04			
U-234	2.08E-06	4.4E-03			
U-235/236	1.40E-07	2.9E-04			
U-238	3.81E-06	8.0E-03			
				Total Pathway:	

Chemical Hazard					
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard	
Arsenic	3.29E-10	2.1E-11			
Benzo(a)anthracene	1.81E-11	1.2E-12			
Benzo(a)pyrene	1.68E-11	1.1E-12			
Benzo(b)fluoranthene	3.51E-11	2.2E-12			
Benzo(g,h,i)perylene	2.47E-11	1.6E-12			
Beryllium	3.45E-11	2.2E-12			
Lead	9.39E-10	6.0E-11			
Dibenzo(a,h)anthracene	9.88E-12	6.3E-13			
Indeno(1,2,3-cd)pyrene	2.37E-11	1.5E-12			
TH-TOTAL	6.82E-10	4.4E-11			
Phenanthrene	2.62E-11	1.7E-12			
				Total Pathway:	

Total Rad + Chem | *Total:*

TABLE B.3.4-8(a)
CURRENT, OFF-PROPERTY FARMER
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	5.01E-07	9.2E-04	2.2E-10	2.0E-13	NP-237	4.56E-08	3.4E-04	2.2E-10	7.4E-14	2.8E-13
PU-238	1.26E-09	2.3E-06	2.2E-10	5.1E-16	PU-238	2.52E-10	1.9E-06	2.2E-10	4.1E-16	9.2E-16
PU-239/240	3.84E-10	7.1E-07	2.3E-10	1.6E-16	PU-239/240	7.68E-11	5.6E-07	2.3E-10	1.3E-16	2.9E-16
RA-226	4.41E-06	8.1E-03	7.8E-10	6.3E-12	RA-226	7.93E-06	5.8E-02	7.8E-10	4.5E-11	5.2E-11
RA-228	9.49E-07	1.7E-03	1.0E-10	1.7E-13	RA-228	1.72E-06	1.3E-02	1.0E-10	1.3E-12	1.4E-12
SR-90	5.96E-06	1.1E-02	3.6E-11	3.9E-13	SR-90	2.98E-05	2.2E-01	3.6E-11	7.9E-12	8.3E-12
TH-228	1.95E-08	3.6E-05	5.5E-11	2.0E-15	TH-228	1.66E-08	1.2E-04	5.5E-11	6.7E-15	8.7E-15
TH-230	4.42E-07	8.1E-04	1.3E-11	1.1E-14	TH-230	3.69E-07	2.7E-03	1.3E-11	3.5E-14	4.6E-14
TH-232	1.03E-07	1.9E-04	1.7E-10	3.2E-14	TH-232	8.62E-08	6.3E-04	1.7E-10	1.1E-13	1.4E-13
U-234	2.86E-05	5.2E-02	1.6E-11	8.4E-13	U-234	8.57E-05	6.3E-01	1.6E-11	1.0E-11	1.1E-11
U-235/236	1.92E-06	3.5E-03	1.6E-11	5.7E-14	U-235/236	5.77E-06	4.2E-02	1.6E-11	6.8E-13	7.3E-13
U-238	5.23E-05	9.6E-02	2.8E-11	2.7E-12	U-238	1.57E-04	1.2E+00	2.8E-11	3.2E-11	3.5E-11
			Total Pathway:	1.1E-11				Total Pathway:	9.8E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.50E-07	1.5E-10	1.8E+00	2.7E-10	Arsenic	4.49E-09	1.8E-11	1.8E+00	3.2E-11	3.0E-10
Benzo(a)anthracene	1.01E-08	1.0E-11	7.3E-01	7.6E-12	Benzo(a)anthracene	3.21E-09	1.3E-11	7.3E-01	9.6E-12	1.7E-11
Benzo(a)pyrene	2.48E-08	2.6E-11	7.3E+00	1.9E-10	Benzo(a)pyrene	7.89E-09	3.2E-11	7.3E+00	2.4E-10	4.2E-10
Benzo(b)fluoranthene	5.32E-08	5.5E-11	7.3E-01	4.0E-11	Benzo(b)fluoranthene	1.69E-08	7.0E-11	7.3E-01	5.1E-11	9.1E-11
Benzo(g,h,i)perylene	4.70E-07	4.8E-10			Benzo(g,h,i)perylene	1.49E-07	6.1E-10			
Beryllium	1.05E-08	1.1E-11	4.3E+00	4.7E-11	Beryllium	9.47E-12	3.9E-14	4.3E+00	1.7E-13	4.7E-11
Lead	2.61E-07	2.7E-10			Lead	2.17E-07	8.9E-10			
Dibenzo(a,h)anthracene	7.97E-08	8.2E-11	7.3E+00	6.0E-10	Dibenzo(a,h)anthracene	2.53E-08	1.0E-10	7.3E+00	7.6E-10	1.4E-09
Indeno(1,2,3-cd)pyrene	1.03E-07	1.1E-10	7.3E-01	7.7E-11	Indeno(1,2,3-cd)pyrene	3.28E-08	1.3E-10	7.3E-01	9.8E-11	1.8E-10
TH-TOTAL	9.46E-10	9.7E-13			TH-TOTAL	7.88E-10	3.2E-12			
Phenanthrene	1.09E-09	1.1E-12			Phenanthrene	3.51E-10	1.4E-12			
			Total Pathway:	1.2E-09				Total Pathway:	1.2E-09	
			Total Rad + Chem	1.2E-09				Total Rad + Chem	1.3E-09	*Total:* 2.5E-09

ORIGINAL

TABLE B.3.4-8(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.01E-07	9.2E-04		
PU-238	1.26E-09	2.3E-06		
PU-239/240	3.84E-10	7.1E-07		
RA-226	4.41E-06	8.1E-03		
RA-228	9.49E-07	1.7E-03		
SR-90	5.96E-06	1.1E-02		
TH-228	1.95E-08	3.6E-05		
TH-230	4.42E-07	8.1E-04		
TH-232	1.03E-07	1.9E-04		
U-234	2.86E-05	5.2E-02		
U-235/236	1.92E-06	3.5E-03		
U-238	5.23E-05	9.6E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.6E-08	3.4E-04		
PU-238	2.5E-10	1.9E-06		
PU-239/240	7.7E-11	5.6E-07		
RA-226	7.9E-06	5.8E-02		
RA-228	1.7E-06	1.3E-02		
SR-90	3.0E-05	2.2E-01		
TH-228	1.7E-08	1.2E-04		
TH-230	3.7E-07	2.7E-03		
TH-232	8.6E-08	6.3E-04		
U-234	8.6E-05	6.3E-01		
U-235/236	5.8E-06	4.2E-02		
U-238	1.6E-04	1.2E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.50E-07	1.5E-10	3.0E-04	5.1E-07
Benzo(a)anthracene	1.01E-08	1.0E-11		
Benzo(a)pyrene	2.48E-08	2.6E-11		
Benzo(b)fluoranthene	5.32E-08	5.5E-11		
Benzo(g,h,i)perylene	4.70E-07	4.8E-10		
Beryllium	1.05E-08	1.1E-11	5.0E-03	2.2E-09
Lead	2.61E-07	2.7E-10		
Dibenzo(a,h)anthracene	7.97E-08	8.2E-11		
Indeno(1,2,3-cd)pyrene	1.03E-07	1.1E-10		
TH-TOTAL	9.46E-10	9.7E-13		
Phenanthrene	1.09E-09	1.1E-12		

Total Pathway: 5.1E-07

Total Rad + Chem 5.1E-07

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	4.49E-09	1.8E-11	3.0E-04	6.1E-08
Benzo(a)anthracene	3.21E-09	1.3E-11		
Benzo(a)pyrene	7.89E-09	3.2E-11		
Benzo(b)fluoranthene	1.69E-08	7.0E-11		
Benzo(g,h,i)perylene	1.49E-07	6.1E-10		
Beryllium	9.47E-12	3.9E-14	5.0E-03	7.8E-12
Lead	2.17E-07	8.9E-10		
Dibenzo(a,h)anthracene	2.53E-08	1.0E-10		
Indeno(1,2,3-cd)pyrene	3.28E-08	1.3E-10		
TH-TOTAL	7.88E-10	3.2E-12		
Phenanthrene	3.51E-10	1.4E-12		

Total Pathway: 6.1E-08

Total Rad + Chem 6.1E-08

Total

5.7E-07

2.2E-09

Total: 5.8E-07

TABLE B.3.4-8(b)
CURRENT, OFF-PROPERTY CHILD
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	5.01E-07	3.1E-05	2.2E-10	6.7E-15	NP-237	4.56E-08	6.5E-05	2.2E-10	1.4E-14	2.1E-14
PU-238	1.26E-09	7.7E-08	2.2E-10	1.7E-17	PU-238	2.52E-10	3.6E-07	2.2E-10	7.9E-17	9.6E-17
PU-239/240	3.84E-10	2.3E-08	2.3E-10	5.4E-18	PU-239/240	7.68E-11	1.1E-07	2.3E-10	2.5E-17	3.1E-17
RA-226	4.41E-06	2.7E-04	7.8E-10	2.1E-13	RA-226	7.93E-06	1.1E-02	7.8E-10	8.8E-12	9.0E-12
RA-228	9.49E-07	5.8E-05	1.0E-10	5.8E-15	RA-228	1.72E-06	2.5E-03	1.0E-10	2.5E-13	2.5E-13
SR-90	5.96E-06	3.6E-04	3.6E-11	1.3E-14	SR-90	2.98E-05	4.3E-02	3.6E-11	1.5E-12	1.5E-12
TH-228	1.95E-08	1.2E-06	5.5E-11	6.5E-17	TH-228	1.66E-08	2.4E-05	5.5E-11	1.3E-15	1.4E-15
TH-230	4.42E-07	2.7E-05	1.3E-11	3.5E-16	TH-230	3.69E-07	5.3E-04	1.3E-11	6.8E-15	7.2E-15
TH-232	1.03E-07	6.3E-06	1.7E-10	1.1E-15	TH-232	8.62E-08	1.2E-04	1.7E-10	2.1E-14	2.2E-14
U-234	2.86E-05	1.7E-03	1.6E-11	2.8E-14	U-234	8.57E-05	1.2E-01	1.6E-11	2.0E-12	2.0E-12
U-235/236	1.92E-06	1.2E-04	1.6E-11	1.9E-15	U-235/236	5.77E-06	8.2E-03	1.6E-11	1.3E-13	1.3E-13
U-238	5.23E-05	3.2E-03	2.8E-11	8.9E-14	U-238	1.57E-04	2.2E-01	2.8E-11	6.3E-12	6.4E-12
			Total Pathway:	3.6E-13				Total Pathway:	1.9E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.50E-07	2.4E-11	1.8E+00	4.2E-11	Arsenic	4.49E-09	1.7E-11	1.8E+00	2.9E-11	7.1E-11
Benzo(a)anthracene	1.01E-08	1.6E-12	7.3E-01	1.2E-12	Benzo(a)anthracene	3.21E-09	1.2E-11	7.3E-01	8.7E-12	9.9E-12
Benzo(a)pyrene	2.48E-08	3.9E-12	7.3E+00	2.9E-11	Benzo(a)pyrene	7.89E-09	2.9E-11	7.3E+00	2.1E-10	2.4E-10
Benzo(b)fluoranthene	5.32E-08	8.5E-12	7.3E-01	6.2E-12	Benzo(b)fluoranthene	1.69E-08	6.3E-11	7.3E-01	4.6E-11	5.2E-11
Benzo(g,h,i)perylene	4.70E-07	7.5E-11			Benzo(g,h,i)perylene	1.49E-07	5.6E-10			
Beryllium	1.05E-08	1.7E-12	4.3E+00	7.2E-12	Beryllium	9.47E-12	3.5E-14	4.3E+00	1.5E-13	7.3E-12
Lead	2.61E-07	4.1E-11			Lead	2.17E-07	8.1E-10			
Dibenzo(a,h)anthracene	7.97E-08	1.3E-11	7.3E+00	9.2E-11	Dibenzo(a,h)anthracene	2.53E-08	9.4E-11	7.3E+00	6.9E-10	7.8E-10
Indeno(1,2,3-cd)pyrene	1.03E-07	1.6E-11	7.3E-01	1.2E-11	Indeno(1,2,3-cd)pyrene	3.28E-08	1.2E-10	7.3E-01	8.9E-11	1.0E-10
TH-TOTAL	9.46E-10	1.5E-13			TH-TOTAL	7.88E-10	2.9E-12			
Phenanthrene	1.09E-09	1.7E-13			Phenanthrene	3.51E-10	1.3E-12			
			Total Pathway:	1.9E-10				Total Pathway:	1.1E-09	
			Total Rad + Chem	1.9E-10				Total Rad + Chem	1.1E-09	*Total:* 1.3E-09

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TABLE B.3.4-8(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.01E-07	3.1E-05		
PU-238	1.26E-09	7.7E-08		
PU-239/240	3.84E-10	2.3E-08		
RA-226	4.41E-06	2.7E-04		
RA-228	9.49E-07	5.8E-05		
SR-90	5.96E-06	3.6E-04		
TH-228	1.95E-08	1.2E-06		
TH-230	4.42E-07	2.7E-05		
TH-232	1.03E-07	6.3E-06		
U-234	2.86E-05	1.7E-03		
U-235/236	1.92E-06	1.2E-04		
U-238	5.23E-05	3.2E-03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.6E-08	6.5E-05		
PU-238	2.5E-10	3.6E-07		
PU-239/240	7.7E-11	1.1E-07		
RA-226	7.9E-06	1.1E-02		
RA-228	1.7E-06	2.5E-03		
SR-90	3.0E-05	4.3E-02		
TH-228	1.7E-08	2.4E-05		
TH-230	3.7E-07	5.3E-04		
TH-232	8.6E-08	1.2E-04		
U-234	8.6E-05	1.2E-01		
U-235/236	5.8E-06	8.2E-03		
U-238	1.6E-04	2.2E-01		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.50E-07	2.8E-10	3.0E-04	9.2E-07
Benzo(a)anthracene	1.01E-08	1.9E-11		
Benzo(a)pyrene	2.48E-08	4.6E-11		
Benzo(b)fluoranthene	5.32E-08	9.9E-11		
Benzo(g,h,i)perylene	4.70E-07	8.7E-10		
Beryllium	1.05E-08	2.0E-11	5.0E-03	3.9E-09
Lead	2.61E-07	4.8E-10		
Dibenzo(a,h)anthracene	7.97E-08	1.5E-10		
Indeno(1,2,3-cd)pyrene	1.03E-07	1.9E-10		
TH-TOTAL	9.46E-10	1.8E-12		
Phenanthrene	1.09E-09	2.0E-12		

Total Pathway: 9.3E-07

Total Rad + Chem 9.3E-07

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	4.49E-09	2.0E-10	3.0E-04	6.5E-07
Benzo(a)anthracene	3.21E-09	1.4E-10		
Benzo(a)pyrene	7.89E-09	3.4E-10		
Benzo(b)fluoranthene	1.69E-08	7.4E-10		
Benzo(g,h,i)perylene	1.49E-07	6.5E-09		
Beryllium	9.47E-12	4.1E-13	5.0E-03	8.2E-11
Lead	2.17E-07	9.4E-09		
Dibenzo(a,h)anthracene	2.53E-08	1.1E-09		
Indeno(1,2,3-cd)pyrene	3.28E-08	1.4E-09		
TH-TOTAL	7.88E-10	3.4E-11		
Phenanthrene	3.51E-10	1.5E-11		

Total Pathway: 6.5E-07

Total Rad + Chem 6.5E-07

Total

1.6E-06

4.0E-09

Total: 1.6E-06

TABLE B.3.4-9(a)

CURRENT OFF-PROPERTY FARMER

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	3.39E-08	6.7E-02	2.2E-10	1.5E-11	NP-237	3.39E-08	3.5E-02	2.2E-10	7.8E-12	2.2E-11
PU-238	1.87E-08	3.7E-02	2.2E-10	8.1E-12	PU-238	1.87E-08	1.9E-02	2.2E-10	4.3E-12	1.2E-11
PU-239/240	2.00E-09	3.9E-03	2.3E-10	9.1E-13	PU-239/240	2.00E-09	2.1E-03	2.3E-10	4.8E-13	1.4E-12
RA-226	4.14E-08	8.2E-02	7.8E-10	6.4E-11	RA-226	4.14E-08	4.3E-02	7.8E-10	3.4E-11	9.7E-11
RA-228	4.08E-08	8.0E-02	1.0E-10		RA-228	4.04E-08	4.2E-02	1.0E-10	4.2E-12	4.2E-12
SR-90	3.84E-08	7.6E-02	3.6E-11	2.7E-12	SR-90	3.83E-08	4.0E-02	3.6E-11	1.4E-12	4.2E-12
TH-228	3.93E-08	7.7E-02	5.5E-11	4.3E-12	TH-228	3.81E-08	4.0E-02	5.5E-11	2.2E-12	6.4E-12
TH-230	1.61E-07	3.2E-01	1.3E-11	4.1E-12	TH-230	1.61E-07	1.7E-01	1.3E-11	2.2E-12	6.3E-12
TH-232	3.74E-08	7.4E-02	1.7E-10	1.3E-11	TH-232	3.74E-08	3.9E-02	1.7E-10	6.6E-12	1.9E-11
U-234	1.12E-06	2.2E+00	1.6E-11	3.5E-11	U-234	1.12E-06	1.2E+00	1.6E-11	1.9E-11	5.4E-11
U-235/236	7.52E-08	1.5E-01	1.6E-11	2.4E-12	U-235/236	7.52E-08	7.8E-02	1.6E-11	1.3E-12	3.6E-12
U-238	2.05E-06	4.0E+00	2.8E-11	1.1E-10	U-238	2.05E-06	2.1E+00	2.8E-11	6.0E-11	1.7E-10
			Total Pathway:	2.6E-10				Total Pathway:	1.4E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	2.23E-07	2.5E-10	1.8E+00	4.3E-10	Arsenic	2.23E-07	1.3E-10	1.8E+00	2.3E-10	6.6E-10
Benzo(a)anthracene	9.54E-09	1.1E-11	7.3E-01	7.7E-12	Benzo(a)anthracene	9.48E-09	5.5E-12	7.3E-01	4.0E-12	1.2E-11
Benzo(a)pyrene	8.58E-09	9.4E-12	7.3E+00	6.9E-11	Benzo(a)pyrene	8.52E-09	5.0E-12	7.3E+00	3.6E-11	1.1E-10
Benzo(b)fluoranthene	1.78E-08	2.0E-11	7.3E-01	1.4E-11	Benzo(b)fluoranthene	1.76E-08	1.0E-11	7.3E-01	7.5E-12	2.2E-11
Benzo(g,h,i)perylene	1.22E-08	1.3E-11			Benzo(g,h,i)perylene	1.21E-08	7.1E-12			
Beryllium	2.27E-08	2.5E-11	4.3E+00	1.1E-10	Beryllium	2.27E-08	1.3E-11	4.3E+00	5.7E-11	1.6E-10
Lead	1.62E-06	1.8E-09			Lead	1.62E-06	9.5E-10			
Dibenzo(a,h)anthracene	4.94E-09	5.4E-12	7.3E+00	4.0E-11	Dibenzo(a,h)anthracene	4.91E-09	2.9E-12	7.3E+00	2.1E-11	6.1E-11
Indeno(1,2,3-cd)pyrene	1.19E-08	1.3E-11	7.3E-01	9.5E-12	Indeno(1,2,3-cd)pyrene	1.18E-08	6.9E-12	7.3E-01	5.0E-12	1.5E-11
TH-TOTAL	3.42E-07	3.8E-10			TH-TOTAL	3.42E-07	2.0E-10			
Phenanthrene	1.37E-08	1.5E-11			Phenanthrene	1.34E-08	7.8E-12			
			Total Pathway:	6.8E-10				Total Pathway:	3.6E-10	
			Total Rad + Chem	9.4E-10				Total Rad + Chem	5.0E-10	*Total:* 1.4E-09

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TABLE B.3.4-9(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.4E-08	6.7E-02		
PU-238	1.9E-08	3.7E-02		
PU-239/240	2.0E-09	3.9E-03		
RA-226	4.1E-08	8.2E-02		
		8.0E-02		
SR-90	3.8E-08	7.6E-02		
TH-228	3.9E-08	7.7E-02		
TH-230	1.6E-07	3.2E-01		
TH-232	3.7E-08	7.4E-02		
U-234	1.1E-06	2.2E+00		
U-235/236	7.5E-08	1.5E-01		
U-238	2.0E-06	4.0E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.39E-08	3.5E-02		
PU-238	1.87E-08	1.9E-02		
PU-239/240	2.00E-09	2.1E-03		
RA-226	4.14E-08	4.3E-02		
RA-228	4.04E-08	4.2E-02		
SR-90	3.83E-08	4.0E-02		
TH-228	3.81E-08	4.0E-02		
TH-230	1.61E-07	1.7E-01		
TH-232	3.74E-08	3.9E-02		
U-234	1.12E-06	1.2E+00		
U-235/236	7.52E-08	7.8E-02		
U-238	2.05E-06	2.1E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.2E-07	2.5E-10	3.0E-04	8.2E-07
Benzo(a)anthracene	9.5E-09	1.1E-11		
Benzo(a)pyrene	8.6E-09	9.4E-12		
Benzo(b)fluoranthene	1.8E-08	2.0E-11		
Benzo(g,h,i)perylene	1.2E-08	1.3E-11		
Beryllium	2.3E-08	2.5E-11	5.0E-03	5.0E-09
Lead	1.6E-06	1.8E-09		
Dibenzo(a,h)anthracene	4.9E-09	5.4E-12		
Indeno(1,2,3-cd)pyrene	1.2E-08	1.3E-11		
TH-TOTAL	3.4E-07	3.8E-10		
Phenanthrene	1.4E-08	1.5E-11		

Total Pathway: 8.2E-07

Total Rad + Chem 8.2E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.23E-07	1.3E-10	3.0E-04	4.3E-07
Benzo(a)anthracene	9.48E-09	5.5E-12		
Benzo(a)pyrene	8.52E-09	5.0E-12		
Benzo(b)fluoranthene	1.76E-08	1.0E-11		
Benzo(g,h,i)perylene	1.21E-08	7.1E-12		
Beryllium	2.27E-08	1.3E-11	5.0E-03	6.6E-14
Lead	1.62E-06	9.5E-10		
Dibenzo(a,h)anthracene	4.91E-09	2.9E-12		
Indeno(1,2,3-cd)pyrene	1.18E-08	6.9E-12		
TH-TOTAL	3.42E-07	2.0E-10		
Phenanthrene	1.34E-08	7.8E-12		

Total Pathway: 4.3E-07

Total Rad + Chem 4.3E-07

Total

1.3E-06

5.0E-09

Total: 1.3E-06

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TABLE B.3.4-9(b)

CURRENT OFF-PROPERTY CHILD

SOLID.WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	3.39E-08	2.8E-03	2.2E-10	6.3E-13	NP-237	3.39E-08	4.4E-03	2.2E-10	9.6E-13	1.6E-12
PU-238	1.87E-08	1.6E-03	2.2E-10	3.5E-13	PU-238	1.87E-08	2.4E-03	2.2E-10	5.3E-13	8.7E-13
PU-239/240	2.00E-09	1.7E-04	2.3E-10	3.9E-14	PU-239/240	2.00E-09	2.6E-04	2.3E-10	5.9E-14	9.8E-14
RA-226	4.14E-08	3.5E-03	7.8E-10	2.7E-12	RA-226	4.14E-08	5.3E-03	7.8E-10	4.1E-12	6.9E-12
RA-228	4.08E-08	3.4E-03	1.0E-10	3.4E-13	RA-228	4.04E-08	5.2E-03	1.0E-10	5.2E-13	8.6E-13
SR-90	3.84E-08	3.2E-03	3.6E-11	1.2E-13	SR-90	3.83E-08	4.9E-03	3.6E-11	1.8E-13	2.9E-13
TH-228	3.93E-08	3.3E-03	5.5E-11	1.8E-13	TH-228	3.81E-08	4.9E-03	5.5E-11	2.7E-13	4.5E-13
TH-230	1.61E-07	1.3E-02	1.3E-11	1.8E-13	TH-230	1.61E-07	2.1E-02	1.3E-11	2.7E-13	4.4E-13
TH-232	3.74E-08	3.1E-03	1.7E-10	5.3E-13	TH-232	3.74E-08	4.8E-03	1.7E-10	8.2E-13	1.4E-12
U-234	1.12E-06	9.4E-02	1.6E-11	1.5E-12	U-234	1.12E-06	1.4E-01	1.6E-11	2.3E-12	3.8E-12
U-235/236	7.52E-08	6.3E-03	1.6E-11	1.0E-13	U-235/236	7.52E-08	9.7E-03	1.6E-11	1.5E-13	2.6E-13
U-238	2.05E-06	1.7E-01	2.8E-11	4.8E-12	U-238	2.05E-06	2.6E-01	2.8E-11	7.4E-12	1.2E-11
			Total Pathway:	1.1E-11				Total Pathway:	1.8E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	2.23E-07	4.9E-11	1.8E+00	8.6E-11	Arsenic	2.23E-07	7.5E-11	1.8E+00	1.3E-10	2.2E-10
Benzo(a)anthracene	9.54E-09	2.1E-12	7.3E-01	1.5E-12	Benzo(a)anthracene	9.48E-09	3.2E-12	7.3E-01	2.3E-12	3.8E-12
Benzo(a)pyrene	8.58E-09	1.9E-12	7.3E+00	1.4E-11	Benzo(a)pyrene	8.52E-09	2.9E-12	7.3E+00	2.1E-11	3.5E-11
Benzo(b)fluoranthene	1.78E-08	3.9E-12	7.3E-01	2.8E-12	Benzo(b)fluoranthene	1.76E-08	5.9E-12	7.3E-01	4.3E-12	7.2E-12
Benzo(g,h,i)perylene	1.22E-08	2.7E-12			Benzo(g,h,i)perylene	1.21E-08	4.1E-12			
Beryllium	2.27E-08	5.0E-12	4.3E+00	2.1E-11	Beryllium	2.27E-08	7.6E-12	4.3E+00	3.3E-11	5.4E-11
Lead	1.62E-06	3.6E-10			Lead	1.62E-06	5.4E-10			
Dibenzo(a,h)anthracene	4.94E-09	1.1E-12	7.3E+00	7.9E-12	Dibenzo(a,h)anthracene	4.91E-09	1.6E-12	7.3E+00	1.2E-11	2.0E-11
Indeno(1,2,3-cd)pyrene	1.19E-08	2.6E-12	7.3E-01	1.9E-12	Indeno(1,2,3-cd)pyrene	1.18E-08	3.9E-12	7.3E-01	2.9E-12	4.8E-12
TH-TOTAL	3.42E-07	7.5E-11			TH-TOTAL	3.42E-07	1.1E-10			
Phenanthrene	1.37E-08	3.0E-12			Phenanthrene	1.34E-08	4.5E-12			
			Total Pathway:	1.3E-10				Total Pathway:	2.1E-10	
			Total Rad + Chem	1.5E-10				Total Rad + Chem	2.2E-10	*Total:* 3.7E-10

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TABLE B.3.4-9(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237	3.4E-08	2.8E-03			NP-237	3.39E-08	4.4E-03			
PU-238	1.9E-08	1.6E-03			PU-238	1.87E-08	2.4E-03			
PU-239/240	2.0E-09	1.7E-04			PU-239/240	2.00E-09	2.6E-04			
RA-226	4.1E-08	3.5E-03			RA-226	4.14E-08	5.3E-03			
RA-228	4.1E-08	3.4E-03			RA-228	4.04E-08	5.2E-03			
SR-90	3.8E-08	3.2E-03			SR-90	3.83E-08	4.9E-03			
TH-228	3.9E-08	3.3E-03			TH-228	3.81E-08	4.9E-03			
TH-230	1.6E-07	1.3E-02			TH-230	1.61E-07	2.1E-02			
TH-232	3.7E-08	3.1E-03			TH-232	3.74E-08	4.8E-03			
U-234	1.1E-06	9.4E-02			U-234	1.12E-06	1.4E-01			
U-235/236	7.5E-08	6.3E-03			U-235/236	7.52E-08	9.7E-03			
U-238	2.0E-06	1.7E-01			U-238	2.05E-06	2.6E-01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	2.2E-07	5.7E-10	3.0E-04	1.9E-06	Arsenic	2.23E-07	8.7E-10	3.0E-04	2.9E-06	4.8E-06
Benzo(a)anthracene	9.5E-09	2.4E-11			Benzo(a)anthracene	9.48E-09	3.7E-11			
Benzo(a)pyrene	8.6E-09	2.2E-11			Benzo(a)pyrene	8.52E-09	3.3E-11			
Benzo(b)fluoranthene	1.8E-08	4.5E-11			Benzo(b)fluoranthene	1.76E-08	6.9E-11			
Benzo(g,h,i)perylene	1.2E-08	3.1E-11			Benzo(g,h,i)perylene	1.21E-08	4.7E-11			
Beryllium	2.3E-08	5.8E-11	5.0E-03	1.2E-08	Beryllium	2.27E-08	8.9E-11	5.0E-03	4.4E-13	1.2E-08
Lead	1.6E-06	4.1E-09			Lead	1.62E-06	6.3E-09			
Dibenzo(a,h)anthracene	4.9E-09	1.3E-11			Dibenzo(a,h)anthracene	4.91E-09	1.9E-11			
Indeno(1,2,3-cd)pyrene	1.2E-08	3.0E-11			Indeno(1,2,3-cd)pyrene	1.18E-08	4.6E-11			
TH-TOTAL	3.4E-07	8.8E-10			TH-TOTAL	3.42E-07	1.3E-09			
Phenanthrene	1.4E-08	3.5E-11			Phenanthrene	1.34E-08	5.2E-11			
			Total Pathway:	1.9E-06				Total Pathway:	2.9E-06	
			Total Rad + Chem	1.9E-06				Total Rad + Chem	2.9E-06	*Total:* 4.8E-06

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TABLE B.3.4-10
CURRENT, MILK AND MEAT USER
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	3.05E-05	5.6E-02	2.2E-10	1.2E-11	NP-237	2.77E-06	2.0E-02	2.2E-10	4.5E-12	1.7E-11
PU-238	7.66E-08	1.4E-04	2.2E-10	3.1E-14	PU-238	1.53E-08	1.1E-04	2.2E-10	2.5E-14	5.6E-14
PU-239/240	2.33E-08	4.3E-05	2.3E-10	9.9E-15	PU-239/240	4.67E-09	3.4E-05	2.3E-10	7.9E-15	1.8E-14
RA-226	2.69E-04	4.9E-01	7.8E-10	3.9E-10	RA-226	4.85E-04	3.6E+00	7.8E-10	2.8E-09	3.2E-09
RA-228	5.76E-05	1.1E-01	1.0E-10	1.1E-11	RA-228	1.04E-04	7.7E-01	1.0E-10	7.7E-11	8.7E-11
SR-90	3.62E-04	6.7E-01	3.6E-11	2.4E-11	SR-90	1.81E-03	1.3E+01	3.6E-11	4.8E-10	5.0E-10
TH-228	1.19E-06	2.2E-03	5.5E-11	1.2E-13	TH-228	1.01E-06	7.4E-03	5.5E-11	4.1E-13	5.3E-13
TH-230	2.68E-05	4.9E-02	1.3E-11	6.4E-13	TH-230	2.23E-05	1.6E-01	1.3E-11	2.1E-12	2.8E-12
TH-232	6.28E-06	1.2E-02	1.7E-10	2.0E-12	TH-232	5.24E-06	3.8E-02	1.7E-10	6.5E-12	8.5E-12
U-234	1.73E-03	3.2E+00	1.6E-11	5.1E-11	U-234	5.19E-03	3.8E+01	1.6E-11	6.1E-10	6.6E-10
U-235/236	1.17E-04	2.1E-01	1.6E-11	3.4E-12	U-235/236	3.51E-04	2.6E+00	1.6E-11	4.1E-11	4.5E-11
U-238	3.17E-03	5.8E+00	2.8E-11	1.6E-10	U-238	9.52E-03	7.0E+01	2.8E-11	2.0E-09	2.1E-09
			Total Pathway:	6.5E-10				Total Pathway:	6.0E-09	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.50E-07	1.5E-10	1.8E+00	2.7E-10	Arsenic	4.49E-09	1.8E-11	1.8E+00	3.2E-11	3.0E-10
Benzo(a)anthracene	1.01E-08	1.0E-11	7.3E-01	7.6E-12	Benzo(a)anthracene	3.21E-09	1.3E-11	7.3E-01	9.6E-12	1.7E-11
Benzo(a)pyrene	2.48E-08	2.6E-11	7.3E+00	1.9E-10	Benzo(a)pyrene	7.89E-09	3.2E-11	7.3E+00	2.4E-10	4.2E-10
Benzo(b)fluoranthene	5.32E-08	5.5E-11	7.3E-01	4.0E-11	Benzo(b)fluoranthene	1.69E-08	7.0E-11	7.3E-01	5.1E-11	9.1E-11
Benzo(g,h,i)perylene	4.70E-07	4.8E-10			Benzo(g,h,i)perylene	1.49E-07	6.1E-10			
Beryllium	1.05E-08	1.1E-11	4.3E+00	4.7E-11	Beryllium	9.47E-12	3.9E-14	4.3E+00	1.7E-13	4.7E-11
Lead	2.61E-07	2.7E-10			Lead	2.17E-07	8.9E-10			
Dibenzo(a,h)anthracene	7.97E-08	8.2E-11	7.3E+00	6.0E-10	Dibenzo(a,h)anthracene	2.53E-08	1.0E-10	7.3E+00	7.6E-10	1.4E-09
Indeno(1,2,3-cd)pyrene	1.03E-07	1.1E-10	7.3E-01	7.7E-11	Indeno(1,2,3-cd)pyrene	3.28E-08	1.3E-10	7.3E-01	9.8E-11	1.8E-10
TH-TOTAL	9.46E-10	9.7E-13			TH-TOTAL	7.88E-10	3.2E-12			
Phenanthrene	1.09E-09	1.1E-12			Phenanthrene	3.51E-10	1.4E-12			
			Total Pathway:	1.2E-09				Total Pathway:	1.2E-09	
			Total Rad + Chem	1.9E-09				Total Rad + Chem	7.1E-09	*Total:* 9.0E-09

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TABLE B.3.4-10
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	3.05E-05	5.6E-02			NP-237	2.8E-06	2.0E-02			
PU-238	7.66E-08	1.4E-04			PU-238	1.5E-08	1.1E-04			
PU-239/240	2.33E-08	4.3E-05			PU-239/240	4.7E-09	3.4E-05			
RA-226	2.69E-04	4.9E-01			RA-226	4.8E-04	3.6E+00			
RA-228	5.76E-05	1.1E-01			RA-228	1.0E-04	7.7E-01			
SR-90	3.62E-04	6.7E-01			SR-90	1.8E-03	1.3E+01			
TH-228	1.19E-06	2.2E-03			TH-228	1.0E-06	7.4E-03			
TH-230	2.68E-05	4.9E-02			TH-230	2.2E-05	1.6E-01			
TH-232	6.28E-06	1.2E-02			TH-232	5.2E-06	3.8E-02			
U-234	1.73E-03	3.2E+00			U-234	5.2E-03	3.8E+01			
U-235/236	1.17E-04	2.1E-01			U-235/236	3.5E-04	2.6E+00			
U-238	3.17E-03	5.8E+00			U-238	9.5E-03	7.0E+01			
Total Pathway:					Total Pathway:					

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	1.50E-07	1.5E-10	3.0E-04	5.1E-07	Arsenic	4.49E-09	1.8E-11	3.0E-04	6.1E-08	5.7E-07
Benzo(a)anthracene	1.01E-08	1.0E-11			Benzo(a)anthracene	3.21E-09	1.3E-11			
Benzo(a)pyrene	2.48E-08	2.6E-11			Benzo(a)pyrene	7.89E-09	3.2E-11			
Benzo(b)fluoranthene	5.32E-08	5.5E-11			Benzo(b)fluoranthene	1.69E-08	7.0E-11			
Benzo(g,h,i)perylene	4.70E-07	4.8E-10			Benzo(g,h,i)perylene	1.49E-07	6.1E-10			
Beryllium	1.05E-08	1.1E-11	5.0E-03	2.2E-09	Beryllium	9.47E-12	3.9E-14	5.0E-03	7.8E-12	2.2E-09
Lead	2.61E-07	2.7E-10			Lead	2.17E-07	8.9E-10			
Dibenzo(a,h)anthracene	7.97E-08	8.2E-11			Dibenzo(a,h)anthracene	2.53E-08	1.0E-10			
Indeno(1,2,3-cd)pyrene	1.03E-07	1.1E-10			Indeno(1,2,3-cd)pyrene	3.28E-08	1.3E-10			
TH-TOTAL	9.46E-10	9.7E-13			TH-TOTAL	7.88E-10	3.2E-12			
Phenanthrene	1.09E-09	1.1E-12			Phenanthrene	3.51E-10	1.4E-12			
			Total Pathway:	5.1E-07				Total Pathway:	6.1E-08	
			Total Rad + Chem	5.1E-07				Total Rad + Chem	6.1E-08	*Total:* 5.8E-07

TABLE B.3.4-11
CURRENT, GROUNDSKEEPER
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	3.57E-06	6.2E-02	2.9E-08	1.8E-09
PU-238	2.32E-06	4.1E-02	3.9E-08	1.6E-09
PU-239/240	2.46E-07	4.3E-03	3.8E-08	1.6E-10
RA-226	4.27E-06	7.5E-02	7.0E-09	5.2E-10
RA-228	5.04E-06	8.8E-02	6.9E-10	6.1E-11
SR-90	2.87E-06	5.0E-02	6.2E-11	3.1E-12
TH-228	4.88E-06	8.5E-02	7.8E-08	6.7E-09
TH-230	1.94E-05	3.4E-01	2.9E-08	9.8E-09
TH-232	4.53E-06	7.9E-02	1.1E-07	8.7E-09
U-234	1.26E-04	2.2E+00	2.6E-08	5.7E-08
U-235/236	8.51E-06	1.5E-01	2.5E-08	3.7E-09
U-238	2.31E-04	4.0E+00	5.2E-08	2.1E-07

Total Pathway: 3.0E-07

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	1.0E+02	2.2E-10	2.3E-08
PU-238	7.72E-01	6.8E+01	2.2E-10	1.5E-08
PU-239/240	8.20E-02	7.2E+00	2.3E-10	1.7E-09
RA-226	1.40E+00	1.2E+02	7.8E-10	9.6E-08
RA-228	1.68E+00	1.5E+02	1.0E-10	1.5E-08
SR-90	9.55E-01	8.4E+01	3.6E-11	3.0E-09
TH-228	1.63E+00	1.4E+02	5.5E-11	7.8E-09
TH-230	6.48E+00	5.7E+02	1.3E-11	7.4E-09
TH-232	1.51E+00	1.3E+02	1.7E-10	2.2E-08
U-234	4.21E+01	3.7E+03	1.6E-11	5.9E-08
U-235/236	2.84E+00	2.5E+02	1.6E-11	4.0E-09
U-238	7.72E+01	6.8E+03	2.8E-11	1.9E-07

Total Pathway: 4.4E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	2.00E-08	2.0E-10	1.5E+01	2.9E-09
Benzo(a)anthracene	1.12E-09	1.1E-11	6.1E-01	6.7E-12
Benzo(a)pyrene	1.02E-09	1.0E-11	6.1E+00	6.1E-11
Benzo(b)fluoranthene	2.13E-09	2.1E-11	6.1E-01	1.3E-11
Benzo(g,h,i)perylene	1.53E-09	1.5E-11		
Beryllium	2.09E-09	2.0E-11	8.4E+00	1.7E-10
Lead	5.70E-08	5.6E-10		
Dibenzo(a,h)anthracene	6.00E-10	5.9E-12	6.1E+00	3.6E-11
Indeno(1,2,3-cd)pyrene	1.44E-09	1.4E-11	6.1E-01	8.6E-12
TH-TOTAL	4.21E-08	4.1E-10		
Phenanthrene	1.62E-09	1.6E-11		

Total Pathway: 3.2E-09

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.67E+00	3.3E-07	1.8E+00	5.7E-07
Benzo(a)anthracene	3.66E-01	1.8E-08	7.3E-01	1.3E-08
Benzo(a)pyrene	3.40E-01	1.7E-08	7.3E+00	1.2E-07
Benzo(b)fluoranthene	7.10E-01	3.5E-08	7.3E-01	2.5E-08
Benzo(g,h,i)perylene	5.00E-01	2.4E-08		
Beryllium	6.98E-01	3.4E-08	4.3E+00	1.5E-07
Lead	1.90E+01	9.3E-07		
Dibenzo(a,h)anthracene	2.00E-01	9.8E-09	7.3E+00	7.1E-08
Indeno(1,2,3-cd)pyrene	4.80E-01	2.3E-08	7.3E-01	1.7E-08
TH-TOTAL	1.38E+01	6.8E-07		
Phenanthrene	5.31E-01	2.6E-08		

Total Pathway: 9.7E-07

Total Rad + Chem 3.0E-07

Total Rad + Chem 1.4E-06

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TABLE B.3.4-11
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	9.5E-01	4.30E-07	4.1E-07	4.3E-07
	PU-238	6.2E-01	2.80E-11	1.7E-11	1.6E-08
	PU-239/240	6.6E-02	2.70E-11	1.8E-12	1.8E-09
	RA-226	1.1E+00	6.00E-06	6.7E-06	6.8E-06
	RA-228	1.3E+00	2.90E-06	3.9E-06	3.9E-06
	SR-90	7.6E-01			3.0E-09
	TH-228	1.3E+00	5.60E-06	7.3E-06	7.3E-06
	TH-230	5.2E+00	5.40E-11	2.8E-10	1.7E-08
	TH-232	1.2E+00	8.50E-06	1.0E-05	1.0E-05
	U-234	3.4E+01	3.00E-11	1.0E-09	1.2E-07
	U-235/236	2.3E+00	2.40E-07	5.4E-07	5.5E-07
	U-238	6.2E+01	3.60E-08	2.2E-06	2.6E-06
Total Pathway:			Total Pathway:	3.1E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	1.9E-08	1.8E+00	3.5E-08					6.1E-07
Benzo(a)anthracene			1.3E-08					2.6E-08
Benzo(a)pyrene			1.2E-07					2.4E-07
Benzo(b)fluoranthene			2.5E-08					5.1E-08
Benzo(g,h,i)perylene	4.2E-07							
Beryllium	2.0E-08		1.5E-07		Not applicable			2.9E-07
Lead	5.3E-07							
Dibenzo(a,h)anthracene			7.1E-08					1.4E-07
Indeno(1,2,3-cd)pyrene			1.7E-08					3.4E-08
TH-TOTAL	3.9E-07							
Phenanthrene	4.5E-07							
Total Pathway:			4.3E-07	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 4.3E-07 3.1E-05 *Total:* 3.3E-05

TABLE B.3.4-11
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	3.57E-06	6.2E-02		
PU-238	2.32E-06	4.1E-02		
PU-239/240	2.46E-07	4.3E-03		
RA-226	4.27E-06	7.5E-02		
RA-228	5.04E-06	8.8E-02		
SR-90	2.87E-06	5.0E-02		
TH-228	4.88E-06	8.5E-02		
TH-230	1.94E-05	3.4E-01		
TH-232	4.53E-06	7.9E-02		
U-234	1.26E-04	2.2E+00		
U-235/236	8.51E-06	1.5E-01		
U-238	2.31E-04	4.0E+00		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19	1.0E+02		
PU-238	0.77	6.8E+01		
PU-239/240	0.08	7.2E+00		
RA-226	1.40	1.2E+02		
RA-228	1.68	1.5E+02		
SR-90	0.96	8.4E+01		
TH-228	1.63	1.4E+02		
TH-230	6.48	5.7E+02		
TH-232	1.51	1.3E+02		
U-234	42.10	3.7E+03		
U-235/236	2.84	2.5E+02		
U-238	77.20	6.8E+03		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	2.00E-08	5.5E-10		
Benzo(a)anthracene	1.12E-09	3.1E-11		
Benzo(a)pyrene	1.02E-09	2.8E-11		
Benzo(b)fluoranthene	2.13E-09	5.8E-11		
Benzo(g,h,i)perylene	1.53E-09	4.2E-11		
Beryllium	2.09E-09	5.7E-11		
Lead	5.70E-08	1.6E-09		
Dibenzo(a,h)anthracene	6.00E-10	1.6E-11		
Indeno(1,2,3-cd)pyrene	1.44E-09	3.9E-11		
TH-TOTAL	4.21E-08	1.2E-09		
Phenanthrene	1.62E-09	4.4E-11		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.67	9.1E-07	3.0E-04	3.0E-03
Benzo(a)anthracene	0.37	5.0E-08		
Benzo(a)pyrene	0.34	4.7E-08		
Benzo(b)fluoranthene	0.71	9.7E-08		
Benzo(g,h,i)perylene	0.50	6.8E-08		
Beryllium	0.70	9.6E-08	5.0E-03	1.9E-05
Lead	19.00	2.6E-06		
Dibenzo(a,h)anthracene	0.20	2.7E-08		
Indeno(1,2,3-cd)pyrene	0.48	6.6E-08		
TH-TOTAL	13.80	1.9E-06		
Phenanthrene	0.53	7.3E-08		

Total Pathway: 3.1E-03

Total Rad + Chem

Total Rad + Chem 3.1E-03

TABLE B.3.4-11
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	9.5E-01		
	PU-238	6.2E-01		
	PU-239/240	6.6E-02		
	RA-226	1.1E+00		
	RA-228	1.3E+00		
	SR-90	7.6E-01		
	TH-228	1.3E+00		
	TH-230	5.2E+00		
	TH-232	1.2E+00		
	U-234	3.4E+01		
	U-235/236	2.3E+00		
	U-238	6.2E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	5.3E-08	2.9E-04	1.8E-04					3.2E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.2E-06							
Beryllium	5.5E-08	5.0E-05	1.1E-03					1.1E-03
Lead	1.5E-06			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	1.1E-06							
Phenanthrene	1.3E-06							
Total Pathway:	1.3E-03			Total Pathway:				

Total Rad + Chem 1.3E-03

otal: 4.3E-03

TABLE B.3.4-12(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	1.78E-06	2.1E-01	2.9E-08	6.0E-09	6.0E-09
PU-238	1.16E-06	1.3E-01	3.9E-08	5.2E-09	5.2E-09
PU-239/240	1.23E-07	1.4E-02	3.8E-08	5.4E-10	5.4E-10
RA-226	2.07E-06	2.4E-01	7.0E-09	1.7E-09	1.7E-09
RA-228	2.52E-06	2.9E-01	6.9E-10	2.0E-10	2.0E-10
SR-90	1.43E-06	1.7E-01	6.2E-11	1.0E-11	1.0E-11
TH-228	2.44E-06	2.8E-01	7.8E-08	2.2E-08	2.2E-08
TH-230	9.71E-06	1.1E+00	2.9E-08	3.3E-08	3.3E-08
TH-232	2.27E-06	2.6E-01	1.1E-07	2.9E-08	2.9E-08
U-234	6.32E-05	7.3E+00	2.6E-08	1.9E-07	1.9E-07
U-235/236	4.26E-06	4.9E-01	2.5E-08	1.2E-08	1.2E-08
U-238	1.16E-04	1.3E+01	5.2E-08	7.0E-07	7.0E-07

Total Pathway: 1.0E-06

Chemical Risk

Inhalation of Particulates/Soil					
Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.00E-08	6.5E-10	1.5E+01	9.7E-09	9.7E-09
Benzo(a)anthracene	5.42E-10	3.5E-11	6.1E-01	2.1E-11	2.1E-11
Benzo(a)pyrene	5.10E-10	3.3E-11	6.1E+00	2.0E-10	2.0E-10
Benzo(b)fluoranthene	1.07E-09	6.9E-11	6.1E-01	4.2E-11	4.2E-11
Benzo(g,h,i)perylene	7.40E-10	4.8E-11			
Beryllium	1.05E-09	6.8E-11	8.4E+00	5.7E-10	5.7E-10
Lead	2.85E-08	1.8E-09			
Dibenzo(a,h)anthracene	3.00E-10	1.9E-11	6.1E+00	1.2E-10	1.2E-10
Indeno(1,2,3-cd)pyrene	7.20E-10	4.7E-11	6.1E-01	2.8E-11	2.8E-11
TH-TOTAL	2.04E-08	1.3E-09			
Phenanthrene	7.86E-10	5.1E-11			

Total Pathway: 1.1E-08

Total Rad + Chem 1.0E-06 *Total:* 1.0E-06

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TABLE B.3.4-12(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	1.78E-06	2.1E-01		
PU-238	1.16E-06	1.3E-01		
PU-239/240	1.23E-07	1.4E-02		
RA-226	2.07E-06	2.4E-01		
RA-228	2.52E-06	2.9E-01		
SR-90	1.43E-06	1.7E-01		
TH-228	2.44E-06	2.8E-01		
TH-230	9.71E-06	1.1E+00		
TH-232	2.27E-06	2.6E-01		
U-234	6.32E-05	7.3E+00		
U-235/236	4.26E-06	4.9E-01		
U-238	1.16E-04	1.3E+01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.00E-08	6.5E-10		
Benzo(a)anthracene	5.42E-10	3.5E-11		
Benzo(a)pyrene	5.10E-10	3.3E-11		
Benzo(b)fluoranthene	1.07E-09	6.9E-11		
Benzo(g,h,i)perylene	7.40E-10	4.8E-11		
Beryllium	1.05E-09	6.8E-11		
Lead	2.85E-08	1.8E-09		
Dibenzo(a,h)anthracene	3.00E-10	1.9E-11		
Indeno(1,2,3-cd)pyrene	7.20E-10	4.7E-11		
TH-TOTAL	2.04E-08	1.3E-09		
Phenanthrene	7.86E-10	5.1E-11		

Total Pathway:

Total Rad + Chem

Total

Total:

TABLE B.3.4-12(b)
FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
	Inhalation of Particulates/Soil				Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	1.78E-06	3.7E-03	2.9E-08	1.1E-10	1.1E-10
PU-238	1.16E-06	2.4E-03	3.9E-08	9.5E-11	9.5E-11
PU-239/240	1.23E-07	2.6E-04	3.8E-08	9.8E-12	9.8E-12
RA-226	2.07E-06	4.3E-03	7.0E-09	3.0E-11	3.0E-11
RA-228	2.52E-06	5.3E-03	6.9E-10	3.7E-12	3.7E-12
SR-90	1.43E-06	3.0E-03	6.2E-11	1.9E-13	1.9E-13
TH-228	2.44E-06	5.1E-03	7.8E-08	4.0E-10	4.0E-10
TH-230	9.71E-06	2.0E-02	2.9E-08	5.9E-10	5.9E-10
TH-232	2.27E-06	4.8E-03	1.1E-07	5.2E-10	5.2E-10
U-234	6.32E-05	1.3E-01	2.6E-08	3.5E-09	3.5E-09
U-235/236	4.26E-06	8.9E-03	2.5E-08	2.2E-10	2.2E-10
U-238	1.16E-04	2.4E-01	5.2E-08	1.3E-08	1.3E-08
			Total Pathway:	1.8E-08	

Chemical Risk					
	Inhalation of Particulates/Soil				
Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk	
Arsenic	1.00E-08	5.5E-11	1.5E+01	8.2E-10	8.2E-10
Benzo(a)anthracene	5.42E-10	3.0E-12	6.1E-01	1.8E-12	1.8E-12
Benzo(a)pyrene	5.10E-10	2.8E-12	6.1E+00	1.7E-11	1.7E-11
Benzo(b)fluoranthene	1.07E-09	5.9E-12	6.1E-01	3.6E-12	3.6E-12
Benzo(g,h,i)perylene	7.40E-10	4.1E-12			
Beryllium	1.05E-09	5.8E-12	8.4E+00	4.8E-11	4.8E-11
Lead	2.85E-08	1.6E-10			
Dibenzo(a,h)anthracene	3.00E-10	1.6E-12	6.1E+00	1.0E-11	1.0E-11
Indeno(1,2,3-cd)pyrene	7.20E-10	3.9E-12	6.1E-01	2.4E-12	2.4E-12
TH-TOTAL	2.04E-08	1.1E-10			
Phenanthrene	7.86E-10	4.3E-12			
			Total Pathway:	9.1E-10	

Total Rad + Chem 1.9E-08 *Total:* 1.9E-08

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TABLE B.3.4-12(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	1.78E-06	3.7E-03		
PU-238	1.16E-06	2.4E-03		
PU-239/240	1.23E-07	2.6E-04		
RA-226	2.07E-06	4.3E-03		
RA-228	2.52E-06	5.3E-03		
SR-90	1.43E-06	3.0E-03		
TH-228	2.44E-06	5.1E-03		
TH-230	9.71E-06	2.0E-02		
TH-232	2.27E-06	4.8E-03		
U-234	6.32E-05	1.3E-01		
U-235/236	4.26E-06	8.9E-03		
U-238	1.16E-04	2.4E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	1.00E-08	6.4E-10		
Benzo(a)anthracene	5.42E-10	3.5E-11		
Benzo(a)pyrene	5.10E-10	3.3E-11		
Benzo(b)fluoranthene	1.07E-09	6.8E-11		
Benzo(g,h,i)perylene	7.40E-10	4.7E-11		
Beryllium	1.05E-09	6.7E-11		
Lead	2.85E-08	1.8E-09		
Dibenzo(a,h)anthracene	3.00E-10	1.9E-11		
Indeno(1,2,3-cd)pyrene	7.20E-10	4.6E-11		
TH-TOTAL	2.04E-08	1.3E-09		
Phenanthrene	7.86E-10	5.0E-11		

Total Pathway:

Total

Total Rad + Chem

Total:

TABLE B.3.4-12(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	5.87E-08	6.8E-03	2.90E-08	2.0E-10	2.0E-10
PU-238	3.81E-08	4.4E-03	3.90E-08	1.7E-10	1.7E-10
PU-239/240	4.05E-09	4.7E-04	3.80E-08	1.8E-11	1.8E-11
RA-226	6.92E-08	8.0E-03	7.00E-09	5.6E-11	5.6E-11
RA-228	8.30E-08	9.6E-03	6.90E-10	6.6E-12	6.6E-12
SR-90	4.72E-08	5.5E-03	6.20E-11	3.4E-13	3.4E-13
TH-228	8.03E-08	9.3E-03	7.80E-08	7.3E-10	7.3E-10
TH-230	3.20E-07	3.7E-02	2.90E-08	1.1E-09	1.1E-09
TH-232	7.46E-08	8.6E-03	1.10E-07	9.5E-10	9.5E-10
U-234	2.08E-06	2.4E-01	2.60E-08	6.3E-09	6.3E-09
U-235/236	1.40E-07	1.6E-02	2.50E-08	4.1E-10	4.1E-10
U-238	3.81E-06	4.4E-01	5.20E-08	2.3E-08	2.3E-08

Total Pathway: 3.3E-08

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk	
Arsenic	3.29E-10	2.1E-11	1.5E+01	3.2E-10	3.2E-10
Benzo(a)anthracene	1.81E-11	1.2E-12	6.1E-01	7.2E-13	7.2E-13
Benzo(a)pyrene	1.68E-11	1.1E-12	6.1E+00	6.6E-12	6.6E-12
Benzo(b)fluoranthene	3.51E-11	2.3E-12	6.1E-01	1.4E-12	1.4E-12
Benzo(g,h,i)perylene	2.47E-11	1.6E-12			
Beryllium	3.45E-11	2.2E-12	8.4E+00	1.9E-11	1.9E-11
Lead	9.39E-10	6.1E-11			
Dibenzo(a,h)anthracene	9.88E-12	6.4E-13	6.1E+00	3.9E-12	3.9E-12
Indeno(1,2,3-cd)pyrene	2.37E-11	1.5E-12	6.1E-01	9.4E-13	9.4E-13
TH-TOTAL	6.82E-10	4.4E-11			
Phenanthrene	2.62E-11	1.7E-12			

Total Pathway: 3.5E-10

Total Rad + Chem 3.3E-08 *Total:* 3.3E-08

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TABLE B.3.4-12(c)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	5.87E-08	6.8E-03		
PU-238	3.81E-08	4.4E-03		
PU-239/240	4.05E-09	4.7E-04		
RA-226	6.92E-08	8.0E-03		
RA-228	8.30E-08	9.6E-03		
SR-90	4.72E-08	5.5E-03		
TH-228	8.03E-08	9.3E-03		
TH-230	3.20E-07	3.7E-02		
TH-232	7.46E-08	8.6E-03		
U-234	2.08E-06	2.4E-01		
U-235/236	1.40E-07	1.6E-02		
U-238	3.81E-06	4.4E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	3.29E-10	2.1E-11		
Benzo(a)anthracene	1.81E-11	1.2E-12		
Benzo(a)pyrene	1.68E-11	1.1E-12		
Benzo(b)fluoranthene	3.51E-11	2.3E-12		
Benzo(g,h,i)perylene	2.47E-11	1.6E-12		
Beryllium	3.45E-11	2.2E-12		
Lead	9.39E-10	6.1E-11		
Dibenzo(a,h)anthracene	9.88E-12	6.4E-13		
Indeno(1,2,3-cd)pyrene	2.37E-11	1.5E-12		
TH-TOTAL	6.82E-10	4.4E-11		
Phenanthrene	2.62E-11	1.7E-12		

Total Pathway:

Total Rad + Chem

Total

Total:

TABLE B.3.4-12(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
NP-237	5.87E-08	1.2E-04	2.90E-08	3.6E-12	3.6E-12
PU-238	3.81E-08	8.0E-05	3.90E-08	3.1E-12	3.1E-12
PU-239/240	4.05E-09	8.5E-06	3.80E-08	3.2E-13	3.2E-13
RA-226	6.92E-08	1.5E-04	7.00E-09	1.0E-12	1.0E-12
RA-228	8.30E-08	1.7E-04	6.90E-10	1.2E-13	1.2E-13
SR-90	4.72E-08	9.9E-05	6.20E-11	6.1E-15	6.1E-15
TH-228	8.03E-08	1.7E-04	7.80E-08	1.3E-11	1.3E-11
TH-230	3.20E-07	6.7E-04	2.90E-08	1.9E-11	1.9E-11
TH-232	7.46E-08	1.6E-04	1.10E-07	1.7E-11	1.7E-11
U-234	2.08E-06	4.4E-03	2.60E-08	1.1E-10	1.1E-10
U-235/236	1.40E-07	2.9E-04	2.50E-08	7.4E-12	7.4E-12
U-238	3.81E-06	8.0E-03	5.20E-08	4.2E-10	4.2E-10

Total Pathway: 6.0E-10

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk	
Arsenic	3.29E-10	1.8E-12	1.5E+01	2.7E-11	2.7E-11
Benzo(a)anthracene	1.81E-11	9.9E-14	6.1E-01	6.0E-14	6.0E-14
Benzo(a)pyrene	1.68E-11	9.2E-14	6.1E+00	5.6E-13	5.6E-13
Benzo(b)fluoranthene	3.51E-11	1.9E-13	6.1E-01	1.2E-13	1.2E-13
Benzo(g,h,i)perylene	2.47E-11	1.4E-13			
Beryllium	3.45E-11	1.9E-13	8.4E+00	1.6E-12	1.6E-12
Lead	9.39E-10	5.1E-12			
Dibenzo(a,h)anthracene	9.88E-12	5.4E-14	6.1E+00	3.3E-13	3.3E-13
Indeno(1,2,3-cd)pyrene	2.37E-11	1.3E-13	6.1E-01	7.9E-14	7.9E-14
TH-TOTAL	6.82E-10	3.7E-12			
Phenanthrene	2.62E-11	1.4E-13			

Total Pathway: 3.0E-11

Total Rad + Chem 6.2E-10 *Total:* 6.2E-10

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TABLE B.3.4-12(d)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	5.87E-08	1.2E-04		
PU-238	3.81E-08	8.0E-05		
PU-239/240	4.05E-09	8.5E-06		
RA-226	6.92E-08	1.5E-04		
RA-228	8.30E-08	1.7E-04		
SR-90	4.72E-08	9.9E-05		
TH-228	8.03E-08	1.7E-04		
TH-230	3.20E-07	6.7E-04		
TH-232	7.46E-08	1.6E-04		
U-234	2.08E-06	4.4E-03		
U-235/236	1.40E-07	2.9E-04		
U-238	3.81E-06	8.0E-03		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	3.29E-10	2.1E-11		
Benzo(a)anthracene	1.81E-11	1.2E-12		
Benzo(a)pyrene	1.68E-11	1.1E-12		
Benzo(b)fluoranthene	3.51E-11	2.2E-12		
Benzo(g,h,i)perylene	2.47E-11	1.6E-12		
Beryllium	3.45E-11	2.2E-12		
Lead	9.39E-10	6.0E-11		
Dibenzo(a,h)anthracene	9.88E-12	6.3E-13		
Indeno(1,2,3-cd)pyrene	2.37E-11	1.5E-12		
TH-TOTAL	6.82E-10	4.4E-11		
Phenanthrene	2.62E-11	1.7E-12		

Total Pathway:

Total

Total Rad + Chem

Total:

TABLE B.3.4-13(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.52E-05	2.8E-02	2.2E-10	6.1E-12	NP-237	1.38E-06	1.0E-02	2.2E-10	2.2E-12	8.4E-12
PU-238	3.83E-08	7.0E-05	2.2E-10	1.5E-14	PU-238	7.67E-09	5.6E-05	2.2E-10	1.2E-14	2.8E-14
PU-239/240	1.17E-08	2.1E-05	2.3E-10	4.9E-15	PU-239/240	2.33E-09	1.7E-05	2.3E-10	3.9E-15	8.9E-15
RA-226	1.32E-04	2.4E-01	7.8E-10	1.9E-10	RA-226	2.37E-04	1.7E+00	7.8E-10	1.4E-09	1.5E-09
RA-228	2.88E-05	5.3E-02	1.0E-10	5.3E-12	RA-228	5.22E-05	3.8E-01	1.0E-10	3.8E-11	4.4E-11
SR-90	1.80E-04	3.3E-01	3.6E-11	1.2E-11	SR-90	9.04E-04	6.6E+00	3.6E-11	2.4E-10	2.5E-10
TH-228	5.94E-07	1.1E-03	5.5E-11	6.0E-14	TH-228	5.05E-07	3.7E-03	5.5E-11	2.0E-13	2.6E-13
TH-230	1.3E-05	2.5E-02	1.30E-11	3.2E-13	TH-230	1.12E-05	8.2E-02	1.3E-11	1.1E-12	1.4E-12
TH-232	3.15E-06	5.8E-03	1.7E-10	9.8E-13	TH-232	2.62E-06	1.9E-02	1.7E-10	3.3E-12	4.3E-12
U-234	8.68E-04	1.6E+00	1.6E-11	2.6E-11	U-234	2.60E-03	1.9E+01	1.6E-11	3.1E-10	3.3E-10
U-235/236	5.85E-05	1.1E-01	1.6E-11	1.7E-12	U-235/236	1.75E-04	1.3E+00	1.6E-11	2.1E-11	2.2E-11
U-238	1.59E-03	2.9E+00	2.8E-11	8.2E-11	U-238	4.78E-03	3.5E+01	2.8E-11	9.8E-10	1.1E-09
			Total Pathway:	3.2E-10				Total Pathway:	3.0E-09	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	4.55E-06	4.7E-09	1.8E+00	8.2E-09	Arsenic	1.36E-07	5.6E-10	1.8E+00	9.8E-10	9.2E-09
Benzo(a)anthracene	3.03E-07	3.1E-10	7.3E-01	2.3E-10	Benzo(a)anthracene	9.63E-08	4.0E-10	7.3E-01	2.9E-10	5.2E-10
Benzo(a)pyrene	7.54E-07	7.7E-10	7.3E+00	5.7E-09	Benzo(a)pyrene	2.40E-07	9.8E-10	7.3E+00	7.2E-09	1.3E-08
Benzo(b)fluoranthene	1.62E-06	1.7E-09	7.3E-01	1.2E-09	Benzo(b)fluoranthene	5.16E-07	2.1E-09	7.3E-01	1.5E-09	2.8E-09
Benzo(g,h,i)perylene	1.41E-05	1.4E-08			Benzo(g,h,i)perylene	4.47E-06	1.8E-08			
Beryllium	3.20E-07	3.3E-10	4.3E+00	1.4E-09	Beryllium	2.88E-10	1.2E-12	4.3E+00	5.1E-12	1.4E-09
Lead	7.91E-06	8.1E-09			Lead	6.59E-06	2.7E-08			
Dibenzo(a,h)anthracene	2.42E-06	2.5E-09	7.3E+00	1.8E-08	Dibenzo(a,h)anthracene	7.68E-07	3.2E-09	7.3E+00	2.3E-08	4.1E-08
Indeno(1,2,3-cd)pyrene	3.14E-06	3.2E-09	7.3E-01	2.4E-09	Indeno(1,2,3-cd)pyrene	9.96E-07	4.1E-09	7.3E-01	3.0E-09	5.3E-09
TH-TOTAL	2.83E-08	2.9E-11			TH-TOTAL	2.36E-08	9.7E-11			
Phenanthrene	3.27E-08	3.4E-11			Phenanthrene	1.05E-08	4.3E-11			
			Total Pathway:	3.7E-08				Total Pathway:	3.6E-08	
			Total Rad + Chem	3.8E-08				Total Rad + Chem	3.9E-08	*Total:* 7.7E-08

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TABLE B.3.4-13(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.52E-05	2.8E-02		
PU-238	3.83E-08	7.0E-05		
PU-239/240	1.17E-08	2.1E-05		
RA-226	1.32E-04	2.4E-01		
RA-228	2.88E-05	5.3E-02		
SR-90	1.80E-04	3.3E-01		
TH-228	5.94E-07	1.1E-03		
TH-230	1.34E-05	2.5E-02		
TH-232	3.15E-06	5.8E-03		
U-234	8.68E-04	1.6E+00		
U-235/236	5.85E-05	1.1E-01		
U-238	1.59E-03	2.9E+00		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	1.4E-06	1.0E-02		
PU-238	7.7E-09	5.6E-05		
PU-239/240	2.3E-09	1.7E-05		
RA-226	2.4E-04	1.7E+00		
RA-228	5.2E-05	3.8E-01		
SR-90	9.0E-04	6.6E+00		
TH-228	5.0E-07	3.7E-03		
TH-230	1.1E-05	8.2E-02		
TH-232	2.6E-06	1.9E-02		
U-234	2.6E-03	1.9E+01		
U-235/236	1.8E-04	1.3E+00		
U-238	4.8E-03	3.5E+01		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.55E-06	4.7E-09	3.0E-04	1.6E-05
Benzo(a)anthracene	3.03E-07	3.1E-10		
Benzo(a)pyrene	7.54E-07	7.7E-10		
Benzo(b)fluoranthene	1.62E-06	1.7E-09		
Benzo(g,h,i)perylene	1.41E-05	1.4E-08		
Beryllium	3.20E-07	3.3E-10	5.0E-03	6.6E-08
Lead	7.91E-06	8.1E-09		
Dibenzo(a,h)anthracene	2.42E-06	2.5E-09		
Indeno(1,2,3-cd)pyrene	3.14E-06	3.2E-09		
TH-TOTAL	2.83E-08	2.9E-11		
Phenanthrene	3.27E-08	3.4E-11		

Total Pathway: 1.6E-05

Total Rad + Chem 1.6E-05

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.4E-07	5.6E-10	3.0E-04	1.9E-06
Benzo(a)anthracene	9.6E-08	4.0E-10		
Benzo(a)pyrene	2.4E-07	9.8E-10		
Benzo(b)fluoranthene	5.2E-07	2.1E-09		
Benzo(g,h,i)perylene	4.5E-06	1.8E-08		
Beryllium	2.9E-10	1.2E-12	5.0E-03	2.4E-10
Lead	6.6E-06	2.7E-08		
Dibenzo(a,h)anthracene	7.7E-07	3.2E-09		
Indeno(1,2,3-cd)pyrene	1.0E-06	4.1E-09		
TH-TOTAL	2.4E-08	9.7E-11		
Phenanthrene	1.1E-08	4.3E-11		

Total Pathway: 1.9E-06

Total Rad + Chem 1.9E-06

Total	
	1.7E-05
	6.6E-08
Total:	1.8E-05

TABLE B.3.4-13(a)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.26E-01	4.2E+02	1.3E-12	5.4E-10

Total Pathway: 5.4E-10

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.71E-01	2.0E+03	1.3E-12	2.6E-09

Total Pathway: 2.6E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem 5.4E-10

Total Rad + Chem 2.6E-09

	Total	Total Dust & Groundwater Affected
NP-237		8.4E-12
PU-238		2.8E-14
PU-239/240		8.9E-15
RA-226		1.5E-09
RA-228		4.4E-11
SR-90		2.5E-10
TH-228		2.6E-13
TH-230		1.4E-12
TH-232		4.3E-12
U-234		3.3E-10
U-235/236		2.2E-11
U-238		1.1E-09
TC-99	3.1E-09	3.1E-09
Benzo(a)anthracene		5.2E-10
Benzo(a)pyrene		1.3E-08
Benzo(b)fluoranthene		2.8E-09
Beryllium		1.4E-09
Dibenzo(a,h)anthracene		4.1E-08
Indeno(1,2,3-cd)pyrene		5.3E-09
Total:	3.1E-09	8.0E-08

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TABLE B.3.4-13(a)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.26E-01	4.2E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.7E-01	2.0E+03		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		1.7E-05
		6.6E-08

Total:	1.8E-05

TABLE B.3.4-13(b)
FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.52E-05	9.3E-04	2.2E-10	2.0E-13	NP-237	1.38E-06	2.0E-03	2.2E-10	4.3E-13	6.4E-13
PU-238	3.83E-08	2.3E-06	2.2E-10	5.1E-16	PU-238	7.67E-09	1.1E-05	2.2E-10	2.4E-15	2.9E-15
PU-239/240	1.17E-08	7.1E-07	2.3E-10	1.6E-16	PU-239/240	2.33E-09	3.3E-06	2.3E-10	7.7E-16	9.3E-16
RA-226	1.32E-04	8.0E-03	7.8E-10	6.3E-12	RA-226	2.37E-04	3.4E-01	7.8E-10	2.6E-10	2.7E-10
RA-228	2.88E-05	1.8E-03	1.0E-10	1.8E-13	RA-228	5.22E-05	7.5E-02	1.0E-10	7.5E-12	7.6E-12
SR-90	1.80E-04	1.1E-02	3.6E-11	4.0E-13	SR-90	9.04E-04	1.3E+00	3.6E-11	4.6E-11	4.7E-11
TH-228	5.94E-07	3.6E-05	5.5E-11	2.0E-15	TH-228	5.05E-07	7.2E-04	5.5E-11	4.0E-14	4.2E-14
TH-230	1.3E-05	8.2E-04	1.30E-11	1.1E-14	TH-230	1.12E-05	1.6E-02	1.3E-11	2.1E-13	2.2E-13
TH-232	3.15E-06	1.9E-04	1.7E-10	3.3E-14	TH-232	2.62E-06	3.7E-03	1.7E-10	6.4E-13	6.7E-13
U-234	8.68E-04	5.3E-02	1.6E-11	8.5E-13	U-234	2.60E-03	3.7E+00	1.6E-11	5.9E-11	6.0E-11
U-235/236	5.85E-05	3.6E-03	1.6E-11	5.7E-14	U-235/236	1.75E-04	2.5E-01	1.6E-11	4.0E-12	4.1E-12
U-238	1.59E-03	9.7E-02	2.8E-11	2.7E-12	U-238	4.78E-03	6.8E+00	2.8E-11	1.9E-10	1.9E-10
			Total Pathway:	1.1E-11				Total Pathway:	5.7E-10	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	4.55E-06	7.2E-10	1.8E+00	1.3E-09	Arsenic	1.36E-07	5.1E-10	1.8E+00	8.9E-10	2.2E-09
Benzo(a)anthracene	3.03E-07	4.8E-11	7.3E-01	3.5E-11	Benzo(a)anthracene	9.63E-08	3.6E-10	7.3E-01	2.6E-10	3.0E-10
Benzo(a)pyrene	7.54E-07	1.2E-10	7.3E+00	8.7E-10	Benzo(a)pyrene	2.40E-07	8.9E-10	7.3E+00	6.5E-09	7.4E-09
Benzo(b)fluoranthene	1.62E-06	2.6E-10	7.3E-01	1.9E-10	Benzo(b)fluoranthene	5.16E-07	1.9E-09	7.3E-01	1.4E-09	1.6E-09
Benzo(g,h,i)perylene	1.41E-05	2.2E-09			Benzo(g,h,i)perylene	4.47E-06	1.7E-08			
Beryllium	3.20E-07	5.1E-11	4.3E+00	2.2E-10	Beryllium	2.88E-10	1.1E-12	4.3E+00	4.6E-12	2.2E-10
Lead	7.91E-06	1.3E-09			Lead	6.59E-06	2.5E-08			
Dibenzo(a,h)anthracene	2.42E-06	3.8E-10	7.3E+00	2.8E-09	Dibenzo(a,h)anthracene	7.68E-07	2.9E-09	7.3E+00	2.1E-08	2.4E-08
Indeno(1,2,3-cd)pyrene	3.14E-06	5.0E-10	7.3E-01	3.6E-10	Indeno(1,2,3-cd)pyrene	9.96E-07	3.7E-09	7.3E-01	2.7E-09	3.1E-09
TH-TOTAL	2.83E-08	4.5E-12			TH-TOTAL	2.36E-08	8.8E-11			
Phenanthrene	3.27E-08	5.2E-12			Phenanthrene	1.05E-08	3.9E-11			
			Total Pathway:	5.8E-09				Total Pathway:	3.3E-08	

Total Rad + Chem 5.8E-09 | Total Rad + Chem 3.3E-08 | *Total:* 3.9E-08

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TABLE B.3.4-13(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.52E-05	9.3E-04		
PU-238	3.83E-08	2.3E-06		
PU-239/240	1.17E-08	7.1E-07		
RA-226	1.32E-04	8.0E-03		
RA-228	2.88E-05	1.8E-03		
SR-90	1.80E-04	1.1E-02		
TH-228	5.94E-07	3.6E-05		
TH-230	1.34E-05	8.2E-04		
TH-232	3.15E-06	1.9E-04		
U-234	8.68E-04	5.3E-02		
U-235/236	5.85E-05	3.6E-03		
U-238	1.59E-03	9.7E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	1.4E-06	2.0E-03		
PU-238	7.7E-09	1.1E-05		
PU-239/240	2.3E-09	3.3E-06		
RA-226	2.4E-04	3.4E-01		
RA-228	5.2E-05	7.5E-02		
SR-90	9.0E-04	1.3E+00		
TH-228	5.0E-07	7.2E-04		
TH-230	1.1E-05	1.6E-02		
TH-232	2.6E-06	3.7E-03		
U-234	2.6E-03	3.7E+00		
U-235/236	1.8E-04	2.5E-01		
U-238	4.8E-03	6.8E+00		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.55E-06	8.4E-09	3.0E-04	2.8E-05
Benzo(a)anthracene	3.03E-07	5.6E-10		
Benzo(a)pyrene	7.54E-07	1.4E-09		
Benzo(b)fluoranthene	1.62E-06	3.0E-09		
Benzo(g,h,i)perylene	1.41E-05	2.6E-08		
Beryllium	3.20E-07	5.9E-10	5.0E-03	1.2E-07
Lead	7.91E-06	1.5E-08		
Dibenzo(a,h)anthracene	2.42E-06	4.5E-09		
Indeno(1,2,3-cd)pyrene	3.14E-06	5.8E-09		
TH-TOTAL	2.83E-08	5.2E-11		
Phenanthrene	3.27E-08	6.1E-11		

Total Pathway: 2.8E-05

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.4E-07	5.9E-09	3.0E-04	2.0E-05
Benzo(a)anthracene	9.6E-08	4.2E-09		
Benzo(a)pyrene	2.4E-07	1.0E-08		
Benzo(b)fluoranthene	5.2E-07	2.2E-08		
Benzo(g,h,i)perylene	4.5E-06	1.9E-07		
Beryllium	2.9E-10	1.3E-11	5.0E-03	2.5E-09
Lead	6.6E-06	2.9E-07		
Dibenzo(a,h)anthracene	7.7E-07	3.3E-08		
Indeno(1,2,3-cd)pyrene	1.0E-06	4.3E-08		
TH-TOTAL	2.4E-08	1.0E-09		
Phenanthrene	1.1E-08	4.6E-10		

Total Pathway: 2.0E-05

Total Rad + Chem	2.8E-05	Total Rad + Chem	2.0E-05

Total	
	4.8E-05
	1.2E-07
Total:	4.8E-05

TABLE B.3.4-13(b)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.26E-01	1.4E+01	1.3E-12	1.8E-11

Total Pathway: 1.8E-11

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.71E-01	3.9E+02	1.3E-12	5.0E-10

Total Pathway: 5.0E-10

Total	Total Dust & Groundwater Affected
	6.4E-13
	2.9E-15
	9.3E-16
	2.7E-10
	7.6E-12
	4.7E-11
	4.2E-14
	2.2E-13
	6.7E-13
	6.0E-11
	4.1E-12
	1.9E-10
5.2E-10	5.2E-10

Chemical Risk

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

		2.2E-09	
		3.0E-10	
		7.4E-09	
		1.6E-09	
		2.2E-10	
		2.4E-08	
		3.1E-09	

Total Rad + Chem 1.8E-11

Total Rad + Chem 5.0E-10

Total:	5.2E-10	4.0E-08

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TABLE B.3.4-13(b)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.26E-01	1.4E+01		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.7E-01	3.9E+02		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		4.8E-05
		1.2E-07
Total:		4.8E-05

TABLE B.3.4-13(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	5.01E-07	9.2E-04	2.2E-10	2.0E-13	NP-237	4.56E-08	3.4E-04	2.2E-10	7.4E-14	2.8E-13
PU-238	1.26E-09	2.3E-06	2.2E-10	5.1E-16	PU-238	2.52E-10	1.9E-06	2.2E-10	4.1E-16	9.2E-16
PU-239/240	3.84E-10	7.1E-07	2.3E-10	1.6E-16	PU-239/240	7.68E-11	5.6E-07	2.3E-10	1.3E-16	2.9E-16
RA-226	4.41E-06	8.1E-03	7.8E-10	6.3E-12	RA-226	7.93E-06	5.8E-02	7.8E-10	4.5E-11	5.2E-11
RA-228	9.49E-07	1.7E-03	1.0E-10	1.7E-13	RA-228	1.72E-06	1.3E-02	1.0E-10	1.3E-12	1.4E-12
SR-90	5.96E-06	1.1E-02	3.6E-11	3.9E-13	SR-90	2.98E-05	2.2E-01	3.6E-11	7.9E-12	8.3E-12
TH-228	1.95E-08	3.6E-05	5.5E-11	2.0E-15	TH-228	1.66E-08	1.2E-04	5.5E-11	6.7E-15	8.7E-15
TH-230	4.42E-07	8.1E-04	1.3E-11	1.1E-14	TH-230	3.69E-07	2.7E-03	1.3E-11	3.5E-14	4.6E-14
TH-232	1.03E-07	1.9E-04	1.7E-10	3.2E-14	TH-232	8.62E-08	6.3E-04	1.7E-10	1.1E-13	1.4E-13
U-234	2.86E-05	5.2E-02	1.6E-11	8.4E-13	U-234	8.57E-05	6.3E-01	1.6E-11	1.0E-11	1.1E-11
U-235/236	1.92E-06	3.5E-03	1.6E-11	5.7E-14	U-235/236	5.77E-06	4.2E-02	1.6E-11	6.8E-13	7.3E-13
U-238	5.23E-05	9.6E-02	2.8E-11	2.7E-12	U-238	1.57E-04	1.2E+00	2.8E-11	3.2E-11	3.5E-11
			Total Pathway:	1.1E-11				Total Pathway:	9.8E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.50E-07	1.5E-10	1.8E+00	2.7E-10	Arsenic	4.49E-09	1.8E-11	1.8E+00	3.2E-11	3.0E-10
Benzo(a)anthracene	1.01E-08	1.0E-11	7.3E-01	7.6E-12	Benzo(a)anthracene	3.21E-09	1.3E-11	7.3E-01	9.6E-12	1.7E-11
Benzo(a)pyrene	2.48E-08	2.6E-11	7.3E+00	1.9E-10	Benzo(a)pyrene	7.89E-09	3.2E-11	7.3E+00	2.4E-10	4.2E-10
Benzo(b)fluoranthene	5.32E-08	5.5E-11	7.3E-01	4.0E-11	Benzo(b)fluoranthene	1.69E-08	7.0E-11	7.3E-01	5.1E-11	9.1E-11
Benzo(g,h,i)perylene	4.70E-07	4.8E-10			Benzo(g,h,i)perylene	1.49E-07	6.1E-10			
Beryllium	1.05E-08	1.1E-11	4.3E+00	4.7E-11	Beryllium	9.47E-12	3.9E-14	4.3E+00	1.7E-13	4.7E-11
Lead	2.61E-07	2.7E-10			Lead	2.17E-07	8.9E-10			
Dibenzo(a,h)anthracene	7.97E-08	8.2E-11	7.3E+00	6.0E-10	Dibenzo(a,h)anthracene	2.53E-08	1.0E-10	7.3E+00	7.6E-10	1.4E-09
Indeno(1,2,3-cd)pyrene	1.03E-07	1.1E-10	7.3E-01	7.7E-11	Indeno(1,2,3-cd)pyrene	3.28E-08	1.3E-10	7.3E-01	9.8E-11	1.8E-10
TH-TOTAL	9.46E-10	9.7E-13			TH-TOTAL	7.88E-10	3.2E-12			
Phenanthrene	1.09E-09	1.1E-12			Phenanthrene	3.51E-10	1.4E-12			
			Total Pathway:	1.2E-09				Total Pathway:	1.2E-09	
			Total Rad + Chem	1.2E-09				Total Rad + Chem	1.3E-09	*Total:* 2.5E-09

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TABLE B.3.4-13(c)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.01E-07	9.2E-04		
PU-238	1.26E-09	2.3E-06		
PU-239/240	3.84E-10	7.1E-07		
RA-226	4.41E-06	8.1E-03		
RA-228	9.49E-07	1.7E-03		
SR-90	5.96E-06	1.1E-02		
TH-228	1.95E-08	3.6E-05		
TH-230	4.42E-07	8.1E-04		
TH-232	1.03E-07	1.9E-04		
U-234	2.86E-05	5.2E-02		
U-235/236	1.92E-06	3.5E-03		
U-238	5.23E-05	9.6E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.6E-08	3.4E-04		
PU-238	2.5E-10	1.9E-06		
PU-239/240	7.7E-11	5.6E-07		
RA-226	7.9E-06	5.8E-02		
RA-228	1.7E-06	1.3E-02		
SR-90	3.0E-05	2.2E-01		
TH-228	1.7E-08	1.2E-04		
TH-230	3.7E-07	2.7E-03		
TH-232	8.6E-08	6.3E-04		
U-234	8.6E-05	6.3E-01		
U-235/236	5.8E-06	4.2E-02		
U-238	1.6E-04	1.2E+00		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.50E-07	1.5E-10	3.0E-04	5.1E-07
Benzo(a)anthracene	1.01E-08	1.0E-11		
Benzo(a)pyrene	2.48E-08	2.6E-11		
Benzo(b)fluoranthene	5.32E-08	5.5E-11		
Benzo(g,h,i)perylene	4.70E-07	4.8E-10		
Beryllium	1.05E-08	1.1E-11	5.0E-03	2.2E-09
Lead	2.61E-07	2.7E-10		
Dibenzo(a,h)anthracene	7.97E-08	8.2E-11		
Indeno(1,2,3-cd)pyrene	1.03E-07	1.1E-10		
TH-TOTAL	9.46E-10	9.7E-13		
Phenanthrene	1.09E-09	1.1E-12		

Total Pathway: 5.1E-07

Total Rad + Chem 5.1E-07

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	4.49E-09	1.8E-11	3.0E-04	6.1E-08
Benzo(a)anthracene	3.21E-09	1.3E-11		
Benzo(a)pyrene	7.89E-09	3.2E-11		
Benzo(b)fluoranthene	1.69E-08	7.0E-11		
Benzo(g,h,i)perylene	1.49E-07	6.1E-10		
Beryllium	9.47E-12	3.9E-14	5.0E-03	7.8E-12
Lead	2.17E-07	8.9E-10		
Dibenzo(a,h)anthracene	2.53E-08	1.0E-10		
Indeno(1,2,3-cd)pyrene	3.28E-08	1.3E-10		
TH-TOTAL	7.88E-10	3.2E-12		
Phenanthrene	3.51E-10	1.4E-12		

Total Pathway: 6.1E-08

Total Rad + Chem 6.1E-08

Total	
	5.7E-07
	2.2E-09
Total:	5.8E-07

TABLE B.3.4-13(c)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.26E-01	4.2E+02	1.3E-12	5.4E-10

Total Pathway: 5.4E-10

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.71E-01	2.0E+03	1.3E-12	2.6E-09

Total Pathway: 2.6E-09

Total	Total Dust & Groundwater Affected
	2.8E-13
	9.2E-16
	2.9E-16
	5.2E-11
	1.4E-12
	8.3E-12
	8.7E-15
	4.6E-14
	1.4E-13
	1.1E-11
	7.3E-13
	3.5E-11
3.1E-09	3.1E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total	Total Dust & Groundwater Affected
	1.7E-11
	4.2E-10
	9.1E-11
	1.8E-10

Total Rad + Chem 5.4E-10

Total Rad + Chem 2.6E-09

Total:	3.1E-09	3.9E-09

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TABLE B.3.4-13(c)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.26E-01	4.2E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.7E-01	2.0E+03		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

Total:

TABLE B.3.4-13(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	5.01E-07	3.1E-05	2.2E-10	6.7E-15	NP-237	4.56E-08	6.5E-05	2.2E-10	1.4E-14	2.1E-14
PU-238	1.26E-09	7.7E-08	2.2E-10	1.7E-17	PU-238	2.52E-10	3.6E-07	2.2E-10	7.9E-17	9.6E-17
PU-239/240	3.84E-10	2.3E-08	2.3E-10	5.4E-18	PU-239/240	7.68E-11	1.1E-07	2.3E-10	2.5E-17	3.1E-17
RA-226	4.41E-06	2.7E-04	7.8E-10	2.1E-13	RA-226	7.93E-06	1.1E-02	7.8E-10	8.8E-12	9.0E-12
RA-228	9.49E-07	5.8E-05	1.0E-10	5.8E-15	RA-228	1.72E-06	2.5E-03	1.0E-10	2.5E-13	2.5E-13
SR-90	5.96E-06	3.6E-04	3.6E-11	1.3E-14	SR-90	2.98E-05	4.3E-02	3.6E-11	1.5E-12	1.5E-12
TH-228	1.95E-08	1.2E-06	5.5E-11	6.5E-17	TH-228	1.66E-08	2.4E-05	5.5E-11	1.3E-15	1.4E-15
TH-230	4.42E-07	2.7E-05	1.3E-11	3.5E-16	TH-230	3.69E-07	5.3E-04	1.3E-11	6.8E-15	7.2E-15
TH-232	1.03E-07	6.3E-06	1.7E-10	1.1E-15	TH-232	8.62E-08	1.2E-04	1.7E-10	2.1E-14	2.2E-14
U-234	2.86E-05	1.7E-03	1.6E-11	2.8E-14	U-234	8.57E-05	1.2E-01	1.6E-11	2.0E-12	2.0E-12
U-235/236	1.92E-06	1.2E-04	1.6E-11	1.9E-15	U-235/236	5.77E-06	8.2E-03	1.6E-11	1.3E-13	1.3E-13
U-238	5.23E-05	3.2E-03	2.8E-11	8.9E-14	U-238	1.57E-04	2.2E-01	2.8E-11	6.3E-12	6.4E-12
			Total Pathway:	3.6E-13				Total Pathway:	1.9E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.50E-07	2.4E-11	1.8E+00	4.2E-11	Arsenic	4.49E-09	1.7E-11	1.8E+00	2.9E-11	7.1E-11
Benzo(a)anthracene	1.01E-08	1.6E-12	7.3E-01	1.2E-12	Benzo(a)anthracene	3.21E-09	1.2E-11	7.3E-01	8.7E-12	9.9E-12
Benzo(a)pyrene	2.48E-08	3.9E-12	7.3E+00	2.9E-11	Benzo(a)pyrene	7.89E-09	2.9E-11	7.3E+00	2.1E-10	2.4E-10
Benzo(b)fluoranthene	5.32E-08	8.5E-12	7.3E-01	6.2E-12	Benzo(b)fluoranthene	1.69E-08	6.3E-11	7.3E-01	4.6E-11	5.2E-11
Benzo(g,h,i)perylene	4.70E-07	7.5E-11			Benzo(g,h,i)perylene	1.49E-07	5.6E-10			
Beryllium	1.05E-08	1.7E-12	4.3E+00	7.2E-12	Beryllium	9.47E-12	3.5E-14	4.3E+00	1.5E-13	7.3E-12
Lead	2.61E-07	4.1E-11			Lead	2.17E-07	8.1E-10			
Dibenzo(a,h)anthracene	7.97E-08	1.3E-11	7.3E+00	9.2E-11	Dibenzo(a,h)anthracene	2.53E-08	9.4E-11	7.3E+00	6.9E-10	7.8E-10
Indeno(1,2,3-cd)pyrene	1.03E-07	1.6E-11	7.3E-01	1.2E-11	Indeno(1,2,3-cd)pyrene	3.28E-08	1.2E-10	7.3E-01	8.9E-11	1.0E-10
TH-TOTAL	9.46E-10	1.5E-13			TH-TOTAL	7.88E-10	2.9E-12			
Phenanthrene	1.09E-09	1.7E-13			Phenanthrene	3.51E-10	1.3E-12			
			Total Pathway:	1.9E-10				Total Pathway:	1.1E-09	
			Total Rad + Chem	1.9E-10				Total Rad + Chem	1.1E-09	*Total:* 1.3E-09

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TABLE B.3.4-13(d)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.01E-07	3.1E-05		
PU-238	1.26E-09	7.7E-08		
PU-239/240	3.84E-10	2.3E-08		
RA-226	4.41E-06	2.7E-04		
RA-228	9.49E-07	5.8E-05		
SR-90	5.96E-06	3.6E-04		
TH-228	1.95E-08	1.2E-06		
TH-230	4.42E-07	2.7E-05		
TH-232	1.03E-07	6.3E-06		
U-234	2.86E-05	1.7E-03		
U-235/236	1.92E-06	1.2E-04		
U-238	5.23E-05	3.2E-03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	4.6E-08	6.5E-05		
PU-238	2.5E-10	3.6E-07		
PU-239/240	7.7E-11	1.1E-07		
RA-226	7.9E-06	1.1E-02		
RA-228	1.7E-06	2.5E-03		
SR-90	3.0E-05	4.3E-02		
TH-228	1.7E-08	2.4E-05		
TH-230	3.7E-07	5.3E-04		
TH-232	8.6E-08	1.2E-04		
U-234	8.6E-05	1.2E-01		
U-235/236	5.8E-06	8.2E-03		
U-238	1.6E-04	2.2E-01		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.50E-07	2.8E-10	3.0E-04	9.2E-07
Benzo(a)anthracene	1.01E-08	1.9E-11		
Benzo(a)pyrene	2.48E-08	4.6E-11		
Benzo(b)fluoranthene	5.32E-08	9.9E-11		
Benzo(g,h,i)perylene	4.70E-07	8.7E-10		
Beryllium	1.05E-08	2.0E-11	5.0E-03	3.9E-09
Lead	2.61E-07	4.8E-10		
Dibenzo(a,h)anthracene	7.97E-08	1.5E-10		
Indeno(1,2,3-cd)pyrene	1.03E-07	1.9E-10		
TH-TOTAL	9.46E-10	1.8E-12		
Phenanthrene	1.09E-09	2.0E-12		

Total Pathway: 9.3E-07

Total Rad + Chem 9.3E-07

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	4.49E-09	2.0E-10	3.0E-04	6.5E-07
Benzo(a)anthracene	3.21E-09	1.4E-10		
Benzo(a)pyrene	7.89E-09	3.4E-10		
Benzo(b)fluoranthene	1.69E-08	7.4E-10		
Benzo(g,h,i)perylene	1.49E-07	6.5E-09		
Beryllium	9.47E-12	4.1E-13	5.0E-03	8.2E-11
Lead	2.17E-07	9.4E-09		
Dibenzo(a,h)anthracene	2.53E-08	1.1E-09		
Indeno(1,2,3-cd)pyrene	3.28E-08	1.4E-09		
TH-TOTAL	7.88E-10	3.4E-11		
Phenanthrene	3.51E-10	1.5E-11		

Total Pathway: 6.5E-07

Total Rad + Chem 6.5E-07

Total
1.6E-06
4.0E-09

Total: 1.6E-06

TABLE B.3.4-13(d)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.26E-01	1.4E+01	1.3E-12	1.8E-11

Total Pathway: 1.8E-11

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.71E-01	3.9E+02	1.3E-12	5.0E-10

Total Pathway: 5.0E-10

Total	Total Dust & Groundwater Affected
	2.1E-14
	9.6E-17
	3.1E-17
	9.0E-12
	2.5E-13
	1.5E-12
	1.4E-15
	7.2E-15
	2.2E-14
	2.0E-12
	1.3E-13
	6.4E-12
5.2E-10	5.2E-10

Chemical Risk

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

		9.9E-12	
		2.4E-10	
		5.2E-11	
		1.0E-10	

Total Rad + Chem 1.8E-11

Total Rad + Chem 5.0E-10

Total:	5.2E-10	9.5E-10

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TABLE B.3.4-13(d)
(continued)

SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Non-carcinogenic Hazard

	Total	Total Dust & Groundwater Affected

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.26E-01	1.4E+01		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.7E-01	3.9E+02		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

Total:

TABLE B.3.4-14(a)

FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	1.03E-06	2.0E+00	2.2E-10	4.4E-10	NP-237	1.03E-06	1.1E+00	2.2E-10	2.4E-10	6.8E-10
PU-238	5.69E-07	1.1E+00	2.2E-10	2.5E-10	PU-238	5.68E-07	5.9E-01	2.2E-10	1.3E-10	3.8E-10
PU-239/240	6.08E-08	1.2E-01	2.3E-10	2.8E-11	PU-239/240	6.08E-08	6.4E-02	2.3E-10	1.5E-11	4.2E-11
RA-226	1.24E-06	2.4E+00	7.8E-10	1.9E-09	RA-226	1.24E-06	1.3E+00	7.8E-10	1.0E-09	2.9E-09
RA-228	1.24E-06	2.4E+00	1.0E-10	2.4E-10	RA-228	1.23E-06	1.3E+00	1.0E-10	1.3E-10	3.7E-10
SR-90	1.16E-06	2.3E+00	3.6E-11	8.2E-11	SR-90	1.16E-06	1.2E+00	3.6E-11	4.4E-11	1.3E-10
TH-228	1.19E-06	2.3E+00	5.5E-11	1.3E-10	TH-228	1.16E-06	1.2E+00	5.5E-11	6.7E-11	2.0E-10
TH-230	4.87E-06	9.6E+00	1.3E-11	1.2E-10	TH-230	4.87E-06	5.1E+00	1.3E-11	6.6E-11	1.9E-10
TH-232	1.14E-06	2.2E+00	1.7E-10	3.8E-10	TH-232	1.14E-06	1.2E+00	1.7E-10	2.0E-10	5.8E-10
U-234	3.39E-05	6.7E+01	1.6E-11	1.1E-09	U-234	3.39E-05	3.5E+01	1.6E-11	5.7E-10	1.6E-09
U-235/236	2.29E-06	4.5E+00	1.6E-11	7.2E-11	U-235/236	2.29E-06	2.4E+00	1.6E-11	3.8E-11	1.1E-10
U-238	6.23E-05	1.2E+02	2.8E-11	3.4E-09	U-238	6.23E-05	6.5E+01	2.8E-11	1.8E-09	5.3E-09
		Total Pathway:		8.2E-09			Total Pathway:		4.3E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	6.79E-06	7.5E-09	1.8E+00	1.3E-08	Arsenic	6.79E-06	4.0E-09	1.8E+00	6.9E-09	2.0E-08
Benzo(a)anthracene	2.86E-07	3.1E-10	7.3E-01	2.3E-10	Benzo(a)anthracene	2.84E-07	1.7E-10	7.3E-01	1.2E-10	3.5E-10
Benzo(a)pyrene	2.60E-07	2.9E-10	7.3E+00	2.1E-09	Benzo(a)pyrene	2.59E-07	1.5E-10	7.3E+00	1.1E-09	3.2E-09
Benzo(b)fluoranthene	5.42E-07	6.0E-10	7.3E-01	4.4E-10	Benzo(b)fluoranthene	5.37E-07	3.1E-10	7.3E-01	2.3E-10	6.6E-10
Benzo(g,h,i)perylene	3.65E-07	4.0E-10			Benzo(g,h,i)perylene	3.62E-07	2.1E-10			
Beryllium	6.91E-07	7.6E-10	4.3E+00	3.3E-09	Beryllium	6.91E-07	4.0E-10	4.3E+00	1.7E-09	5.0E-09
Lead	4.92E-05	5.4E-08			Lead	4.92E-05	2.9E-08			
Dibenzo(a,h)anthracene	1.50E-07	1.7E-10	7.3E+00	1.2E-09	Dibenzo(a,h)anthracene	1.49E-07	8.7E-11	7.3E+00	6.4E-10	1.8E-09
Indeno(1,2,3-cd)pyrene	3.60E-07	4.0E-10	7.3E-01	2.9E-10	Indeno(1,2,3-cd)pyrene	3.58E-07	2.1E-10	7.3E-01	1.5E-10	4.4E-10
TH-TOTAL	1.02E-05	1.1E-08			TH-TOTAL	1.02E-05	6.0E-09			
Phenanthrene	4.11E-07	4.5E-10			Phenanthrene	4.01E-07	2.3E-10			
		Total Pathway:		2.1E-08			Total Pathway:		1.1E-08	
		Total Rad + Chem		2.9E-08			Total Rad + Chem		1.5E-08	*Total:* 4.4E-08

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NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.0E-06	2.0E+00		
PU-238	5.7E-07	1.1E+00		
PU-239/240	6.1E-08	1.2E-01		
RA-226	1.2E-06	2.4E+00		
RA-228	1.2E-06	2.4E+00		
SR-90	1.2E-06	2.3E+00		
TH-228	1.2E-06	2.3E+00		
TH-230	4.9E-06	9.6E+00		
TH-232	1.1E-06	2.2E+00		
U-234	3.4E-05	6.7E+01		
U-235/236	2.3E-06	4.5E+00		
U-238	6.2E-05	1.2E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.03E-06	1.1E+00		
PU-238	5.68E-07	5.9E-01		
PU-239/240	6.08E-08	6.4E-02		
RA-226	1.24E-06	1.3E+00		
RA-228	1.23E-06	1.3E+00		
SR-90	1.16E-06	1.2E+00		
TH-228	1.16E-06	1.2E+00		
TH-230	4.87E-06	5.1E+00		
TH-232	1.14E-06	1.2E+00		
U-234	3.39E-05	3.5E+01		
U-235/236	2.29E-06	2.4E+00		
U-238	6.23E-05	6.5E+01		

Total Pathway:

Total Rad + Chem

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.8E-06	7.5E-09	3.0E-04	2.5E-05
Benzo(a)anthracene	2.9E-07	3.1E-10		
Benzo(a)pyrene	2.6E-07	2.9E-10		
Benzo(b)fluoranthene	5.4E-07	6.0E-10		
Benzo(g,h,i)perylene	3.7E-07	4.0E-10		
Beryllium	6.9E-07	7.6E-10	5.0E-03	1.5E-07
Lead	4.9E-05	5.4E-08		
Dibenzo(a,h)anthracene	1.5E-07	1.7E-10		
Indeno(1,2,3-cd)pyrene	3.6E-07	4.0E-10		
TH-TOTAL	1.0E-05	1.1E-08		
Phenanthrene	4.1E-07	4.5E-10		

Total Pathway: 2.5E-05

Total Rad + Chem 2.5E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.79E-06	4.0E-09	3.0E-04	1.3E-05
Benzo(a)anthracene	2.84E-07	1.7E-10		
Benzo(a)pyrene	2.59E-07	1.5E-10		
Benzo(b)fluoranthene	5.37E-07	3.1E-10		
Benzo(g,h,i)perylene	3.62E-07	2.1E-10		
Beryllium	6.91E-07	4.0E-10	5.0E-03	8.1E-08
Lead	4.92E-05	2.9E-08		
Dibenzo(a,h)anthracene	1.49E-07	8.7E-11		
Indeno(1,2,3-cd)pyrene	3.58E-07	2.1E-10		
TH-TOTAL	1.02E-05	6.0E-09		
Phenanthrene	4.01E-07	2.3E-10		

Total Pathway: 1.3E-05

Total Rad + Chem 1.3E-05

Total	
	3.8E-05
	2.3E-07
Total:	3.8E-05

TABLE B.3.4-14(a)

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwate Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			6.8E-10
PU-238			2.2E-10		PU-238			2.2E-10			3.8E-10
PU-239/240			2.3E-10		PU-239/240			2.3E-10			4.2E-11
RA-226			7.8E-10		RA-226			7.8E-10			2.9E-09
RA-228			1.0E-10		RA-228			1.0E-10			3.7E-10
SR-90			3.6E-11		SR-90			3.6E-11			1.3E-10
TH-228			5.5E-11		TH-228			5.5E-11			2.0E-10
TH-230			1.3E-11		TH-230			1.3E-11			1.9E-10
TH-232			1.7E-10		TH-232			1.7E-10			5.8E-10
U-234			1.6E-11		U-234			1.6E-11			1.6E-09
U-235/236			1.6E-11		U-235/236			1.6E-11			1.1E-10
U-238			2.8E-11		U-238			2.8E-11			5.3E-09
TC-99	2.94E-04	5.8E+02	1.3E-12	7.5E-10	TC-99	2.94E-04	3.1E+02	1.3E-12	4.0E-10	1.2E-09	1.2E-09
			Total Pathway:	7.5E-10				Total Pathway:	4.0E-10		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			2.0E-08
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			3.5E-10
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			3.2E-09
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			6.6E-10
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			4.3E+00		Beryllium			4.3E+00			5.0E-09
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			1.8E-09
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			4.4E-10
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	7.5E-10				Total Rad + Chem	4.0E-10	*Total:* 1.2E-09	4.5E-08

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TABLE B.3.4-14(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	2.9E-04	5.8E+02			TC-99	2.94E-04	3.1E+02				
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Arsenic			3.0E-04		Arsenic			3.0E-04			3.8E-05
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			5.0E-03		Beryllium			5.0E-03			2.3E-07
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
		Total Pathway:					Total Pathway:				
		Total Rad + Chem					Total Rad + Chem			*Total:*	3.8E-05

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TABLE B.3.4-14(b)

FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.03E-06	8.6E-02	2.2E-10	1.9E-11
PU-238	5.69E-07	4.8E-02	2.2E-10	1.1E-11
PU-239/240	6.08E-08	5.1E-03	2.3E-10	1.2E-12
RA-226	1.24E-06	1.0E-01	7.8E-10	8.1E-11
RA-228	1.24E-06	1.0E-01	1.0E-10	
SR-90	1.16E-06	9.8E-02	3.6E-11	3.5E-12
TH-228	1.19E-06	1.0E-01	5.5E-11	5.5E-12
TH-230	4.87E-06	4.1E-01	1.3E-11	5.3E-12
TH-232	1.14E-06	9.6E-02	1.7E-10	1.6E-11
U-234	3.39E-05	2.9E+00	1.6E-11	4.6E-11
U-235/236	2.29E-06	1.9E-01	1.6E-11	3.1E-12
U-238	6.23E-05	5.2E+00	2.8E-11	1.5E-10

Total Pathway: 3.4E-10

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.03E-06	1.3E-01	2.2E-10	2.9E-11
PU-238	5.68E-07	7.3E-02	2.2E-10	1.6E-11
PU-239/240	6.08E-08	7.8E-03	2.3E-10	1.8E-12
RA-226	1.24E-06	1.6E-01	7.8E-10	1.2E-10
RA-228	1.23E-06	1.6E-01	1.0E-10	1.6E-11
SR-90	1.16E-06	1.5E-01	3.6E-11	5.4E-12
TH-228	1.16E-06	1.5E-01	5.5E-11	8.2E-12
TH-230	4.87E-06	6.3E-01	1.3E-11	8.1E-12
TH-232	1.14E-06	1.5E-01	1.7E-10	2.5E-11
U-234	3.39E-05	4.4E+00	1.6E-11	7.0E-11
U-235/236	2.29E-06	2.9E-01	1.6E-11	4.7E-12
U-238	6.23E-05	8.0E+00	2.8E-11	2.2E-10

Total Pathway: 5.3E-10

Total
4.8E-11
2.7E-11
3.0E-12
2.1E-10
1.6E-11
8.9E-12
1.4E-11
1.3E-11
4.1E-11
1.2E-10
7.8E-12
3.7E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.79E-06	1.5E-09	1.8E+00	2.6E-09
Benzo(a)anthracene	2.86E-07	6.3E-11	7.3E-01	4.6E-11
Benzo(a)pyrene	2.60E-07	5.7E-11	7.3E+00	4.2E-10
Benzo(b)fluoranthene	5.42E-07	1.2E-10	7.3E-01	8.7E-11
Benzo(g,h,i)perylene	3.65E-07	8.0E-11		
Beryllium	6.91E-07	1.5E-10	4.3E+00	6.5E-10
Lead	4.92E-05	1.1E-08		
Dibenzo(a,h)anthracene	1.50E-07	3.3E-11	7.3E+00	2.4E-10
Indeno(1,2,3-cd)pyrene	3.60E-07	7.9E-11	7.3E-01	5.8E-11
TH-TOTAL	1.02E-05	2.2E-09		
Phenanthrene	4.11E-07	9.0E-11		

Total Pathway: 4.1E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.79E-06	2.3E-09	1.8E+00	4.0E-09
Benzo(a)anthracene	2.84E-07	9.5E-11	7.3E-01	6.9E-11
Benzo(a)pyrene	2.59E-07	8.7E-11	7.3E+00	6.3E-10
Benzo(b)fluoranthene	5.37E-07	1.8E-10	7.3E-01	1.3E-10
Benzo(g,h,i)perylene	3.62E-07	1.2E-10		
Beryllium	6.91E-07	2.3E-10	4.3E+00	1.0E-09
Lead	4.92E-05	1.6E-08		
Dibenzo(a,h)anthracene	1.49E-07	5.0E-11	7.3E+00	3.7E-10
Indeno(1,2,3-cd)pyrene	3.58E-07	1.2E-10	7.3E-01	8.8E-11
TH-TOTAL	1.02E-05	3.4E-09		
Phenanthrene	4.01E-07	1.3E-10		

Total Pathway: 6.3E-09

Total
6.6E-09
1.2E-10
1.0E-09
2.2E-10
1.6E-09
6.1E-10
1.5E-10

Total Rad + Chem 4.4E-09

Total Rad + Chem 6.8E-09 *Total:* 1.1E-08

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TABLE B.3.4-14(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237	1.0E-06	8.6E-02			NP-237	1.03E-06	1.3E-01			
PU-238	5.7E-07	4.8E-02			PU-238	5.68E-07	7.3E-02			
PU-239/240	6.1E-08	5.1E-03			PU-239/240	6.08E-08	7.8E-03			
RA-226	1.2E-06	1.0E-01			RA-226	1.24E-06	1.6E-01			
RA-228	1.2E-06	1.0E-01			RA-228	1.23E-06	1.6E-01			
SR-90	1.2E-06	9.8E-02			SR-90	1.16E-06	1.5E-01			
TH-228	1.2E-06	1.0E-01			TH-228	1.16E-06	1.5E-01			
TH-230	4.9E-06	4.1E-01			TH-230	4.87E-06	6.3E-01			
TH-232	1.1E-06	9.6E-02			TH-232	1.14E-06	1.5E-01			
U-234	3.4E-05	2.9E+00			U-234	3.39E-05	4.4E+00			
U-235/236	2.3E-06	1.9E-01			U-235/236	2.29E-06	2.9E-01			
U-238	6.2E-05	5.2E+00			U-238	6.23E-05	8.0E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	6.8E-06	1.7E-08	3.0E-04	5.8E-05	Arsenic	6.79E-06	2.7E-08	3.0E-04	8.9E-05	1.5E-04
Benzo(a)anthracene	2.9E-07	7.3E-10			Benzo(a)anthracene	2.84E-07	1.1E-09			
Benzo(a)pyrene	2.6E-07	6.7E-10			Benzo(a)pyrene	2.59E-07	1.0E-09			
Benzo(b)fluoranthene	5.4E-07	1.4E-09			Benzo(b)fluoranthene	5.37E-07	2.1E-09			
Benzo(g,h,i)perylene	3.7E-07	9.3E-10			Benzo(g,h,i)perylene	3.62E-07	1.4E-09			
Beryllium	6.9E-07	1.8E-09	5.0E-03	3.5E-07	Beryllium	6.91E-07	2.7E-09	5.0E-03	5.4E-07	8.9E-07
Lead	4.9E-05	1.3E-07			Lead	4.92E-05	1.9E-07			
Dibenzo(a,h)anthracene	1.5E-07	3.8E-10			Dibenzo(a,h)anthracene	1.49E-07	5.8E-10			
Indeno(1,2,3-cd)pyrene	3.6E-07	9.2E-10			Indeno(1,2,3-cd)pyrene	3.58E-07	1.4E-09			
TH-TOTAL	1.0E-05	2.6E-08			TH-TOTAL	1.02E-05	4.0E-08			
Phenanthrene	4.1E-07	1.1E-09			Phenanthrene	4.01E-07	1.6E-09			
		Total Pathway:		5.8E-05			Total Pathway:		8.9E-05	
		Total Rad + Chem		5.8E-05			Total Rad + Chem		8.9E-05	*Total:* 1.5E-04

TABLE B.3.4-14(b)

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwate Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			4.8E-11
PU-238			2.2E-10		PU-238			2.2E-10			2.7E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			3.0E-12
RA-226			7.8E-10		RA-226			7.8E-10			2.1E-10
RA-228			1.0E-10		RA-228			1.0E-10			1.6E-11
SR-90			3.6E-11		SR-90			3.6E-11			8.9E-12
TH-228			5.5E-11		TH-228			5.5E-11			1.4E-11
TH-230			1.3E-11		TH-230			1.3E-11			1.3E-11
TH-232			1.7E-10		TH-232			1.7E-10			4.1E-11
U-234			1.6E-11		U-234			1.6E-11			1.2E-10
U-235/236			1.6E-11		U-235/236			1.6E-11			7.8E-12
U-238			2.8E-11		U-238			2.8E-11			3.7E-10
TC-99	2.94E-04	2.5E+01	1.3E-12	3.2E-11	TC-99	2.94E-04	3.8E+01	1.3E-12	4.9E-11	8.1E-11	8.1E-11
			Total Pathway:	3.2E-11				Total Pathway:	4.9E-11		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit				
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00		Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Beryllium			4.3E+00		Beryllium			4.3E+00	
Lead					Lead				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL					TH-TOTAL				
Phenanthrene					Phenanthrene				
			Total Pathway:					Total Pathway:	

			Total Rad + Chem	3.2E-11		Total Rad + Chem	4.9E-11

Total:	8.1E-11	1.1E-08

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TABLE B.3.4-14(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	2.9E-04	2.5E+01			TC-99	2.94E-04	3.8E+01				
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Arsenic			3.0E-04		Arsenic			3.0E-04			1.5E-04
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			5.0E-03		Beryllium			5.0E-03			8.9E-07
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
			Total Pathway:					Total Pathway:			

Total Rad + Chem

Total Rad + Chem

Total:	1.5E-04

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TABLE B.3.4-14(c)

FUTURE OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.39E-08	6.7E-02	2.2E-10	1.5E-11
PU-238	1.87E-08	3.7E-02	2.2E-10	8.1E-12
PU-239/240	2.00E-09	3.9E-03	2.3E-10	9.1E-13
RA-226	4.14E-08	8.2E-02	7.8E-10	6.4E-11
RA-228	4.08E-08	8.0E-02	1.0E-10	
SR-90	3.84E-08	7.6E-02	3.6E-11	2.7E-12
TH-228	3.93E-08	7.7E-02	5.5E-11	4.3E-12
TH-230	1.61E-07	3.2E-01	1.3E-11	4.1E-12
TH-232	3.74E-08	7.4E-02	1.7E-10	1.3E-11
U-234	1.12E-06	2.2E+00	1.6E-11	3.5E-11
U-235/236	7.52E-08	1.5E-01	1.6E-11	2.4E-12
U-238	2.05E-06	4.0E+00	2.8E-11	1.1E-10

Total Pathway: 2.6E-10

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	3.39E-08	3.5E-02	2.2E-10	7.8E-12
PU-238	1.87E-08	1.9E-02	2.2E-10	4.3E-12
PU-239/240	2.00E-09	2.1E-03	2.3E-10	4.8E-13
RA-226	4.14E-08	4.3E-02	7.8E-10	3.4E-11
RA-228	4.04E-08	4.2E-02	1.0E-10	4.2E-12
SR-90	3.83E-08	4.0E-02	3.6E-11	1.4E-12
TH-228	3.81E-08	4.0E-02	5.5E-11	2.2E-12
TH-230	1.61E-07	1.7E-01	1.3E-11	2.2E-12
TH-232	3.74E-08	3.9E-02	1.7E-10	6.6E-12
U-234	1.12E-06	1.2E+00	1.6E-11	1.9E-11
U-235/236	7.52E-08	7.8E-02	1.6E-11	1.3E-12
U-238	2.05E-06	2.1E+00	2.8E-11	6.0E-11

Total Pathway: 1.4E-10

Total
2.2E-11
1.2E-11
1.4E-12
9.7E-11
4.2E-12
4.2E-12
6.4E-12
6.3E-12
1.9E-11
5.4E-11
3.6E-12
1.7E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.23E-07	2.5E-10	1.8E+00	4.3E-10
Benzo(a)anthracene	9.54E-09	1.1E-11	7.3E-01	7.7E-12
Benzo(a)pyrene	8.58E-09	9.4E-12	7.3E+00	6.9E-11
Benzo(b)fluoranthene	1.78E-08	2.0E-11	7.3E-01	1.4E-11
Benzo(g,h,i)perylene	1.22E-08	1.3E-11		
Beryllium	2.27E-08	2.5E-11	4.3E+00	1.1E-10
Lead	1.62E-06	1.8E-09		
Dibenzo(a,h)anthracene	4.94E-09	5.4E-12	7.3E+00	4.0E-11
Indeno(1,2,3-cd)pyrene	1.19E-08	1.3E-11	7.3E-01	9.5E-12
TH-TOTAL	3.42E-07	3.8E-10		
Phenanthrene	1.37E-08	1.5E-11		

Total Pathway: 6.8E-10

Total Rad + Chem 9.4E-10

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.23E-07	1.3E-10	1.8E+00	2.3E-10
Benzo(a)anthracene	9.48E-09	5.5E-12	7.3E-01	4.0E-12
Benzo(a)pyrene	8.52E-09	5.0E-12	7.3E+00	3.6E-11
Benzo(b)fluoranthene	1.76E-08	1.0E-11	7.3E-01	7.5E-12
Benzo(g,h,i)perylene	1.21E-08	7.1E-12		
Beryllium	2.27E-08	1.3E-11	4.3E+00	5.7E-11
Lead	1.62E-06	9.5E-10		
Dibenzo(a,h)anthracene	4.91E-09	2.9E-12	7.3E+00	2.1E-11
Indeno(1,2,3-cd)pyrene	1.18E-08	6.9E-12	7.3E-01	5.0E-12
TH-TOTAL	3.42E-07	2.0E-10		
Phenanthrene	1.34E-08	7.8E-12		

Total Pathway: 3.6E-10

Total Rad + Chem 5.0E-10

Total
6.6E-10
1.2E-11
1.1E-10
2.2E-11
1.6E-10
6.1E-11
1.5E-11

Total: 1.4E-09

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TABLE B.3.4-14(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.39E-08	6.7E-02		
PU-238	1.87E-08	3.7E-02		
PU-239/240	2.00E-09	3.9E-03		
RA-226	4.14E-08	8.2E-02		
RA-228	4.08E-08	8.0E-02		
SR-90	3.84E-08	7.6E-02		
TH-228	3.93E-08	7.7E-02		
TH-230	1.61E-07	3.2E-01		
TH-232	3.74E-08	7.4E-02		
U-234	1.12E-06	2.2E+00		
U-235/236	7.52E-08	1.5E-01		
U-238	2.05E-06	4.0E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.39E-08	3.5E-02		
PU-238	1.87E-08	1.9E-02		
PU-239/240	2.00E-09	2.1E-03		
RA-226	4.14E-08	4.3E-02		
RA-228	4.04E-08	4.2E-02		
SR-90	3.83E-08	4.0E-02		
TH-228	3.81E-08	4.0E-02		
TH-230	1.61E-07	1.7E-01		
TH-232	3.74E-08	3.9E-02		
U-234	1.12E-06	1.2E+00		
U-235/236	7.52E-08	7.8E-02		
U-238	2.05E-06	2.1E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.23E-07	2.5E-10	3.0E-04	8.2E-07
Benzo(a)anthracene	9.54E-09	1.1E-11		
Benzo(a)pyrene	8.58E-09	9.4E-12		
Benzo(b)fluoranthene	1.78E-08	2.0E-11		
Benzo(g,h,i)perylene	1.22E-08	1.3E-11		
Beryllium	2.27E-08	2.5E-11	5.0E-03	5.0E-09
Lead	1.62E-06	1.8E-09		
Dibenzo(a,h)anthracene	4.94E-09	5.4E-12		
Indeno(1,2,3-cd)pyrene	1.19E-08	1.3E-11		
TH-TOTAL	3.42E-07	3.8E-10		
Phenanthrene	1.37E-08	1.5E-11		

Total Pathway: 8.2E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.23E-07	1.3E-10	3.0E-04	4.3E-07
Benzo(a)anthracene	9.48E-09	5.5E-12		
Benzo(a)pyrene	8.52E-09	5.0E-12		
Benzo(b)fluoranthene	1.76E-08	1.0E-11		
Benzo(g,h,i)perylene	1.21E-08	7.1E-12		
Beryllium	2.27E-08	1.3E-11	5.0E-03	6.6E-14
Lead	1.62E-06	9.5E-10		
Dibenzo(a,h)anthracene	4.91E-09	2.9E-12		
Indeno(1,2,3-cd)pyrene	1.18E-08	6.9E-12		
TH-TOTAL	3.42E-07	2.0E-10		
Phenanthrene	1.34E-08	7.8E-12		

Total Pathway: 4.3E-07

Total Rad + Chem	8.2E-07		1.3E-06
Total Rad + Chem	4.3E-07	*Total:*	1.3E-06

TABLE B.3.4-14(c)

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwate Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			2.2E-11
PU-238			2.2E-10		PU-238			2.2E-10			1.2E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.4E-12
RA-226			7.8E-10		RA-226			7.8E-10			9.7E-11
RA-228			1.0E-10		RA-228			1.0E-10			4.2E-12
SR-90			3.6E-11		SR-90			3.6E-11			4.2E-12
TH-228			5.5E-11		TH-228			5.5E-11			6.4E-12
TH-230			1.3E-11		TH-230			1.3E-11			6.3E-12
TH-232			1.7E-10		TH-232			1.7E-10			1.9E-11
U-234			1.6E-11		U-234			1.6E-11			5.4E-11
U-235/236			1.6E-11		U-235/236			1.6E-11			3.6E-12
U-238			2.8E-11		U-238			2.8E-11			1.7E-10
TC-99	2.94E-04	5.8E+02	1.3E-12	7.5E-10	TC-99	2.94E-04	3.1E+02	1.3E-12	4.0E-10	1.2E-09	1.2E-09
		Total Pathway:		7.5E-10			Total Pathway:		4.0E-10		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			6.6E-10
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			1.2E-11
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			1.1E-10
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			2.2E-11
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			4.3E+00		Beryllium			4.3E+00			1.6E-10
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			6.1E-11
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			1.5E-11
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
		Total Pathway:					Total Pathway:				
		Total Rad + Chem		7.5E-10			Total Rad + Chem		4.0E-10	*Total:* 1.2E-09	2.6E-09

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TABLE B.3.4-14(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.9E-04	5.8E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.94E-04	3.1E+02		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		1.3E-06
		5.0E-09
Total:		1.3E-06

TABLE B.3.4-14(d)

FUTURE OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	3.39E-08	2.8E-03	2.2E-10	6.3E-13	NP-237	3.39E-08	4.4E-03	2.2E-10	9.6E-13	1.6E-12
PU-238	1.87E-08	1.6E-03	2.2E-10	3.5E-13	PU-238	1.87E-08	2.4E-03	2.2E-10	5.3E-13	8.7E-13
PU-239/240	2.00E-09	1.7E-04	2.3E-10	3.9E-14	PU-239/240	2.00E-09	2.6E-04	2.3E-10	5.9E-14	9.8E-14
RA-226	4.14E-08	3.5E-03	7.8E-10	2.7E-12	RA-226	4.14E-08	5.3E-03	7.8E-10	4.1E-12	6.9E-12
RA-228	4.08E-08	3.4E-03	1.0E-10	3.4E-13	RA-228	4.04E-08	5.2E-03	1.0E-10	5.2E-13	8.6E-13
SR-90	3.84E-08	3.2E-03	3.6E-11	1.2E-13	SR-90	3.83E-08	4.9E-03	3.6E-11	1.8E-13	2.9E-13
TH-228	3.93E-08	3.3E-03	5.5E-11	1.8E-13	TH-228	3.81E-08	4.9E-03	5.5E-11	2.7E-13	4.5E-13
TH-230	1.61E-07	1.3E-02	1.3E-11	1.8E-13	TH-230	1.61E-07	2.1E-02	1.3E-11	2.7E-13	4.4E-13
TH-232	3.74E-08	3.1E-03	1.7E-10	5.3E-13	TH-232	3.74E-08	4.8E-03	1.7E-10	8.2E-13	1.4E-12
U-234	1.12E-06	9.4E-02	1.6E-11	1.5E-12	U-234	1.12E-06	1.4E-01	1.6E-11	2.3E-12	3.8E-12
U-235/236	7.52E-08	6.3E-03	1.6E-11	1.0E-13	U-235/236	7.52E-08	9.7E-03	1.6E-11	1.5E-13	2.6E-13
U-238	2.05E-06	1.7E-01	2.8E-11	4.8E-12	U-238	2.05E-06	2.6E-01	2.8E-11	7.4E-12	1.2E-11
			Total Pathway:	1.1E-11				Total Pathway:	1.8E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	2.23E-07	4.9E-11	1.8E+00	8.6E-11	Arsenic	2.23E-07	7.5E-11	1.8E+00	1.3E-10	2.2E-10
Benzo(a)anthracene	9.54E-09	2.1E-12	7.3E-01	1.5E-12	Benzo(a)anthracene	9.48E-09	3.2E-12	7.3E-01	2.3E-12	3.8E-12
Benzo(a)pyrene	8.58E-09	1.9E-12	7.3E+00	1.4E-11	Benzo(a)pyrene	8.52E-09	2.9E-12	7.3E+00	2.1E-11	3.5E-11
Benzo(b)fluoranthene	1.78E-08	3.9E-12	7.3E-01	2.8E-12	Benzo(b)fluoranthene	1.76E-08	5.9E-12	7.3E-01	4.3E-12	7.2E-12
Benzo(g,h,i)perylene	1.22E-08	2.7E-12			Benzo(g,h,i)perylene	1.21E-08	4.1E-12			
Beryllium	2.27E-08	5.0E-12	4.3E+00	2.1E-11	Beryllium	2.27E-08	7.6E-12	4.3E+00	3.3E-11	5.4E-11
Lead	1.62E-06	3.6E-10			Lead	1.62E-06	5.4E-10			
Dibenzo(a,h)anthracene	4.94E-09	1.1E-12	7.3E+00	7.9E-12	Dibenzo(a,h)anthracene	4.91E-09	1.6E-12	7.3E+00	1.2E-11	2.0E-11
Indeno(1,2,3-cd)pyrene	1.19E-08	2.6E-12	7.3E-01	1.9E-12	Indeno(1,2,3-cd)pyrene	1.18E-08	3.9E-12	7.3E-01	2.9E-12	4.8E-12
TH-TOTAL	3.42E-07	7.5E-11			TH-TOTAL	3.42E-07	1.1E-10			
Phenanthrene	1.37E-08	3.0E-12			Phenanthrene	1.34E-08	4.5E-12			
			Total Pathway:	1.3E-10				Total Pathway:	2.1E-10	

Total Rad + Chem 1.5E-10 | Total Rad + Chem 2.2E-10 | *Total:* 3.7E-10

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TABLE B.3.4-14(d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.4E-08	2.8E-03		
PU-238	1.9E-08	1.6E-03		
PU-239/240	2.0E-09	1.7E-04		
RA-226	4.1E-08	3.5E-03		
RA-228	4.1E-08	3.4E-03		
SR-90	3.8E-08	3.2E-03		
TH-228	3.9E-08	3.3E-03		
TH-230	1.6E-07	1.3E-02		
TH-232	3.7E-08	3.1E-03		
U-234	1.1E-06	9.4E-02		
U-235/236	7.5E-08	6.3E-03		
U-238	2.0E-06	1.7E-01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.39E-08	4.4E-03		
PU-238	1.87E-08	2.4E-03		
PU-239/240	2.00E-09	2.6E-04		
RA-226	4.14E-08	5.3E-03		
RA-228	4.04E-08	5.2E-03		
SR-90	3.83E-08	4.9E-03		
TH-228	3.81E-08	4.9E-03		
TH-230	1.61E-07	2.1E-02		
TH-232	3.74E-08	4.8E-03		
U-234	1.12E-06	1.4E-01		
U-235/236	7.52E-08	9.7E-03		
U-238	2.05E-06	2.6E-01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.2E-07	5.7E-10	3.0E-04	1.9E-06
Benzo(a)anthracene	9.5E-09	2.4E-11		
Benzo(a)pyrene	8.6E-09	2.2E-11		
Benzo(b)fluoranthene	1.8E-08	4.5E-11		
Benzo(g,h,i)perylene	1.2E-08	3.1E-11		
Beryllium	2.3E-08	5.8E-11	5.0E-03	1.2E-08
Lead	1.6E-06	4.1E-09		
Dibenzo(a,h)anthracene	4.9E-09	1.3E-11		
Indeno(1,2,3-cd)pyrene	1.2E-08	3.0E-11		
TH-TOTAL	3.4E-07	8.8E-10		
Phenanthrene	1.4E-08	3.5E-11		

Total Pathway: 1.9E-06

Total Rad + Chem 1.9E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.23E-07	8.7E-10	3.0E-04	2.9E-06
Benzo(a)anthracene	9.48E-09	3.7E-11		
Benzo(a)pyrene	8.52E-09	3.3E-11		
Benzo(b)fluoranthene	1.76E-08	6.9E-11		
Benzo(g,h,i)perylene	1.21E-08	4.7E-11		
Beryllium	2.27E-08	8.9E-11	5.0E-03	4.4E-13
Lead	1.62E-06	6.3E-09		
Dibenzo(a,h)anthracene	4.91E-09	1.9E-11		
Indeno(1,2,3-cd)pyrene	1.18E-08	4.6E-11		
TH-TOTAL	3.42E-07	1.3E-09		
Phenanthrene	1.34E-08	5.2E-11		

Total Pathway: 2.9E-06

Total Rad + Chem 2.9E-06

Total	
	4.8E-06
	1.2E-08

Total: 4.8E-06

TABLE B.3.4-14(d)

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			1.6E-12
PU-238			2.2E-10		PU-238			2.2E-10			8.7E-13
PU-239/240			2.3E-10		PU-239/240			2.3E-10			9.8E-14
RA-226			7.8E-10		RA-226			7.8E-10			6.9E-12
RA-228			1.0E-10		RA-228			1.0E-10			8.6E-13
SR-90			3.6E-11		SR-90			3.6E-11			2.9E-13
TH-228			5.5E-11		TH-228			5.5E-11			4.5E-13
TH-230			1.3E-11		TH-230			1.3E-11			4.4E-13
TH-232			1.7E-10		TH-232			1.7E-10			1.4E-12
U-234			1.6E-11		U-234			1.6E-11			3.8E-12
U-235/236			1.6E-11		U-235/236			1.6E-11			2.6E-13
U-238			2.8E-11		U-238			2.8E-11			1.2E-11
TC-99	2.94E-04	2.5E+01	1.3E-12	3.2E-11	TC-99	2.94E-04	3.8E+01	1.3E-12	4.9E-11	8.1E-11	8.1E-11
			Total Pathway:	3.2E-11				Total Pathway:	4.9E-11		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			2.2E-10
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			3.8E-12
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			3.5E-11
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			7.2E-12
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			4.3E+00		Beryllium			4.3E+00			5.4E-11
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			2.0E-11
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			4.8E-12
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	3.2E-11				Total Rad + Chem	4.9E-11	*Total:* 8.1E-11	4.5E-10

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TABLE B.3.4-14(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.9E-04	2.5E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.94E-04	3.8E+01		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total	Total Dust & Groundwater Affected
	4.8E-06
	- 1.2E-08

Total Rad + Chem

Total Rad + Chem

Total:	4.8E-06

TABLE B.3.4-15(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
SOLID WASTE LANDFILL: GROUNDWATER
Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	5.4E-02	2.6E+03	1.3E-12	3.4E-09	Not applicable		3.4E-09
			Total Pathway:	3.4E-09	Total Pathway:	Total Pathway:	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk
None identified					None identified				None identified			
			Total Pathway:				Total Pathway:				Total Pathway:	
			Total Rad + Chem	3.4E-09			Total Rad + Chem				Total Rad + Chem	*Total:* 3.4E-09

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TABLE B.3.4-15(a)

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard			
NP-237	5.40E-02	2.6E+03			Not applicable	Not applicable	
Total Pathway:					Total Pathway:	Total Pathway:	

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard
None identified					None identified				None identified			
Total Pathway:					Total Pathway:				Total Pathway:			
Total Rad + Chem					Total Rad + Chem				Total Rad + Chem			*Total:*

TABLE B.3.4-15(b)

FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)

SOLID WASTE LANDFILL: GROUNDWATER

Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	5.4E-02	1.1E+02	1.3E-12	1.5E-10	Not applicable		1.5E-10
			Total Pathway:	1.5E-10	Total Pathway:	Total Pathway:	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk
None identified					None identified				None identified			
			Total Pathway:				Total Pathway:				Total Pathway:	
			Total Rad + Chem	1.5E-10			Total Rad + Chem				Total Rad + Chem	*Total:* 1.5E-10

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TABLE B.3.4-15(b)

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard			
NP-237	5.40E-02	1.1E+02					
					Not applicable	Not applicable	
				Total Pathway:	Total Pathway:	Total Pathway:	

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard
None identified					None identified				None identified			
				Total Pathway:				Total Pathway:				Total Pathway:
				Total Rad + Chem				Total Rad + Chem				Total Rad + Chem

Total:

TABLE B.3.4-15(c)

FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

SOLID WASTE LANDFILL: GROUNDWATER

Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	5.4E-02	2.6E+03	1.3E-12	3.4E-09	Not applicable		3.4E-09
		Total Pathway:		3.4E-09	Total Pathway:	Total Pathway:	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk
None identified					None identified				None identified			
		Total Pathway:				Total Pathway:				Total Pathway:		
		Total Rad + Chem		3.4E-09		Total Rad + Chem				Total Rad + Chem		*Total:* 3.4E-09

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TABLE B.3.4-15(c)

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard			
NP-237	5.40E-02	2.6E+03			Not applicable	Not applicable	
			Total Pathway:		Total Pathway:	Total Pathway:	

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard
None identified					None identified				None identified			
			Total Pathway:				Total Pathway:				Total Pathway:	
			Total Rad + Chem				Total Rad + Chem				Total Rad + Chem	*Total:*

TABLE B.3.4-15(d)

FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)

SOLID WASTE LANDFILL: GROUNDWATER

Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	5.4E-02	1.1E+02	1.3E-12	1.5E-10	Not applicable		1.5E-10
			Total Pathway:	1.5E-10	Total Pathway:	Total Pathway:	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk
None identified					None identified				None identified			
			Total Pathway:				Total Pathway:				Total Pathway:	
			Total Rad + Chem	1.5E-10			Total Rad + Chem				Total Rad + Chem	*Total:* 1.5E-10

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TABLE B.3.4-15(d)

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard			
NP-237	5.40E-02	1.1E+02			Not applicable	Not applicable	
Total Pathway:					Total Pathway:	Total Pathway:	

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard	
None identified					None identified				None identified				
Total Pathway:					Total Pathway:				Total Pathway:				
Total Rad + Chem					Total Rad + Chem				Total Rad + Chem				*Total:*

Table B.3.4-16
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TABLE B.3.4-17
FUTURE, EXPANDED TRESPASSER
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	3.57E-06	1.2E-02	2.9E-08	3.4E-10
PU-238	2.32E-06	7.5E-03	3.9E-08	2.9E-10
PU-239/240	2.46E-07	8.0E-04	3.8E-08	3.0E-11
RA-226	4.27E-06	1.4E-02	7.0E-09	9.7E-11
RA-228	5.04E-06	1.6E-02	6.9E-10	1.1E-11
SR-90	2.87E-06	9.3E-03	6.2E-11	5.8E-13
TH-228	4.88E-06	1.6E-02	7.8E-08	1.2E-09
TH-230	1.94E-05	6.3E-02	2.9E-08	1.8E-09
TH-232	4.53E-06	1.5E-02	1.1E-07	1.6E-09
U-234	1.26E-04	4.1E-01	2.6E-08	1.1E-08
U-235/236	8.51E-06	2.8E-02	2.5E-08	6.9E-10
U-238	2.31E-04	7.5E-01	5.2E-08	3.9E-08

Total Pathway: 5.6E-08

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	3.9E+01	2.2E-10	8.5E-09
PU-238	7.72E-01	2.5E+01	2.2E-10	5.5E-09
PU-239/240	8.20E-02	2.7E+00	2.3E-10	6.1E-10
RA-226	1.40E+00	4.6E+01	7.8E-10	3.5E-08
RA-228	1.68E+00	5.5E+01	1.0E-10	5.5E-09
SR-90	9.55E-01	3.1E+01	3.6E-11	1.1E-09
TH-228	1.63E+00	5.3E+01	5.5E-11	2.9E-09
TH-230	6.48E+00	2.1E+02	1.3E-11	2.7E-09
TH-232	1.51E+00	4.9E+01	1.7E-10	8.3E-09
U-234	4.21E+01	1.4E+03	1.6E-11	2.2E-08
U-235/236	2.84E+00	9.2E+01	1.6E-11	1.5E-09
U-238	7.72E+01	2.5E+03	2.8E-11	7.0E-08

Total Pathway: 1.6E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	2.00E-08	5.2E-11	1.5E+01	7.8E-10
Benzo(a)anthracene	1.12E-09	2.9E-12	6.1E-01	1.8E-12
Benzo(a)pyrene	1.02E-09	2.6E-12	6.1E+00	1.6E-11
Benzo(b)fluoranthene	2.13E-09	5.5E-12	6.1E-01	3.4E-12
Benzo(g,h,i)perylene	1.53E-09	4.0E-12		
Beryllium	2.09E-09	5.4E-12	8.4E+00	4.5E-11
Lead	5.70E-08	1.5E-10		
Dibenzo(a,h)anthracene	6.00E-10	1.6E-12	6.1E+00	9.5E-12
Indeno(1,2,3-cd)pyrene	1.44E-09	3.7E-12	6.1E-01	2.3E-12
TH-TOTAL	4.21E-08	1.1E-10		
Phenanthrene	1.62E-09	4.2E-12		

Total Pathway: 8.5E-10

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.67E+00	1.6E-07	1.8E+00	2.8E-07
Benzo(a)anthracene	3.66E-01	8.8E-09	7.3E-01	6.4E-09
Benzo(a)pyrene	3.40E-01	8.1E-09	7.3E+00	5.9E-08
Benzo(b)fluoranthene	7.10E-01	1.7E-08	7.3E-01	1.2E-08
Benzo(g,h,i)perylene	5.00E-01	1.2E-08		
Beryllium	6.98E-01	1.7E-08	4.3E+00	7.2E-08
Lead	1.90E+01	4.6E-07		
Dibenzo(a,h)anthracene	2.00E-01	4.8E-09	7.3E+00	3.5E-08
Indeno(1,2,3-cd)pyrene	4.80E-01	1.2E-08	7.3E-01	8.4E-09
TH-TOTAL	1.38E+01	3.3E-07		
Phenanthrene	5.31E-01	1.3E-08		

Total Pathway: 4.7E-07

Total Rad + Chem 5.7E-08

Total Rad + Chem 6.4E-07

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TABLE B.3.4-17
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil				External Radiation/Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable				NP-237	5.3E-01	4.30E-07	2.3E-07	2.4E-07
				PU-238	3.5E-01	2.80E-11	9.7E-12	5.8E-09
				PU-239/240	3.7E-02	2.70E-11	9.9E-13	6.4E-10
				RA-226	6.3E-01	6.00E-06	3.8E-06	3.8E-06
				RA-228	7.5E-01	2.90E-06	2.2E-06	2.2E-06
				SR-90	4.3E-01			1.1E-09
				TH-228	7.3E-01	5.60E-06	4.1E-06	4.1E-06
				TH-230	2.9E+00	5.40E-11	1.6E-10	4.7E-09
				TH-232	6.8E-01	8.50E-06	5.7E-06	5.8E-06
				U-234	1.9E+01	3.00E-11	5.7E-10	3.3E-08
				U-235/236	1.3E+00	2.40E-07	3.1E-07	3.1E-07
				U-238	3.5E+01	3.60E-08	1.2E-06	1.4E-06
Total Pathway:				Total Pathway:			1.8E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	6.1E-08	1.8E+00	1.1E-07					3.9E-07
Benzo(a)anthracene			6.4E-09					1.3E-08
Benzo(a)pyrene			5.9E-08					1.2E-07
Benzo(b)fluoranthene			1.2E-08					2.5E-08
Benzo(g,h,i)perylene	1.4E-06							
Beryllium	6.4E-08		7.2E-08	Not applicable				1.4E-07
Lead	1.7E-06							
Dibenzo(a,h)anthracene			3.5E-08					7.0E-08
Indeno(1,2,3-cd)pyrene			8.4E-09					1.7E-08
TH-TOTAL	1.3E-06							
Phenanthrene	1.5E-06							
Total Pathway:			3.1E-07	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 3.1E-07 | 1.8E-05 | *Total:* 1.9E-05

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TABLE B.3.4-17
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	3.57E-06	1.2E-02		
PU-238	2.32E-06	7.5E-03		
PU-239/240	2.46E-07	8.0E-04		
RA-226	4.27E-06	1.4E-02		
RA-228	5.04E-06	1.6E-02		
SR-90	2.87E-06	9.3E-03		
TH-228	4.88E-06	1.6E-02		
TH-230	1.94E-05	6.3E-02		
TH-232	4.53E-06	1.5E-02		
U-234	1.26E-04	4.1E-01		
U-235/236	8.51E-06	2.8E-02		
U-238	2.31E-04	7.5E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19	3.9E+01		
PU-238	0.77	2.5E+01		
PU-239/240	0.08	2.7E+00		
RA-226	1.40	4.6E+01		
RA-228	1.68	5.5E+01		
SR-90	0.96	3.1E+01		
TH-228	1.63	5.3E+01		
TH-230	6.48	2.1E+02		
TH-232	1.51	4.9E+01		
U-234	42.10	1.4E+03		
U-235/236	2.84	9.2E+01		
U-238	77.20	2.5E+03		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	2.00E-08	8.2E-11		
Benzo(a)anthracene	1.12E-09	4.6E-12		
Benzo(a)pyrene	1.02E-09	4.2E-12		
Benzo(b)fluoranthene	2.13E-09	8.8E-12		
Benzo(g,h,i)perylene	1.53E-09	6.3E-12		
Beryllium	2.09E-09	8.6E-12		
Lead	5.70E-08	2.3E-10		
Dibenzo(a,h)anthracene	6.00E-10	2.5E-12		
Indeno(1,2,3-cd)pyrene	1.44E-09	5.9E-12		
TH-TOTAL	4.21E-08	1.7E-10		
Phenanthrene	1.62E-09	6.7E-12		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.67	2.5E-07	3.0E-04	8.5E-04
Benzo(a)anthracene	0.37	1.4E-08		
Benzo(a)pyrene	0.34	1.3E-08		
Benzo(b)fluoranthene	0.71	2.7E-08		
Benzo(g,h,i)perylene	0.50	1.9E-08		
Beryllium	0.70	2.7E-08	5.0E-03	5.3E-06
Lead	19.00	7.2E-07		
Dibenzo(a,h)anthracene	0.20	7.6E-09		
Indeno(1,2,3-cd)pyrene	0.48	1.8E-08		
TH-TOTAL	13.80	5.3E-07		
Phenanthrene	0.53	2.0E-08		

Total Pathway: 8.5E-04

Total Rad + Chem

Total Rad + Chem 8.5E-04

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TABLE B.3.4-17
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	5.3E-01		
	PU-238	3.5E-01		
	PU-239/240	3.7E-02		
	RA-226	6.3E-01		
	RA-228	7.5E-01		
	SR-90	4.3E-01		
	TH-228	7.3E-01		
	TH-230	2.9E+00		
	TH-232	6.8E-01		
	U-234	1.9E+01		
	U-235/236	1.3E+00		
	U-238	3.5E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	9.7E-08	2.9E-04	3.4E-04					1.2E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.2E-06							
Beryllium	1.0E-07	5.0E-05	2.0E-03					2.0E-03
Lead	2.8E-06			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	2.0E-06							
Phenanthrene	2.3E-06							
Total Pathway:			2.4E-03	Total Pathway:				

Total Rad + Chem 2.4E-03

Total: 3.2E-03

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TABLE B.3.4-18(a)
FUTURE, EXPANDED TRESPASSER
SOLID WASTE LANDFILL: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	5.25E-01	1.1E+01	2.2E-10	2.5E-09		2.5E-09
RA-226	4.86E-02	1.1E+00	7.8E-10	8.3E-10	Not applicable	8.3E-10
RA-228	5.85E-02	1.3E+00	1.0E-10	1.3E-10		1.3E-10
SR-90	2.30E+00	5.0E+01	3.6E-11	1.8E-09		1.8E-09
U-234	1.36E+01	3.0E+02	1.6E-11	4.8E-09		4.8E-09
U-235/236	9.14E-01	2.0E+01	1.6E-11	3.2E-10		3.2E-10
U-238	2.50E+01	5.5E+02	2.8E-11	1.5E-08		1.5E-08
			Total Pathway:	2.6E-08	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	8.09E-04	1.6E-08	1.8E+00	2.8E-08	Arsenic	2.4E-09	1.8E+00	4.3E-09	3.2E-08
Benzo(a)anthracene	3.38E-06	6.7E-11	7.3E-01	4.9E-11	Benzo(a)anthracene			4.9E-11	9.8E-11
Benzo(a)pyrene	1.31E-06	2.6E-11	7.3E+00	1.9E-10	Benzo(a)pyrene			1.9E-10	3.8E-10
Benzo(g,h,i)perylene	5.7E-07	1.1E-11			Benzo(g,h,i)perylene				
Beryllium	1.3E-05	2.6E-10	4.3E+00	1.1E-09	Beryllium	3.8E-11		1.1E-09	2.2E-09
Dibenzo(a,h)anthracene	7.9E-07	1.6E-11	7.3E+00	1.1E-10	Dibenzo(a,h)anthracene			1.1E-10	2.3E-10
Lead	1.5E-04	3.1E-09			Lead	1.8E-12			
Phenanthrene	5.5E-02	1.1E-06			Phenanthrene				
U-TOTAL	7.3E-02	1.4E-06			U-TOTAL	2.1E-07			
			Total Pathway:	3.0E-08			Total Pathway:	5.8E-09	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	5.5E-08	Total Rad + Chem	5.8E-09	*Total:* 6.1E-08

TABLE B.3.4-18(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	5.25E-01	1.1E+01			Not applicable	
RA-226	4.86E-02	1.1E+00				
RA-228	5.85E-02	1.3E+00				
SR-90	2.30E+00	5.0E+01				
U-234	1.36E+01	3.0E+02				
U-235/236	9.14E-01	2.0E+01				
U-238	2.50E+01	5.5E+02				
		Total Pathway:			Total Pathway:	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				Total
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	8.09E-04	9.4E-08	3.00E-04	3.1E-04	Arsenic	1.38E-08	2.85E-04	4.8E-05	3.6E-04
Benzo(a)anthracene	3.38E-06	3.9E-10			Benzo(a)anthracene	4.65E-08			
Benzo(a)pyrene	1.31E-06	1.5E-10			Benzo(a)pyrene	2.67E-08			
Benzo(g,h,i)perylene	5.69E-07	6.6E-11			Benzo(g,h,i)perylene	5.19E-08			
Beryllium	1.30E-05	1.5E-09	5.00E-03	3.0E-07	Beryllium	2.21E-10	5.00E-05	4.4E-06	4.7E-06
Dibenzo(a,h)anthracene	7.90E-07	9.2E-11			Dibenzo(a,h)anthracene	3.63E-08			
Lead	1.54E-04	1.8E-08			Lead	1.05E-11			
Phenanthrene	5.52E-02	6.4E-06			Phenanthrene	2.16E-04			
U-TOTAL	7.27E-02	8.4E-06	3.00E-03	2.8E-03	U-TOTAL	1.24E-06	1.50E-04	8.2E-03	1.1E-02
		Total Pathway:		3.1E-03		Total Pathway:		8.3E-03	
		Total Rad + Chem		3.1E-03		Total Rad + Chem		8.3E-03	*Total:* 1.1E-02

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TABLE B.3.4-18(b)

FUTURE, EXPANDED TRESPASSER

SOLID WASTE LANDFILL: SEDIMENT

Carcinogenic Risk

Radiation Risk

Ingestion/Sediment

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	4.7E+00	2.2E-10	1.0E-09
RA-226	1.39E+00	5.5E+00	7.8E-10	4.3E-09
RA-228	1.68E+00	6.6E+00	1.0E-10	6.6E-10
SR-90	9.47E-01	3.7E+00	3.6E-11	1.3E-10
U-234	4.20E+01	1.7E+02	1.6E-11	2.6E-09
U-235/236	2.83E+00	1.1E+01	1.6E-11	1.8E-10
U-238	7.73E+01	3.0E+02	2.8E-11	8.5E-09

Total Pathway: 1.7E-08

Dermal Contact/Sediment

Not applicable

Total Pathway:

External Radiation/Sediment

Compound	Intake	SF(e)	Risk
NP-237	8.5E-02	4.3E-07	3.6E-08
RA-226	9.9E-02	6.0E-06	5.9E-07
RA-228	1.2E-01	2.9E-06	3.5E-07
SR-90	6.7E-02		
U-234	3.0E+00	3.0E-11	9.0E-11
U-235/236	2.0E-01	2.4E-07	4.8E-08
U-238	5.5E+00	3.6E-08	2.0E-07

Total Pathway: 1.2E-06

Total
3.8E-08
6.0E-07
3.5E-07
1.3E-10
2.7E-09
4.9E-08
2.1E-07

Chemical Risk

Ingestion/Sediment

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.7E+00	2.4E-08	1.8E+00	4.2E-08
Benzo(a)anthracene	3.7E-01	1.3E-09	7.3E-01	9.6E-10
Benzo(a)pyrene	3.4E-01	1.2E-09	7.3E+00	8.9E-09
Benzo(g,h,i)perylene	5.0E-01	1.8E-09		
Beryllium	7.0E-01	2.5E-09	4.3E+00	1.1E-08
Dibenz(a,h)anthracene	2.0E-01	7.2E-10	7.3E+00	5.2E-09
Lead	1.9E+01	6.8E-08		
Phenanthrene	5.3E-01	1.9E-09		
U-TOTAL	2.3E+02	8.1E-07		

Total Pathway: 6.8E-08

Dermal Contact/Sediment

Compound	Intake	SF(derm)	Risk
Arsenic	1.9E-08	1.8E+00	3.6E-08
Benzo(a)anthracene			9.6E-10
Benzo(a)pyrene			8.9E-09
Benzo(g,h,i)perylene	4.4E-07		
Beryllium	2.0E-08		1.1E-08
Dibenz(a,h)anthracene			5.2E-09
Lead	5.5E-07		
Phenanthrene	4.6E-07		
U-TOTAL	6.6E-06		

Total Pathway: 6.2E-08

External Radiation/Sediment

Compound	Intake	SF(e)	Risk

Not applicable

Total Pathway:

Total
7.8E-08
1.9E-09
1.8E-08
2.1E-08
1.0E-08

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 8.5E-08

Total Rad + Chem 6.2E-08

Total Rad + Chem 1.2E-06

Total: 1.4E-06

TABLE B.3.4-18 (continued)
FUTURE, EXPANDED TRESPASSER
SOLID WASTE LANDFILL: SEDIMENT
Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment					Dermal Contact/Sediment	Total
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard		
NP-237	1.19E+00	4.7E+00			Not applicable	
RA-226	1.39E+00	5.5E+00				
RA-228	1.68E+00	6.6E+00				
SR-90	9.47E-01	3.7E+00				
U-234	4.20E+01	1.7E+02				
U-235/236	2.83E+00	1.1E+01				
U-238	7.73E+01	3.0E+02				
Total Pathway:					Total Pathway:	

Chemical Hazard

Ingestion/Sediment					Dermal Contact/Sediment				
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	6.67E+00	1.4E-07	3.0E-04	4.6E-04	Arsenic	1.1E-07	2.9E-04	4.0E-04	8.6E-04
Benzo(a)anthracene	3.66E-01	7.6E-09			Benzo(a)anthracene				
Benzo(a)pyrene	3.40E-01	7.1E-09			Benzo(a)pyrene				
Benzo(g,h,i)perylene	5.00E-01	1.0E-08			Benzo(g,h,i)perylene	2.5E-06			
Beryllium	6.98E-01	1.5E-08	5.0E-03	2.9E-06	Beryllium	1.2E-07	5.0E-05	2.4E-03	2.4E-03
Dibenz(a,h)anthracene	2.00E-01	4.2E-09			Dibenz(a,h)anthracene				
Lead	1.90E+01	4.0E-07			Lead	3.2E-06			
Phenanthrene	5.30E-01	1.1E-08			Phenanthrene	2.7E-06			
U-TOTAL	2.25E+02	4.7E-06	3.0E-03	1.6E-03	U-TOTAL	3.8E-05	1.5E-04	2.5E-01	2.6E-01
			Total Pathway:	2.0E-03			Total Pathway:	2.6E-01	
			Total Rad + Chem	2.0E-03			Total Rad + Chem	2.6E-01	*Total:* 2.6E-01

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TABLE B.3.4-19(a)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	1.08E-04	1.3E+01	2.9E-08	3.6E-07
PU-238	7.03E-05	8.1E+00	3.9E-08	3.2E-07
PU-239/240	7.46E-06	8.6E-01	3.8E-08	3.3E-08
RA-226	1.78E-04	2.1E+01	7.0E-09	1.4E-07
RA-228	1.53E-04	1.8E+01	6.9E-10	1.2E-08
SR-90	8.69E-05	1.0E+01	6.2E-11	6.2E-10
TH-228	1.48E-04	1.7E+01	7.8E-08	1.3E-06
TH-230	5.89E-04	6.8E+01	2.9E-08	2.0E-06
TH-232	1.38E-04	1.6E+01	1.1E-07	1.8E-06
U-234	3.83E-03	4.4E+02	2.6E-08	1.2E-05
U-235/236	2.58E-04	3.0E+01	2.5E-08	7.5E-07
U-238	7.02E-03	8.1E+02	5.2E-08	4.2E-05

Total Pathway: 6.1E-05

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	5.2E+03	2.2E-10	1.2E-06
PU-238	7.72E-01	3.4E+03	2.2E-10	7.5E-07
PU-239/240	8.20E-02	3.6E+02	2.3E-10	8.3E-08
RA-226	1.40E+00	6.2E+03	7.8E-10	4.8E-06
RA-228	1.68E+00	7.4E+03	1.0E-10	7.4E-07
SR-90	9.55E-01	4.2E+03	3.6E-11	1.5E-07
TH-228	1.63E+00	7.2E+03	5.5E-11	4.0E-07
TH-230	6.48E+00	2.9E+04	1.3E-11	3.7E-07
TH-232	1.51E+00	6.7E+03	1.7E-10	1.1E-06
U-234	4.21E+01	1.9E+05	1.6E-11	3.0E-06
U-235/236	2.84E+00	1.3E+04	1.6E-11	2.0E-07
U-238	7.72E+01	3.4E+05	2.8E-11	9.5E-06

Total Pathway: 2.2E-05

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	6.07E-07	3.9E-08	1.5E+01	5.9E-07
Benzo(a)anthracene	3.35E-08	2.2E-09	6.1E-01	1.3E-09
Benzo(a)pyrene	3.09E-08	2.0E-09	6.1E+00	1.2E-08
Benzo(b)fluoranthene	6.46E-08	4.2E-09	6.1E-01	2.6E-09
Benzo(g,h,i)perylene	4.58E-08	3.0E-09		
Beryllium	6.35E-08	4.1E-09	8.4E+00	3.5E-08
Lead	1.73E-06	1.1E-07		
Dibenzo(a,h)anthracene	1.82E-08	1.2E-09	6.1E+00	7.2E-09
Indeno(1,2,3-cd)pyrene	4.37E-08	2.8E-09	6.1E-01	1.7E-09
TH-TOTAL	1.25E-06	8.1E-08		
Phenanthrene	4.86E-08	3.1E-09		

Total Pathway: 6.5E-07

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.67E+00	1.6E-05	1.8E+00	2.9E-05
Benzo(a)anthracene	3.66E-01	9.0E-07	7.3E-01	6.6E-07
Benzo(a)pyrene	3.40E-01	8.4E-07	7.3E+00	6.1E-06
Benzo(b)fluoranthene	7.10E-01	1.8E-06	7.3E-01	1.3E-06
Benzo(g,h,i)perylene	5.00E-01	1.2E-06		
Beryllium	6.98E-01	1.7E-06	4.3E+00	7.4E-06
Lead	1.90E+01	4.7E-05		
Dibenzo(a,h)anthracene	2.00E-01	4.9E-07	7.3E+00	3.6E-06
Indeno(1,2,3-cd)pyrene	4.80E-01	1.2E-06	7.3E-01	8.6E-07
TH-TOTAL	1.38E+01	3.4E-05		
Phenanthrene	5.31E-01	1.3E-06		

Total Pathway: 4.9E-05

Total Rad + Chem 6.1E-05

Total Rad + Chem 7.1E-05

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TABLE B.3.4-19(a)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	4.9E+01	4.30E-07	2.1E-05	2.3E-05
	PU-238	3.2E+01	2.80E-11	9.0E-10	1.1E-06
	PU-239/240	3.4E+00	2.70E-11	9.2E-11	1.2E-07
	RA-226	5.8E+01	6.00E-06	3.5E-04	3.5E-04
	RA-228	7.0E+01	2.90E-06	2.0E-04	2.0E-04
	SR-90	4.0E+01			1.5E-07
	TH-228	6.8E+01	5.60E-06	3.8E-04	3.8E-04
	TH-230	2.7E+02	5.40E-11	1.5E-08	2.4E-06
	TH-232	6.3E+01	8.50E-06	5.3E-04	5.4E-04
	U-234	1.7E+03	3.00E-11	5.2E-08	1.5E-05
	U-235/236	1.2E+02	2.40E-07	2.8E-05	2.9E-05
	U-238	3.2E+03	3.60E-08	1.2E-04	1.7E-04
Total Pathway:			Total Pathway:	1.6E-03	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	5.3E-07	1.8E+00	9.7E-07					3.0E-05
Benzo(a)anthracene			6.6E-07					1.3E-06
Benzo(a)pyrene			6.1E-06					1.2E-05
Benzo(b)fluoranthene			1.3E-06					2.6E-06
Benzo(g,h,i)perylene	1.2E-05							
Beryllium	5.5E-07		7.4E-06	Not applicable				1.5E-05
Lead	1.5E-05							
Dibenzo(a,h)anthracene			3.6E-06					7.2E-06
Indeno(1,2,3-cd)pyrene			8.6E-07					1.7E-06
TH-TOTAL	1.1E-05							
Phenanthrene	1.3E-05							
Total Pathway:			2.1E-05	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.1E-05 1.6E-03 *Total:* 1.8E-03

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TABLE B.3.4-19(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	1.08E-04	1.3E+01		
PU-238	7.03E-05	8.1E+00		
PU-239/240	7.46E-06	8.6E-01		
RA-226	1.78E-04	2.1E+01		
RA-228	1.53E-04	1.8E+01		
SR-90	8.69E-05	1.0E+01		
TH-228	1.48E-04	1.7E+01		
TH-230	5.89E-04	6.8E+01		
TH-232	1.38E-04	1.6E+01		
U-234	3.83E-03	4.4E+02		
U-235/236	2.58E-04	3.0E+01		
U-238	7.02E-03	8.1E+02		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19	5.2E+03		
PU-238	0.77	3.4E+03		
PU-239/240	0.08	3.6E+02		
RA-226	1.40	6.2E+03		
RA-228	1.68	7.4E+03		
SR-90	0.96	4.2E+03		
TH-228	1.63	7.2E+03		
TH-230	6.48	2.9E+04		
TH-232	1.51	6.7E+03		
U-234	42.10	1.9E+05		
U-235/236	2.84	1.3E+04		
U-238	77.20	3.4E+05		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.07E-07	3.9E-08		
Benzo(a)anthracene	3.35E-08	2.2E-09		
Benzo(a)pyrene	3.09E-08	2.0E-09		
Benzo(b)fluoranthene	6.46E-08	4.2E-09		
Benzo(g,h,i)perylene	4.58E-08	3.0E-09		
Beryllium	6.35E-08	4.1E-09		
Lead	1.73E-06	1.1E-07		
Dibenzo(a,h)anthracene	1.82E-08	1.2E-09		
Indeno(1,2,3-cd)pyrene	4.37E-08	2.8E-09		
TH-TOTAL	1.25E-06	8.1E-08		
Phenanthrene	4.86E-08	3.1E-09		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.67	1.6E-05	3.0E-04	5.5E-02
Benzo(a)anthracene	0.37	9.0E-07		
Benzo(a)pyrene	0.34	8.4E-07		
Benzo(b)fluoranthene	0.71	1.8E-06		
Benzo(g,h,i)perylene	0.50	1.2E-06		
Beryllium	0.70	1.7E-06	5.0E-03	3.4E-04
Lead	19.00	4.7E-05		
Dibenzo(a,h)anthracene	0.20	4.9E-07		
Indeno(1,2,3-cd)pyrene	0.48	1.2E-06		
TH-TOTAL	13.80	3.4E-05		
Phenanthrene	0.53	1.3E-06		

Total Pathway: 5.5E-02

Total Rad + Chem

Total Rad + Chem 5.5E-02

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TABLE B.3.4-19(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	4.9E+01		
	PU-238	3.2E+01		
	PU-239/240	3.4E+00		
	RA-226	5.8E+01		
	RA-228	7.0E+01		
	SR-90	4.0E+01		
	TH-228	6.8E+01		
	TH-230	2.7E+02		
	TH-232	6.3E+01		
	U-234	1.7E+03		
	U-235/236	1.2E+02		
	U-238	3.2E+03		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil			
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard
Arsenic	5.3E-07	2.9E-04	1.8E-03				
Benzo(a)anthracene							
Benzo(a)pyrene							
Benzo(b)fluoranthene							
Benzo(g,h,i)perylene	1.2E-05						
Beryllium	5.5E-07	5.0E-05	1.1E-02				
Lead	1.5E-05			Not applicable			
Dibenzo(a,h)anthracene							
Indeno(1,2,3-cd)pyrene							
TH-TOTAL	1.1E-05						
Phenanthrene	1.3E-05						
Total Pathway:			1.3E-02	Total Pathway:			

Total
5.7E-02
1.1E-02

Total Rad + Chem 1.3E-02

Total: 6.8E-02

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TABLE B.3.4-19(b)
FUTURE, ON-PROPERTY CHILD
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	1.08E-04	2.3E-01	2.9E-08	6.6E-09
PU-238	7.03E-05	1.5E-01	3.9E-08	5.8E-09
PU-239/240	7.46E-06	1.6E-02	3.8E-08	6.0E-10
RA-226	1.78E-04	3.7E-01	7.0E-09	2.6E-09
RA-228	1.53E-04	3.2E-01	6.9E-10	2.2E-10
SR-90	8.69E-05	1.8E-01	6.2E-11	1.1E-11
TH-228	1.48E-04	3.1E-01	7.8E-08	2.4E-08
TH-230	5.89E-04	1.2E+00	2.9E-08	3.6E-08
TH-232	1.38E-04	2.9E-01	1.1E-07	3.2E-08
U-234	3.83E-03	8.0E+00	2.6E-08	2.1E-07
U-235/236	2.58E-04	5.4E-01	2.5E-08	1.4E-08
U-238	7.02E-03	1.5E+01	5.2E-08	7.7E-07

Total Pathway: 1.1E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	5.0E+02	2.2E-10	1.1E-07
PU-238	7.72E-01	3.2E+02	2.2E-10	7.1E-08
PU-239/240	8.20E-02	3.4E+01	2.3E-10	7.9E-09
RA-226	1.40E+00	5.9E+02	7.8E-10	4.6E-07
RA-228	1.68E+00	7.1E+02	1.0E-10	7.1E-08
SR-90	9.55E-01	4.0E+02	3.6E-11	1.4E-08
TH-228	1.63E+00	6.8E+02	5.5E-11	3.8E-08
TH-230	6.48E+00	2.7E+03	1.3E-11	3.5E-08
TH-232	1.51E+00	6.3E+02	1.7E-10	1.1E-07
U-234	4.21E+01	1.8E+04	1.6E-11	2.8E-07
U-235/236	2.84E+00	1.2E+03	1.6E-11	1.9E-08
U-238	7.72E+01	3.2E+04	2.8E-11	9.1E-07

Total Pathway: 2.1E-06

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	6.07E-07	3.3E-09	1.5E+01	5.0E-08
Benzo(a)anthracene	3.35E-08	1.8E-10	6.1E-01	1.1E-10
Benzo(a)pyrene	3.09E-08	1.7E-10	6.1E+00	1.0E-09
Benzo(b)fluoranthene	6.46E-08	3.5E-10	6.1E-01	2.2E-10
Benzo(g,h,i)perylene	4.58E-08	2.5E-10		
Beryllium	6.35E-08	3.5E-10	8.4E+00	2.9E-09
Lead	1.73E-06	9.5E-09		
Dibenzo(a,h)anthracene	1.82E-08	1.0E-10	6.1E+00	6.1E-10
Indeno(1,2,3-cd)pyrene	4.37E-08	2.4E-10	6.1E-01	1.5E-10
TH-TOTAL	1.25E-06	6.8E-09		
Phenanthrene	4.86E-08	2.7E-10		

Total Pathway: 5.5E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.67E+00	7.3E-06	1.8E+00	1.3E-05
Benzo(a)anthracene	3.66E-01	4.0E-07	7.3E-01	2.9E-07
Benzo(a)pyrene	3.40E-01	3.7E-07	7.3E+00	2.7E-06
Benzo(b)fluoranthene	7.10E-01	7.8E-07	7.3E-01	5.7E-07
Benzo(g,h,i)perylene	5.00E-01	5.5E-07		
Beryllium	6.98E-01	7.6E-07	4.3E+00	3.3E-06
Lead	1.90E+01	2.1E-05		
Dibenzo(a,h)anthracene	2.00E-01	2.2E-07	7.3E+00	1.6E-06
Indeno(1,2,3-cd)pyrene	4.80E-01	5.3E-07	7.3E-01	3.8E-07
TH-TOTAL	1.38E+01	1.5E-05		
Phenanthrene	5.31E-01	5.8E-07		

Total Pathway: 2.2E-05

Total Rad + Chem 1.2E-06

Total Rad + Chem 2.4E-05

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TABLE B.3.4-19(b)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	3.7E+00	4.30E-07	1.6E-06	1.7E-06
	PU-238	2.4E+00	2.80E-11	6.7E-11	7.7E-08
	PU-239/240	2.6E-01	2.70E-11	6.9E-12	8.5E-09
	RA-226	4.4E+00	6.00E-06	2.6E-05	2.7E-05
	RA-228	5.2E+00	2.90E-06	1.5E-05	1.5E-05
	SR-90	3.0E+00			1.4E-08
	TH-228	5.1E+00	5.60E-06	2.8E-05	2.9E-05
	TH-230	2.0E+01	5.40E-11	1.1E-09	7.2E-08
	TH-232	4.7E+00	8.50E-06	4.0E-05	4.0E-05
	U-234	1.3E+02	3.00E-11	3.9E-09	5.0E-07
	U-235/236	8.9E+00	2.40E-07	2.1E-06	2.2E-06
	U-238	2.4E+02	3.60E-08	8.7E-06	1.0E-05
Total Pathway:			Total Pathway:	1.2E-04	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	7.3E-08	1.8E+00	1.3E-07					1.3E-05
Benzo(a)anthracene			2.9E-07					5.9E-07
Benzo(a)pyrene			2.7E-06					5.4E-06
Benzo(b)fluoranthene			5.7E-07					1.1E-06
Benzo(g,h,i)perylene	1.6E-06							
Beryllium	7.6E-08		3.3E-06		Not applicable			6.6E-06
Lead	2.1E-06							
Dibenzo(a,h)anthracene			1.6E-06					3.2E-06
Indeno(1,2,3-cd)pyrene			3.8E-07					7.7E-07
TH-TOTAL	1.5E-06							
Phenanthrene	1.7E-06							
Total Pathway:			9.0E-06	Total Pathway:				

Total Rad + Chem 9.0E-06 1.2E-04 *Total:* 1.6E-04

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TABLE B.3.4-19(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	1.08E-04	2.3E-01		
PU-238	7.03E-05	1.5E-01		
PU-239/240	7.46E-06	1.6E-02		
RA-226	1.78E-04	3.7E-01		
RA-228	1.53E-04	3.2E-01		
SR-90	8.69E-05	1.8E-01		
TH-228	1.48E-04	3.1E-01		
TH-230	5.89E-04	1.2E+00		
TH-232	1.38E-04	2.9E-01		
U-234	3.83E-03	8.0E+00		
U-235/236	2.58E-04	5.4E-01		
U-238	7.02E-03	1.5E+01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19	5.0E+02		
PU-238	0.77	3.2E+02		
PU-239/240	0.08	3.4E+01		
RA-226	1.40	5.9E+02		
RA-228	1.68	7.1E+02		
SR-90	0.96	4.0E+02		
TH-228	1.63	6.8E+02		
TH-230	6.48	2.7E+03		
TH-232	1.51	6.3E+02		
U-234	42.10	1.8E+04		
U-235/236	2.84	1.2E+03		
U-238	77.20	3.2E+04		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.07E-07	3.9E-08		
Benzo(a)anthracene	3.35E-08	2.1E-09		
Benzo(a)pyrene	3.09E-08	2.0E-09		
Benzo(b)fluoranthene	6.46E-08	4.1E-09		
Benzo(g,h,i)perylene	4.58E-08	2.9E-09		
Beryllium	6.35E-08	4.1E-09		
Lead	1.73E-06	1.1E-07		
Dibenzo(a,h)anthracene	1.82E-08	1.2E-09		
Indeno(1,2,3-cd)pyrene	4.37E-08	2.8E-09		
TH-TOTAL	1.25E-06	8.0E-08		
Phenanthrene	4.86E-08	3.1E-09		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.67	8.5E-05	3.0E-04	2.8E-01
Benzo(a)anthracene	0.37	4.7E-06		
Benzo(a)pyrene	0.34	4.3E-06		
Benzo(b)fluoranthene	0.71	9.1E-06		
Benzo(g,h,i)perylene	0.50	6.4E-06		
Beryllium	0.70	8.9E-06	5.0E-03	1.8E-03
Lead	19.00	2.4E-04		
Dibenzo(a,h)anthracene	0.20	2.6E-06		
Indeno(1,2,3-cd)pyrene	0.48	6.1E-06		
TH-TOTAL	13.80	1.8E-04		
Phenanthrene	0.53	6.8E-06		

Total Pathway: 2.9E-01

Total Rad + Chem

Total Rad + Chem 2.9E-01

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TABLE B.3.4-19(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	3.7E+00		
	PU-238	2.4E+00		
	PU-239/240	2.6E-01		
	RA-226	4.4E+00		
	RA-228	5.2E+00		
	SR-90	3.0E+00		
	TH-228	5.1E+00		
	TH-230	2.0E+01		
	TH-232	4.7E+00		
	U-234	1.3E+02		
	U-235/236	8.9E+00		
	U-238	2.4E+02		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	8.5E-07	2.9E-04	3.0E-03					2.9E-01
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.9E-05							
Beryllium	8.9E-07	5.0E-05	1.8E-02					2.0E-02
Lead	2.4E-05			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	1.8E-05							
Phenanthrene	2.0E-05							
Total Pathway:	2.1E-02			Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.1E-02

Total: 3.1E-01

TABLE B.3.4-20(a)

FUTURE, ON-PROPERTY FARMER (RME VALUES)

SOLID WASTE LANDFILL: GROUNDWATER

Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
TC-99	6.1E-01	3.0E+04	1.3E-12	3.9E-08

Total Pathway: 3.9E-08

Radiation Risk

Inhalation/Groundwater

Not applicable

Total Pathway:

Radiation Risk

Dermal Contact/Groundwater

Total Pathway:

Total

3.9E-08

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk

None identified

Total Pathway:

Chemical Risk

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk

None identified

Total Pathway:

Chemical Risk

Dermal Contact/Groundwater

Compound	Intake	SF(derm)	Risk

None identified

Total Pathway:

Total Rad + Chem 3.9E-08

Total Rad + Chem

Total Rad + Chem

Total: 3.9E-08

TABLE B.3.4-20(a)

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard									
Ingestion/Groundwater					Inhalation/Groundwater		Dermal Contact/Groundwater		Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard					
NP-237	6.10E-01	3.0E+04			Not applicable		Not applicable		
Total Pathway:					Total Pathway:		Total Pathway:		

Chemical Hazard											
Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard	
None identified					None identified				None identified				
Total Pathway:					Total Pathway:				Total Pathway:				
Total Rad + Chem					Total Rad + Chem				Total Rad + Chem				*Total:*

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TABLE B.3.4-20(b)

FUTURE, ON-PROPERTY CHILD

SOLID WASTE LANDFILL: GROUNDWATER

Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	6.1E-01	1.3E+03	1.3E-12	1.7E-09	Not applicable		1.7E-09
			Total Pathway:	1.7E-09	Total Pathway:	Total Pathway:	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk
None identified					None identified				None identified			
			Total Pathway:				Total Pathway:				Total Pathway:	
			Total Rad + Chem	1.7E-09			Total Rad + Chem				Total Rad + Chem	*Total:* 1.7E-09

TABLE B.3.4-20(b)

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard			
NP-237	6.10E-01	1.3E+03			Not applicable	Not applicable	
		Total Pathway:			Total Pathway:	Total Pathway:	

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard
None identified					None identified				None identified			
		Total Pathway:				Total Pathway:				Total Pathway:		
		Total Rad + Chem				Total Rad + Chem				Total Rad + Chem		*Total:*

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TABLE B.3.4-21(a)

FUTURE, ON-PROPERTY FARMER (RME VALUES)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	5.09E-03	1.0E+04	2.2E-10	2.2E-06	NP-237	5.10E-03	5.3E+03	2.2E-10	1.2E-06	3.4E-06
PU-238	1.49E-05	2.9E+01	2.2E-10	6.4E-09	PU-238	1.60E-05	1.7E+01	2.2E-10	3.7E-09	1.0E-08
PU-239/240	1.58E-06	3.1E+00	2.3E-10	7.2E-10	PU-239/240	1.70E-06	1.8E+00	2.3E-10	4.1E-10	1.1E-09
RA-226	8.99E-04	1.8E+03	7.8E-10	1.4E-06	RA-226	9.01E-04	9.4E+02	7.8E-10	7.3E-07	2.1E-06
RA-228	1.08E-03	2.1E+03	1.0E-10	2.1E-07	RA-228	1.07E-03	1.1E+03	1.0E-10	1.1E-07	3.2E-07
SR-90	1.02E-01	2.0E+05	3.6E-11	7.2E-06	SR-90	1.02E-01	1.1E+05	3.6E-11	3.8E-06	1.1E-05
TH-228	5.92E-05	1.2E+02	5.5E-11	6.4E-09	TH-228	5.99E-05	6.2E+01	5.5E-11	3.4E-09	9.9E-09
TH-230	2.36E-04	4.6E+02	1.3E-11	6.0E-09	TH-230	2.45E-04	2.6E+02	1.3E-11	3.3E-09	9.4E-09
TH-232	5.49E-05	1.1E+02	1.7E-10	1.8E-08	TH-232	5.72E-05	6.0E+01	1.7E-10	1.0E-08	2.9E-08
U-234	7.21E-02	1.4E+05	1.6E-11	2.3E-06	U-234	7.21E-02	7.5E+04	1.6E-11	1.2E-06	3.5E-06
U-235/236	4.86E-03	9.6E+03	1.6E-11	1.5E-07	U-235/236	4.87E-03	5.1E+03	1.6E-11	8.1E-08	2.3E-07
U-238	1.32E-01	2.6E+05	2.8E-11	7.3E-06	U-238	1.32E-01	1.4E+05	2.8E-11	3.9E-06	1.1E-05
			Total Pathway:	2.1E-05				Total Pathway:	1.1E-05	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	1.71E-02	1.9E-05	1.8E+00	3.3E-05	Arsenic	1.71E-02	1.0E-05	1.8E+00	1.8E-05	5.1E-05
Benzo(a)anthracene	3.25E-03	3.6E-06	7.3E-01	2.6E-06	Benzo(a)anthracene	3.22E-03	1.9E-06	7.3E-01	1.4E-06	4.0E-06
Benzo(a)pyrene	1.68E-03	1.8E-06	7.3E+00	1.3E-05	Benzo(a)pyrene	1.67E-03	9.7E-07	7.3E+00	7.1E-06	2.1E-05
Benzo(b)fluoranthene	3.41E-03	3.8E-06	7.3E-01	2.7E-06	Benzo(b)fluoranthene	3.39E-03	2.0E-06	7.3E-01	1.4E-06	4.2E-06
Benzo(g,h,i)perylene	5.48E-04	6.0E-07			Benzo(g,h,i)perylene	5.45E-04	3.2E-07			
Beryllium	4.48E-04	4.9E-07	4.3E+00	2.1E-06	Beryllium	4.49E-04	2.6E-07	4.3E+00	1.1E-06	3.3E-06
Lead	7.32E-02	8.1E-05			Lead	7.33E-02	4.3E-05			
Dibenzo(a,h)anthracene	3.69E-04	4.1E-07	7.3E+00	3.0E-06	Dibenzo(a,h)anthracene	3.67E-04	2.1E-07	7.3E+00	1.6E-06	4.5E-06
Indeno(1,2,3-cd)pyrene	1.25E-03	1.4E-06	7.3E-01	1.0E-06	Indeno(1,2,3-cd)pyrene	1.24E-03	7.3E-07	7.3E-01	5.3E-07	1.5E-06
TH-TOTAL	5.02E-04	5.5E-07			TH-TOTAL	5.23E-04	3.1E-07			
Phenanthrene	2.01E-02	2.2E-05			Phenanthrene	1.96E-02	1.1E-05			
			Total Pathway:	5.8E-05				Total Pathway:	3.1E-05	
			Total Rad + Chem	7.9E-05				Total Rad + Chem	4.2E-05	*Total:* 1.2E-04

TABLE B.3.4-21(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.1E-03	1.0E+04		
PU-238	1.5E-05	2.9E+01		
PU-239/240	1.6E-06	3.1E+00		
RA-226	9.0E-04	1.8E+03		
RA-228	1.1E-03	2.1E+03		
SR-90	1.0E-01	2.0E+05		
TH-228	5.9E-05	1.2E+02		
TH-230	2.4E-04	4.6E+02		
TH-232	5.5E-05	1.1E+02		
U-234	7.2E-02	1.4E+05		
U-235/236	4.9E-03	9.6E+03		
U-238	1.3E-01	2.6E+05		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.10E-03	5.3E+03		
PU-238	1.60E-05	1.7E+01		
PU-239/240	1.70E-06	1.8E+00		
RA-226	9.01E-04	9.4E+02		
RA-228	1.07E-03	1.1E+03		
SR-90	1.02E-01	1.1E+05		
TH-228	5.99E-05	6.2E+01		
TH-230	2.45E-04	2.6E+02		
TH-232	5.72E-05	6.0E+01		
U-234	7.21E-02	7.5E+04		
U-235/236	4.87E-03	5.1E+03		
U-238	1.32E-01	1.4E+05		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.7E-02	1.9E-05	3.0E-04	6.3E-02
Benzo(a)anthracene	3.2E-03	3.6E-06		
Benzo(a)pyrene	1.7E-03	1.8E-06		
Benzo(b)fluoranthene	3.4E-03	3.8E-06		
Benzo(g,h,i)perylene	5.5E-04	6.0E-07		
Beryllium	4.5E-04	4.9E-07	5.0E-03	9.9E-05
Lead	7.3E-02	8.1E-05		
Dibenzo(a,h)anthracene	3.7E-04	4.1E-07		
Indeno(1,2,3-cd)pyrene	1.3E-03	1.4E-06		
TH-TOTAL	5.0E-04	5.5E-07		
Phenanthrene	2.0E-02	2.2E-05		

Total Pathway: 6.3E-02

Total Rad + Chem 6.3E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.71E-02	1.0E-05	3.0E-04	3.3E-02
Benzo(a)anthracene	3.22E-03	1.9E-06		
Benzo(a)pyrene	1.67E-03	9.7E-07		
Benzo(b)fluoranthene	3.39E-03	2.0E-06		
Benzo(g,h,i)perylene	5.45E-04	3.2E-07		
Beryllium	4.49E-04	2.6E-07	5.0E-03	5.2E-05
Lead	7.33E-02	4.3E-05		
Dibenzo(a,h)anthracene	3.67E-04	2.1E-07		
Indeno(1,2,3-cd)pyrene	1.24E-03	7.3E-07		
TH-TOTAL	5.23E-04	3.1E-07		
Phenanthrene	1.96E-02	1.1E-05		

Total Pathway: 3.3E-02

Total Rad + Chem 3.3E-02

Total	
	9.6E-02
	1.5E-04
Total:	9.6E-02

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TABLE B.3.4-21(a)

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	3.32E-03	6.5E+03	1.3E-12	8.5E-09

Total Pathway: 8.5E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	3.32E-03	3.5E+03	1.3E-12	4.5E-09

Total Pathway: 4.5E-09

Total	Total Dust & Groundwate Affected
	3.4E-06
	1.0E-08
	1.1E-09
	2.1E-06
	3.2E-07
	1.1E-05
	9.9E-09
	9.4E-09
	2.9E-08
	3.5E-06
	2.3E-07
	1.1E-05
1.3E-08	1.3E-08

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem 8.5E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem 4.5E-09

	5.1E-05	
	4.0E-06	
	2.1E-05	
	4.2E-06	
	3.3E-06	
	4.5E-06	
	1.5E-06	
Total:	1.3E-08	1.2E-04

TABLE B.3.4-21(a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.3E-03	6.5E+03		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.32E-03	3.5E+03		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		9.6E-02
		1.5E-04
Total:		9.6E-02

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TABLE B.3.4-21(b)

FUTURE, ON-PROPERTY CHILD

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.09E-03	4.3E+02	2.2E-10	9.4E-08
PU-238	1.49E-05	1.2E+00	2.2E-10	2.7E-10
PU-239/240	1.58E-06	1.3E-01	2.3E-10	3.1E-11
RA-226	8.99E-04	7.5E+01	7.8E-10	5.9E-08
RA-228	1.08E-03	9.1E+01	1.0E-10	9.1E-09
SR-90	1.02E-01	8.6E+03	3.6E-11	3.1E-07
TH-228	5.92E-05	5.0E+00	5.5E-11	2.7E-10
TH-230	2.36E-04	2.0E+01	1.3E-11	2.6E-10
TH-232	5.49E-05	4.6E+00	1.7E-10	7.8E-10
U-234	7.21E-02	6.1E+03	1.6E-11	9.7E-08
U-235/236	4.86E-03	4.1E+02	1.6E-11	6.5E-09
U-238	1.32E-01	1.1E+04	2.8E-11	3.1E-07

Total Pathway: 8.9E-07

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.10E-03	6.5E+02	2.2E-10	1.4E-07
PU-238	1.60E-05	2.1E+00	2.2E-10	4.5E-10
PU-239/240	1.70E-06	2.2E-01	2.3E-10	5.0E-11
RA-226	9.01E-04	1.2E+02	7.8E-10	9.0E-08
RA-228	1.07E-03	1.4E+02	1.0E-10	1.4E-08
SR-90	1.02E-01	1.3E+04	3.6E-11	4.7E-07
TH-228	5.99E-05	7.7E+00	5.5E-11	4.2E-10
TH-230	2.45E-04	3.2E+01	1.3E-11	4.1E-10
TH-232	5.72E-05	7.4E+00	1.7E-10	1.2E-09
U-234	7.21E-02	9.3E+03	1.6E-11	1.5E-07
U-235/236	4.87E-03	6.3E+02	1.6E-11	1.0E-08
U-238	1.32E-01	1.7E+04	2.8E-11	4.8E-07

Total Pathway: 1.4E-06

Total
2.4E-07
7.3E-10
8.1E-11
1.5E-07
2.3E-08
7.8E-07
7.0E-10
6.7E-10
2.0E-09
2.5E-07
1.7E-08
7.9E-07

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.71E-02	3.8E-06	1.8E+00	6.6E-06
Benzo(a)anthracene	3.25E-03	7.1E-07	7.3E-01	5.2E-07
Benzo(a)pyrene	1.68E-03	3.7E-07	7.3E+00	2.7E-06
Benzo(b)fluoranthene	3.41E-03	7.5E-07	7.3E-01	5.5E-07
Benzo(g,h,i)perylene	5.48E-04	1.2E-07		
Beryllium	4.48E-04	9.8E-08	4.3E+00	4.2E-07
Lead	7.32E-02	1.6E-05		
Dibenzo(a,h)anthracene	3.69E-04	8.1E-08	7.3E+00	5.9E-07
Indeno(1,2,3-cd)pyrene	1.25E-03	2.7E-07	7.3E-01	2.0E-07
TH-TOTAL	5.02E-04	1.1E-07		
Phenanthrene	2.01E-02	4.4E-06		

Total Pathway: 1.2E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.71E-02	5.7E-06	1.8E+00	1.0E-05
Benzo(a)anthracene	3.22E-03	1.1E-06	7.3E-01	7.9E-07
Benzo(a)pyrene	1.67E-03	5.6E-07	7.3E+00	4.1E-06
Benzo(b)fluoranthene	3.39E-03	1.1E-06	7.3E-01	8.3E-07
Benzo(g,h,i)perylene	5.45E-04	1.8E-07		
Beryllium	4.49E-04	1.5E-07	4.3E+00	6.5E-07
Lead	7.33E-02	2.5E-05		
Dibenzo(a,h)anthracene	3.67E-04	1.2E-07	7.3E+00	9.0E-07
Indeno(1,2,3-cd)pyrene	1.24E-03	4.2E-07	7.3E-01	3.0E-07
TH-TOTAL	5.23E-04	1.8E-07		
Phenanthrene	1.96E-02	6.6E-06		

Total Pathway: 1.8E-05

1.7E-05
1.3E-06
6.8E-06
1.4E-06
1.1E-06
1.5E-06
5.0E-07

Total Rad + Chem 1.2E-05

Total Rad + Chem 1.9E-05 *Total:* 3.1E-05

TABLE B.3.4-21(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.1E-03	4.3E+02		
PU-238	1.5E-05	1.2E+00		
PU-239/240	1.6E-06	1.3E-01		
RA-226	9.0E-04	7.5E+01		
RA-228	1.1E-03	9.1E+01		
SR-90	1.0E-01	8.6E+03		
TH-228	5.9E-05	5.0E+00		
TH-230	2.4E-04	2.0E+01		
TH-232	5.5E-05	4.6E+00		
U-234	7.2E-02	6.1E+03		
U-235/236	4.9E-03	4.1E+02		
U-238	1.3E-01	1.1E+04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.10E-03	6.5E+02		
PU-238	1.60E-05	2.1E+00		
PU-239/240	1.70E-06	2.2E-01		
RA-226	9.01E-04	1.2E+02		
RA-228	1.07E-03	1.4E+02		
SR-90	1.02E-01	1.3E+04		
TH-228	5.99E-05	7.7E+00		
TH-230	2.45E-04	3.2E+01		
TH-232	5.72E-05	7.4E+00		
U-234	7.21E-02	9.3E+03		
U-235/236	4.87E-03	6.3E+02		
U-238	1.32E-01	1.7E+04		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.7E-02	4.4E-05	3.0E-04	1.5E-01
Benzo(a)anthracene	3.2E-03	8.3E-06		
Benzo(a)pyrene	1.7E-03	4.3E-06		
Benzo(b)fluoranthene	3.4E-03	8.7E-06		
Benzo(g,h,i)perylene	5.5E-04	1.4E-06		
Beryllium	4.5E-04	1.1E-06	5.0E-03	2.3E-04
Lead	7.3E-02	1.9E-04		
Dibenzo(a,h)anthracene	3.7E-04	9.4E-07		
Indeno(1,2,3-cd)pyrene	1.3E-03	3.2E-06		
TH-TOTAL	5.0E-04	1.3E-06		
Phenanthrene	2.0E-02	5.1E-05		

Total Pathway: 1.5E-01

Total Rad + Chem 1.5E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.71E-02	6.7E-05	3.0E-04	2.2E-01
Benzo(a)anthracene	3.22E-03	1.3E-05		
Benzo(a)pyrene	1.67E-03	6.5E-06		
Benzo(b)fluoranthene	3.39E-03	1.3E-05		
Benzo(g,h,i)perylene	5.45E-04	2.1E-06		
Beryllium	4.49E-04	1.8E-06	5.0E-03	3.5E-04
Lead	7.33E-02	2.9E-04		
Dibenzo(a,h)anthracene	3.67E-04	1.4E-06		
Indeno(1,2,3-cd)pyrene	1.24E-03	4.9E-06		
TH-TOTAL	5.23E-04	2.0E-06		
Phenanthrene	1.96E-02	7.7E-05		

Total Pathway: 2.2E-01

Total Rad + Chem 2.2E-01

Total	
	3.7E-01
	5.8E-04
Total:	3.7E-01

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TABLE B.3.4-21(b)

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	3.32E-03	2.8E+02	1.3E-12	3.6E-10

Total Pathway: 3.6E-10

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	3.32E-03	4.3E+02	1.3E-12	5.5E-10

Total Pathway: 5.5E-10

Total	Total Dust & Groundwate Affected
	2.4E-07
	7.3E-10
	8.1E-11
	1.5E-07
	2.3E-08
	7.8E-07
	7.0E-10
	6.7E-10
	2.0E-09
	2.5E-07
	1.7E-08
	7.9E-07
9.2E-10	9.2E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem 3.6E-10

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem 5.5E-10

		1.7E-05
		1.3E-06
		6.8E-06
		1.4E-06
		1.1E-06
		1.5E-06
		5.0E-07
Total:	9.2E-10	3.1E-05

TABLE B.3.4-21(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.3E-03	2.8E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.32E-03	4.3E+02		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

		3.7E-01
		5.8E-04

Total Rad + Chem

Total Rad + Chem

Total:	3.7E-01

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TABLE B.3.4-22(a)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	3.60E-01	6.6E+02	2.2E-10	1.5E-07	NP-237	3.27E-02	2.4E+02	2.2E-10	5.3E-08	2.0E-07
PU-238	2.02E-04	3.7E-01	2.2E-10	8.2E-11	PU-238	4.03E-05	3.0E-01	2.2E-10	6.5E-11	1.5E-10
PU-239/240	2.14E-05	3.9E-02	2.3E-10	9.1E-12	PU-239/240	4.29E-06	3.1E-02	2.3E-10	7.2E-12	1.6E-11
RA-226	4.38E-01	8.0E+02	7.8E-10	6.3E-07	RA-226	7.88E-01	5.8E+03	7.8E-10	4.5E-06	5.1E-06
RA-228	5.17E-01	9.5E+02	1.0E-10	9.5E-08	RA-228	9.36E-01	6.9E+03	1.0E-10	6.9E-07	7.8E-07
SR-90	3.58E+01	6.6E+04	3.6E-11	2.4E-06	SR-90	1.79E+02	1.3E+06	3.6E-11	4.7E-05	5.0E-05
TH-228	5.19E-03	9.5E+00	5.5E-11	5.2E-10	TH-228	4.40E-03	3.2E+01	5.5E-11	1.8E-09	2.3E-09
TH-230	2.1E-02	3.9E+01	1.30E-11	5.0E-10	TH-230	1.76E-02	1.3E+02	1.3E-11	1.7E-09	2.2E-09
TH-232	4.92E-03	9.0E+00	1.7E-10	1.5E-09	TH-232	4.10E-03	3.0E+01	1.7E-10	5.1E-09	6.7E-09
U-234	7.79E+00	1.4E+04	1.6E-11	2.3E-07	U-234	2.34E+01	1.7E+05	1.6E-11	2.7E-06	3.0E-06
U-235/236	5.25E-01	9.7E+02	1.6E-11	1.5E-08	U-235/236	1.58E+00	1.2E+04	1.6E-11	1.9E-07	2.0E-07
U-238	1.43E+01	2.6E+04	2.8E-11	7.3E-07	U-238	4.29E+01	3.1E+05	2.8E-11	8.8E-06	9.6E-06
			Total Pathway:	4.2E-06				Total Pathway:	6.4E-05	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.34E-02	3.4E-05	1.8E+00	6.0E-05	Arsenic	1.00E-03	4.1E-06	1.8E+00	7.2E-06	6.7E-05
Benzo(a)anthracene	6.38E-03	6.6E-06	7.3E-01	4.8E-06	Benzo(a)anthracene	2.03E-03	8.3E-06	7.3E-01	6.1E-06	1.1E-05
Benzo(a)pyrene	1.15E-02	1.2E-05	7.3E+00	8.6E-05	Benzo(a)pyrene	3.64E-03	1.5E-05	7.3E+00	1.1E-04	2.0E-04
Benzo(b)fluoranthene	2.47E-02	2.5E-05	7.3E-01	1.8E-05	Benzo(b)fluoranthene	7.84E-03	3.2E-05	7.3E-01	2.4E-05	4.2E-05
Benzo(g,h,i)perylene	1.33E-01	1.4E-04			Benzo(g,h,i)perylene	4.23E-02	1.7E-04			
Beryllium	6.98E-04	7.2E-07	4.3E+00	3.1E-06	Beryllium	6.29E-07	2.6E-09	4.3E+00	1.1E-08	3.1E-06
Lead	1.57E-02	1.6E-05			Lead	1.31E-02	5.4E-05			
Dibenzo(a,h)anthracene	2.47E-02	2.5E-05	7.3E+00	1.9E-04	Dibenzo(a,h)anthracene	7.84E-03	3.2E-05	7.3E+00	2.4E-04	4.2E-04
Indeno(1,2,3-cd)pyrene	3.66E-02	3.8E-05	7.3E-01	2.7E-05	Indeno(1,2,3-cd)pyrene	1.16E-02	4.8E-05	7.3E-01	3.5E-05	6.2E-05
TH-TOTAL	4.49E-05	4.6E-08			TH-TOTAL	3.74E-05	1.5E-07			
Phenanthrene	2.32E-03	2.4E-06			Phenanthrene	7.44E-04	3.1E-06			
			Total Pathway:	3.9E-04				Total Pathway:	4.2E-04	

Total Rad + Chem 3.9E-04 | Total Rad + Chem 4.8E-04 | *Total:* 8.7E-04

TABLE B.3.4-22(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	3.60E-01	6.6E+02			NP-237	3.3E-02	2.4E+02			
PU-238	2.02E-04	3.7E-01			PU-238	4.0E-05	3.0E-01			
PU-239/240	2.14E-05	3.9E-02			PU-239/240	4.3E-06	3.1E-02			
RA-226	4.38E-01	8.0E+02			RA-226	7.9E-01	5.8E+03			
RA-228	5.17E-01	9.5E+02			RA-228	9.4E-01	6.9E+03			
SR-90	3.58E+01	6.6E+04			SR-90	1.8E+02	1.3E+06			
TH-228	5.19E-03	9.5E+00			TH-228	4.4E-03	3.2E+01			
TH-230	2.11E-02	3.9E+01			TH-230	1.8E-02	1.3E+02			
TH-232	4.92E-03	9.0E+00			TH-232	4.1E-03	3.0E+01			
U-234	7.79E+00	1.4E+04			U-234	2.3E+01	1.7E+05			
U-235/236	5.25E-01	9.7E+02			U-235/236	1.6E+00	1.2E+04			
U-238	1.43E+01	2.6E+04			U-238	4.3E+01	3.1E+05			
Total Pathway:					Total Pathway:					

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	3.34E-02	3.4E-05	3.0E-04	1.1E-01	Arsenic	1.0E-03	4.1E-06	3.0E-04	1.4E-02	1.3E-01
Benzo(a)anthracene	6.38E-03	6.6E-06			Benzo(a)anthracene	2.0E-03	8.3E-06			
Benzo(a)pyrene	1.15E-02	1.2E-05			Benzo(a)pyrene	3.6E-03	1.5E-05			
Benzo(b)fluoranthene	2.47E-02	2.5E-05			Benzo(b)fluoranthene	7.8E-03	3.2E-05			
Benzo(g,h,i)perylene	1.33E-01	1.4E-04			Benzo(g,h,i)perylene	4.2E-02	1.7E-04			
Beryllium	6.98E-04	7.2E-07	5.0E-03	1.4E-04	Beryllium	6.3E-07	2.6E-09	5.0E-03	5.2E-07	1.4E-04
Lead	1.57E-02	1.6E-05			Lead	1.3E-02	5.4E-05			
Dibenzo(a,h)anthracene	2.47E-02	2.5E-05			Dibenzo(a,h)anthracene	7.8E-03	3.2E-05			
Indeno(1,2,3-cd)pyrene	3.66E-02	3.8E-05			Indeno(1,2,3-cd)pyrene	1.2E-02	4.8E-05			
TH-TOTAL	4.49E-05	4.6E-08			TH-TOTAL	3.7E-05	1.5E-07			
Phenanthrene	2.32E-03	2.4E-06			Phenanthrene	7.4E-04	3.1E-06			
			Total Pathway:	1.1E-01				Total Pathway:	1.4E-02	

Total Rad + Chem 1.1E-01 | Total Rad + Chem 1.4E-02 | *Total:* 1.3E-01

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TABLE B.3.4-22(a)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			2.0E-07
PU-238			2.2E-10		PU-238			2.2E-10			1.5E-10
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.6E-11
RA-226			7.8E-10		RA-226			7.8E-10			5.1E-06
RA-228			1.0E-10		RA-228			1.0E-10			7.8E-07
SR-90			3.6E-11		SR-90			3.6E-11			5.0E-05
TH-228			5.5E-11		TH-228			5.5E-11			2.3E-09
TH-230			1.3E-11		TH-230			1.3E-11			2.2E-09
TH-232			1.7E-10		TH-232			1.7E-10			6.7E-09
U-234			1.6E-11		U-234			1.6E-11			3.0E-06
U-235/236			1.6E-11		U-235/236			1.6E-11			2.0E-07
U-238			2.8E-11		U-238			2.8E-11			9.6E-06
TC-99	2.55E+00	4.7E+03	1.3E-12	6.1E-09	TC-99	3.07E+00	2.3E+04	1.3E-12	2.9E-08	3.5E-08	3.5E-08
			Total Pathway:	6.1E-09				Total Pathway:	2.9E-08		

Chemical Risk

Ingestion of Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			6.7E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			1.1E-05
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			2.0E-04
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			4.2E-05
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			4.3E+00		Beryllium			4.3E+00			3.1E-06
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			4.2E-04
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			6.2E-05
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
			Total Pathway:					Total Pathway:			

Total Rad + Chem 6.1E-09 Total Rad + Chem 2.9E-08 *Total:* 3.5E-08 8.7E-04

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TABLE B.3.4-22(a)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk				
Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237					NP-237				
PU-238					PU-238				
PU-239/240					PU-239/240				
RA-226					RA-226				
RA-228					RA-228				
SR-90					SR-90				
TH-228					TH-228				
TH-230					TH-230				
TH-232					TH-232				
U-234					U-234				
U-235/236					U-235/236				
U-238					U-238				
TC-99	2.55E+00	4.7E+03			TC-99	3.1E+00	2.3E+04		
Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion of Beef					Ingestion/Milk				
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04		Arsenic			3.0E-04	
Benzo(a)anthracene					Benzo(a)anthracene				
Benzo(a)pyrene					Benzo(a)pyrene				
Benzo(b)fluoranthene					Benzo(b)fluoranthene				
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Beryllium			5.0E-03		Beryllium			5.0E-03	
Lead					Lead				
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene				
TH-TOTAL					TH-TOTAL				
Phenanthrene					Phenanthrene				
Total Pathway:					Total Pathway:				
Total Rad + Chem					Total Rad + Chem				

	Total	Total Dust & Groundwater Affected
		1.3E-01
		1.4E-04
Total:		1.3E-01

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TABLE B.3.4-22(b)
FUTURE, ON-PROPERTY CHILD
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	3.60E-01	2.2E+01	2.2E-10	4.8E-09	NP-237	3.27E-02	4.7E+01	2.2E-10	1.0E-08	1.5E-08
PU-238	2.02E-04	1.2E-02	2.2E-10	2.7E-12	PU-238	4.03E-05	5.8E-02	2.2E-10	1.3E-11	1.5E-11
PU-239/240	2.14E-05	1.3E-03	2.3E-10	3.0E-13	PU-239/240	4.29E-06	6.1E-03	2.3E-10	1.4E-12	1.7E-12
RA-226	4.38E-01	2.7E+01	7.8E-10	2.1E-08	RA-226	7.88E-01	1.1E+03	7.8E-10	8.8E-07	9.0E-07
RA-228	5.17E-01	3.1E+01	1.0E-10	3.1E-09	RA-228	9.36E-01	1.3E+03	1.0E-10	1.3E-07	1.4E-07
SR-90	3.58E+01	2.2E+03	3.6E-11	7.8E-08	SR-90	1.79E+02	2.6E+05	3.6E-11	9.2E-06	9.3E-06
TH-228	5.19E-03	3.2E-01	5.5E-11	1.7E-11	TH-228	4.40E-03	6.3E+00	5.5E-11	3.5E-10	3.6E-10
TH-230	2.1E-02	1.3E+00	1.3E-11	1.7E-11	TH-230	1.76E-02	2.5E+01	1.3E-11	3.3E-10	3.4E-10
TH-232	4.92E-03	3.0E-01	1.7E-10	5.1E-11	TH-232	4.10E-03	5.9E+00	1.7E-10	9.9E-10	1.0E-09
U-234	7.79E+00	4.7E+02	1.6E-11	7.6E-09	U-234	2.34E+01	3.3E+04	1.6E-11	5.3E-07	5.4E-07
U-235/236	5.25E-01	3.2E+01	1.6E-11	5.1E-10	U-235/236	1.58E+00	2.3E+03	1.6E-11	3.6E-08	3.7E-08
U-238	1.43E+01	8.7E+02	2.8E-11	2.4E-08	U-238	4.29E+01	6.1E+04	2.8E-11	1.7E-06	1.7E-06
			Total Pathway:	1.4E-07				Total Pathway:	1.3E-05	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.34E-02	5.3E-06	1.8E+00	9.3E-06	Arsenic	1.00E-03	3.7E-06	1.8E+00	6.5E-06	1.6E-05
Benzo(a)anthracene	6.38E-03	1.0E-06	7.3E-01	7.4E-07	Benzo(a)anthracene	2.03E-03	7.5E-06	7.3E-01	5.5E-06	6.3E-06
Benzo(a)pyrene	1.15E-02	1.8E-06	7.3E+00	1.3E-05	Benzo(a)pyrene	3.64E-03	1.4E-05	7.3E+00	9.9E-05	1.1E-04
Benzo(b)fluoranthene	2.47E-02	3.9E-06	7.3E-01	2.9E-06	Benzo(b)fluoranthene	7.84E-03	2.9E-05	7.3E-01	2.1E-05	2.4E-05
Benzo(g,h,i)perylene	1.33E-01	2.1E-05			Benzo(g,h,i)perylene	4.23E-02	1.6E-04			
Beryllium	6.98E-04	1.1E-07	4.3E+00	4.8E-07	Beryllium	6.29E-07	2.3E-09	4.3E+00	1.0E-08	4.9E-07
Lead	1.57E-02	2.5E-06			Lead	1.31E-02	4.9E-05			
Dibenzo(a,h)anthracene	2.47E-02	3.9E-06	7.3E+00	2.9E-05	Dibenzo(a,h)anthracene	7.84E-03	2.9E-05	7.3E+00	2.1E-04	2.4E-04
Indeno(1,2,3-cd)pyrene	3.66E-02	5.8E-06	7.3E-01	4.2E-06	Indeno(1,2,3-cd)pyrene	1.16E-02	4.3E-05	7.3E-01	3.2E-05	3.6E-05
TH-TOTAL	4.49E-05	7.1E-09			TH-TOTAL	3.74E-05	1.4E-07			
Phenanthrene	2.32E-03	3.7E-07			Phenanthrene	7.44E-04	2.8E-06			
			Total Pathway:	6.0E-05				Total Pathway:	3.8E-04	

Total Rad + Chem 6.0E-05 | Total Rad + Chem 3.9E-04 | *Total:* 4.5E-04

TABLE B.3.4-22(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237	3.60E-01	2.2E+01			NP-237	3.3E-02	4.7E+01			
PU-238	2.02E-04	1.2E-02			PU-238	4.0E-05	5.8E-02			
PU-239/240	2.14E-05	1.3E-03			PU-239/240	4.3E-06	6.1E-03			
RA-226	4.38E-01	2.7E+01			RA-226	7.9E-01	1.1E+03			
RA-228	5.17E-01	3.1E+01			RA-228	9.4E-01	1.3E+03			
SR-90	3.58E+01	2.2E+03			SR-90	1.8E+02	2.6E+05			
TH-228	5.19E-03	3.2E-01			TH-228	4.4E-03	6.3E+00			
TH-230	2.11E-02	1.3E+00			TH-230	1.8E-02	2.5E+01			
TH-232	4.92E-03	3.0E-01			TH-232	4.1E-03	5.9E+00			
U-234	7.79E+00	4.7E+02			U-234	2.3E+01	3.3E+04			
U-235/236	5.25E-01	3.2E+01			U-235/236	1.6E+00	2.3E+03			
U-238	1.43E+01	8.7E+02			U-238	4.3E+01	6.1E+04			
		Total Pathway:		0.0E+00			Total Pathway:		0.0E+00	

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	3.34E-02	6.2E-05	3.0E-04	2.1E-01	Arsenic	1.0E-03	4.4E-05	3.0E-04	1.5E-01	3.5E-01
Benzo(a)anthracene	6.38E-03	1.2E-05			Benzo(a)anthracene	2.0E-03	8.8E-05			
Benzo(a)pyrene	1.15E-02	2.1E-05			Benzo(a)pyrene	3.6E-03	1.6E-04			
Benzo(b)fluoranthene	2.47E-02	4.6E-05			Benzo(b)fluoranthene	7.8E-03	3.4E-04			
Benzo(g,h,i)perylene	1.33E-01	2.5E-04			Benzo(g,h,i)perylene	4.2E-02	1.8E-03			
Beryllium	6.98E-04	1.3E-06	5.0E-03	2.6E-04	Beryllium	6.3E-07	2.7E-08	5.0E-03	5.5E-06	2.6E-04
Lead	1.57E-02	2.9E-05			Lead	1.3E-02	5.7E-04			
Dibenzo(a,h)anthracene	2.47E-02	4.6E-05			Dibenzo(a,h)anthracene	7.8E-03	3.4E-04			
Indeno(1,2,3-cd)pyrene	3.66E-02	6.8E-05			Indeno(1,2,3-cd)pyrene	1.2E-02	5.0E-04			
TH-TOTAL	4.49E-05	8.3E-08			TH-TOTAL	3.7E-05	1.6E-06			
Phenanthrene	2.32E-03	4.3E-06			Phenanthrene	7.4E-04	3.2E-05			
		Total Pathway:		2.1E-01			Total Pathway:		1.5E-01	
		Total Rad + Chem		2.1E-01			Total Rad + Chem		1.5E-01	*Total:* 3.5E-01

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TABLE B.3.4-22(b)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	2.55E+00	1.6E+02	1.3E-12	2.0E-10

Total Pathway: 2.0E-10

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	3.07E+00	4.4E+03	1.3E-12	5.7E-09

Total Pathway: 5.7E-09

Total	Total Dust & Groundwater Affected
	1.5E-08
	1.5E-11
	1.7E-12
	9.0E-07
	1.4E-07
	9.3E-06
	3.6E-10
	3.4E-10
	1.0E-09
	5.4E-07
	3.7E-08
	1.7E-06
5.9E-09	5.9E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total	Total Dust & Groundwater Affected
	1.6E-05
	6.3E-06
	1.1E-04
	2.4E-05
	4.9E-07
	2.4E-04
	3.6E-05

Total Rad + Chem 2.0E-10

Total Rad + Chem 5.7E-09 *Total:* 5.9E-09 4.5E-04

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TABLE B.3.4-22(b)
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.55E+00	1.6E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.1E+00	4.4E+03		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

		3.5E-01
		2.6E-04

Total Rad + Chem

Total Rad + Chem

Total:	3.5E-01

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TABLE B.3.4-23
FUTURE, ON-PROPERTY FARMER (CT VALUES)
SOLID WASTE LANDFILL: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237	1.08E-04	9.3E-01	2.9E-08	2.7E-08
PU-238	7.03E-05	6.0E-01	3.9E-08	2.3E-08
PU-239/240	7.46E-06	6.4E-02	3.8E-08	2.4E-09
RA-226	1.78E-04	1.5E+00	7.0E-09	1.1E-08
RA-228	1.53E-04	1.3E+00	6.9E-10	9.0E-10
SR-90	8.69E-05	7.4E-01	6.2E-11	4.6E-11
TH-228	1.48E-04	1.3E+00	7.8E-08	9.9E-08
TH-230	5.89E-04	5.0E+00	2.9E-08	1.5E-07
TH-232	1.38E-04	1.2E+00	1.1E-07	1.3E-07
U-234	3.83E-03	3.3E+01	2.6E-08	8.5E-07
U-235/236	2.58E-04	2.2E+00	2.5E-08	5.5E-08
U-238	7.02E-03	6.0E+01	5.2E-08	3.1E-06

Total Pathway: 4.5E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237	1.19E+00	2.5E+02	2.2E-10	5.5E-08
PU-238	7.72E-01	1.6E+02	2.2E-10	3.6E-08
PU-239/240	8.20E-02	1.7E+01	2.3E-10	4.0E-09
RA-226	1.40E+00	2.9E+02	7.8E-10	2.3E-07
RA-228	1.68E+00	3.5E+02	1.0E-10	3.5E-08
SR-90	9.55E-01	2.0E+02	3.6E-11	7.2E-09
TH-228	1.63E+00	3.4E+02	5.5E-11	1.9E-08
TH-230	6.48E+00	1.4E+03	1.3E-11	1.8E-08
TH-232	1.51E+00	3.2E+02	1.7E-10	5.4E-08
U-234	4.21E+01	8.9E+03	1.6E-11	1.4E-07
U-235/236	2.84E+00	6.0E+02	1.6E-11	9.6E-09
U-238	7.72E+01	1.6E+04	2.8E-11	4.6E-07

Total Pathway: 1.1E-06

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	6.07E-07	2.9E-09	1.5E+01	4.4E-08
Benzo(a)anthracene	3.35E-08	1.6E-10	6.1E-01	9.8E-11
Benzo(a)pyrene	3.09E-08	1.5E-10	6.1E+00	9.0E-10
Benzo(b)fluoranthene	6.46E-08	3.1E-10	6.1E-01	1.9E-10
Benzo(g,h,i)perylene	4.58E-08	2.2E-10		
Beryllium	6.35E-08	3.0E-10	8.4E+00	2.6E-09
Lead	1.73E-06	8.3E-09		
Dibenzo(a,h)anthracene	1.82E-08	8.7E-11	6.1E+00	5.3E-10
Indeno(1,2,3-cd)pyrene	4.37E-08	2.1E-10	6.1E-01	1.3E-10
TH-TOTAL	1.25E-06	6.0E-09		
Phenanthrene	4.86E-08	2.3E-10		

Total Pathway: 4.8E-08

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	6.67E+00	7.9E-07	1.8E+00	1.4E-06
Benzo(a)anthracene	3.66E-01	4.3E-08	7.3E-01	3.1E-08
Benzo(a)pyrene	3.40E-01	4.0E-08	7.3E+00	2.9E-07
Benzo(b)fluoranthene	7.10E-01	8.4E-08	7.3E-01	6.1E-08
Benzo(g,h,i)perylene	5.00E-01	5.9E-08		
Beryllium	6.98E-01	8.2E-08	4.3E+00	3.5E-07
Lead	1.90E+01	2.2E-06		
Dibenzo(a,h)anthracene	2.00E-01	2.4E-08	7.3E+00	1.7E-07
Indeno(1,2,3-cd)pyrene	4.80E-01	5.7E-08	7.3E-01	4.1E-08
TH-TOTAL	1.38E+01	1.6E-06		
Phenanthrene	5.31E-01	6.3E-08		

Total Pathway: 2.3E-06

Total Rad + Chem 4.5E-06

Total Rad + Chem 3.4E-06

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TABLE B.3.4-23
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237	4.1E+00	4.30E-07	1.8E-06	1.9E-06
	PU-238	2.7E+00	2.80E-11	7.5E-11	5.9E-08
	PU-239/240	2.8E-01	2.70E-11	7.7E-12	6.4E-09
	RA-226	4.9E+00	6.00E-06	2.9E-05	2.9E-05
	RA-228	5.8E+00	2.90E-06	1.7E-05	1.7E-05
	SR-90	3.3E+00			7.3E-09
	TH-228	5.7E+00	5.60E-06	3.2E-05	3.2E-05
	TH-230	2.3E+01	5.40E-11	1.2E-09	1.7E-07
	TH-232	5.2E+00	8.50E-06	4.5E-05	4.5E-05
	U-234	1.5E+02	3.00E-11	4.4E-09	1.0E-06
	U-235/236	9.9E+00	2.40E-07	2.4E-06	2.4E-06
	U-238	2.7E+02	3.60E-08	9.7E-06	1.3E-05
Total Pathway:	Total Pathway: 1.4E-04				

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	7.9E-09	1.8E+00	1.4E-08					1.4E-06
Benzo(a)anthracene			3.1E-08					6.3E-08
Benzo(a)pyrene			2.9E-07					5.9E-07
Benzo(b)fluoranthene			6.1E-08					1.2E-07
Benzo(g,h,i)perylene	1.8E-07							
Beryllium	8.2E-09		3.5E-07	Not applicable				7.1E-07
Lead	2.2E-07							
Dibenzo(a,h)anthracene			1.7E-07					3.4E-07
Indeno(1,2,3-cd)pyrene			4.1E-08					8.3E-08
TH-TOTAL	1.6E-07							
Phenanthrene	1.9E-07							
Total Pathway: 9.7E-07				Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 9.7E-07 1.4E-04 *Total:* 1.5E-04

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TABLE B.3.4-23
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237	1.08E-04	9.3E-01		
PU-238	7.03E-05	6.0E-01		
PU-239/240	7.46E-06	6.4E-02		
RA-226	1.78E-04	1.5E+00		
RA-228	1.53E-04	1.3E+00		
SR-90	8.69E-05	7.4E-01		
TH-228	1.48E-04	1.3E+00		
TH-230	5.89E-04	5.0E+00		
TH-232	1.38E-04	1.2E+00		
U-234	3.83E-03	3.3E+01		
U-235/236	2.58E-04	2.2E+00		
U-238	7.02E-03	6.0E+01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237	1.19E+00	2.5E+02		
PU-238	7.72E-01	1.6E+02		
PU-239/240	8.20E-02	1.7E+01		
RA-226	1.40E+00	2.9E+02		
RA-228	1.68E+00	3.5E+02		
SR-90	9.55E-01	2.0E+02		
TH-228	1.63E+00	3.4E+02		
TH-230	6.48E+00	1.4E+03		
TH-232	1.51E+00	3.2E+02		
U-234	4.21E+01	8.9E+03		
U-235/236	2.84E+00	6.0E+02		
U-238	7.72E+01	1.6E+04		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	6.07E-07	2.3E-08		
Benzo(a)anthracene	3.35E-08	1.2E-09		
Benzo(a)pyrene	3.09E-08	1.2E-09		
Benzo(b)fluoranthene	6.46E-08	2.4E-09		
Benzo(g,h,i)perylene	4.58E-08	1.7E-09		
Beryllium	6.35E-08	2.4E-09		
Lead	1.73E-06	6.4E-08		
Dibenzo(a,h)anthracene	1.82E-08	6.8E-10		
Indeno(1,2,3-cd)pyrene	4.37E-08	1.6E-09		
TH-TOTAL	1.25E-06	4.7E-08		
Phenanthrene	4.86E-08	1.8E-09		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	6.67E+00	6.1E-06	3.0E-04	2.0E-02
Benzo(a)anthracene	3.66E-01	3.4E-07		
Benzo(a)pyrene	3.40E-01	3.1E-07		
Benzo(b)fluoranthene	7.10E-01	6.5E-07		
Benzo(g,h,i)perylene	5.00E-01	4.6E-07		
Beryllium	6.98E-01	6.4E-07	5.0E-03	1.3E-04
Lead	1.90E+01	1.7E-05		
Dibenzo(a,h)anthracene	2.00E-01	1.8E-07		
Indeno(1,2,3-cd)pyrene	4.80E-01	4.4E-07		
TH-TOTAL	1.38E+01	1.3E-05		
Phenanthrene	5.31E-01	4.9E-07		

Total Pathway: 2.0E-02

Total Rad + Chem

Total Rad + Chem 2.0E-02

TABLE B.3.4-23
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237	4.1E+00		
	PU-238	2.7E+00		
	PU-239/240	2.8E-01		
	RA-226	4.9E+00		
	RA-228	5.8E+00		
	SR-90	3.3E+00		
	TH-228	5.7E+00		
	TH-230	2.3E+01		
	TH-232	5.2E+00		
	U-234	1.5E+02		
	U-235/236	9.9E+00		
	U-238	2.7E+02		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	6.1E-08	2.9E-04	2.1E-04					2.1E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.4E-06							
Beryllium	6.4E-08	5.0E-05	1.3E-03					1.4E-03
Lead	1.7E-06			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	1.3E-06							
Phenanthrene	1.5E-06							
Total Pathway:			1.5E-03	Total Pathway:				

Total Rad + Chem 1.5E-03

Total: 2.2E-02

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TABLE B.3.4-24

FUTURE, ON-PROPERTY FARMER (CT VALUES)

SOLID WASTE LANDFILL: GROUNDWATER

Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	6.1E-01	1.8E+03	1.3E-12	2.3E-09	Not applicable		2.3E-09
			Total Pathway:	2.3E-09	Total Pathway:	Total Pathway:	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk
None identified					None identified				None identified			
			Total Pathway:				Total Pathway:				Total Pathway:	
			Total Rad + Chem	2.3E-09			Total Rad + Chem				Total Rad + Chem	*Total:* 2.3E-09

TABLE B.3.4-24

(continued)

SOLID WASTE LANDFILL: GROUNDWATER

Non-carcinogenic Hazard

Radiation Hazard									
Ingestion/Groundwater					Inhalation/Groundwater		Dermal Contact/Groundwater		Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard					
NP-237	6.10E-01	1.8E+03			Not applicable		Not applicable		
Total Pathway:					Total Pathway:		Total Pathway:		

Chemical Hazard											
Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard	Compound	Intake	RfD(derm)	Hazard
None identified					None identified				None identified			
Total Pathway:					Total Pathway:				Total Pathway:			
Total Rad + Chem					Total Rad + Chem				Total Rad + Chem			*Total:*

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TABLE B.3.4-25

FUTURE, ON-PROPERTY FARMER (CT VALUES)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.09E-03	5.4E+02	2.2E-10	1.2E-07
PU-238	1.49E-05	1.6E+00	2.2E-10	3.5E-10
PU-239/240	1.58E-06	1.7E-01	2.3E-10	3.8E-11
RA-226	8.99E-04	9.5E+01	7.8E-10	7.4E-08
RA-228	1.08E-03	1.1E+02	1.0E-10	1.1E-08
SR-90	1.02E-01	1.1E+04	3.6E-11	3.9E-07
TH-228	5.92E-05	6.3E+00	5.5E-11	3.4E-10
TH-230	2.36E-04	2.5E+01	1.3E-11	3.2E-10
TH-232	5.49E-05	5.8E+00	1.7E-10	9.9E-10
U-234	7.21E-02	7.6E+03	1.6E-11	1.2E-07
U-235/236	4.86E-03	5.1E+02	1.6E-11	8.2E-09
U-238	1.32E-01	1.4E+04	2.8E-11	3.9E-07

Total Pathway: 1.1E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237	5.10E-03	3.0E+02	2.2E-10	6.7E-08
PU-238	1.60E-05	9.6E-01	2.2E-10	2.1E-10
PU-239/240	1.70E-06	1.0E-01	2.3E-10	2.3E-11
RA-226	9.01E-04	5.4E+01	7.8E-10	4.2E-08
RA-228	1.07E-03	6.4E+01	1.0E-10	6.4E-09
SR-90	1.02E-01	6.1E+03	3.6E-11	2.2E-07
TH-228	5.99E-05	3.6E+00	5.5E-11	2.0E-10
TH-230	2.45E-04	1.5E+01	1.3E-11	1.9E-10
TH-232	5.72E-05	3.4E+00	1.7E-10	5.8E-10
U-234	7.21E-02	4.3E+03	1.6E-11	6.9E-08
U-235/236	4.87E-03	2.9E+02	1.6E-11	4.7E-09
U-238	1.32E-01	7.9E+03	2.8E-11	2.2E-07

Total Pathway: 6.3E-07

Total
1.9E-07
5.6E-10
6.2E-11
1.2E-07
1.8E-08
6.1E-07
5.4E-10
5.2E-10
1.6E-09
1.9E-07
1.3E-08
6.1E-07

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.71E-02	1.0E-06	1.8E+00	1.8E-06
Benzo(a)anthracene	3.25E-03	1.9E-07	7.3E-01	1.4E-07
Benzo(a)pyrene	1.68E-03	9.9E-08	7.3E+00	7.3E-07
Benzo(b)fluoranthene	3.41E-03	2.0E-07	7.3E-01	1.5E-07
Benzo(g,h,i)perylene	5.48E-04	3.2E-08		
Beryllium	4.48E-04	2.7E-08	4.3E+00	1.1E-07
Lead	7.32E-02	4.3E-06		
Dibenzo(a,h)anthracene	3.69E-04	2.2E-08	7.3E+00	1.6E-07
Indeno(1,2,3-cd)pyrene	1.25E-03	7.4E-08	7.3E-01	5.4E-08
TH-TOTAL	5.02E-04	3.0E-08		
Phenanthrene	2.01E-02	1.2E-06		

Total Pathway: 3.1E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.71E-02	5.7E-07	1.8E+00	1.0E-06
Benzo(a)anthracene	3.22E-03	1.1E-07	7.3E-01	7.9E-08
Benzo(a)pyrene	1.67E-03	5.6E-08	7.3E+00	4.1E-07
Benzo(b)fluoranthene	3.39E-03	1.1E-07	7.3E-01	8.3E-08
Benzo(g,h,i)perylene	5.45E-04	1.8E-08		
Beryllium	4.49E-04	1.5E-08	4.3E+00	6.5E-08
Lead	7.33E-02	2.5E-06		
Dibenzo(a,h)anthracene	3.67E-04	1.2E-08	7.3E+00	9.0E-08
Indeno(1,2,3-cd)pyrene	1.24E-03	4.2E-08	7.3E-01	3.0E-08
TH-TOTAL	5.23E-04	1.7E-08		
Phenanthrene	1.96E-02	6.5E-07		

Total Pathway: 1.8E-06

Total
2.8E-06
2.2E-07
1.1E-06
2.3E-07
1.8E-07
2.5E-07
8.4E-08

Total Rad + Chem 4.2E-06

Total Rad + Chem 2.4E-06

Total: 6.6E-06

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TABLE B.3.4-25
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237	5.1E-03				NP-237	5.10E-03				
PU-238	1.5E-05				PU-238	1.60E-05				
PU-239/240	1.6E-06				PU-239/240	1.70E-06				
RA-226	9.0E-04				RA-226	9.01E-04				
RA-228	1.1E-03				RA-228	1.07E-03				
SR-90	1.0E-01				SR-90	1.02E-01				
TH-228	5.9E-05				TH-228	5.99E-05				
TH-230	2.4E-04				TH-230	2.45E-04				
TH-232	5.5E-05				TH-232	5.72E-05				
U-234	7.2E-02				U-234	7.21E-02				
U-235/236	4.9E-03				U-235/236	4.87E-03				
U-238	1.3E-01				U-238	1.32E-01				
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	1.7E-02	7.9E-06	3.0E-04	2.6E-02	Arsenic	1.71E-02	4.5E-06	3.0E-04	1.5E-02	4.1E-02
Benzo(a)anthracene	3.2E-03	1.5E-06			Benzo(a)anthracene	3.22E-03	8.4E-07			
Benzo(a)pyrene	1.7E-03	7.7E-07			Benzo(a)pyrene	1.67E-03	4.3E-07			
Benzo(b)fluoranthene	3.4E-03	1.6E-06			Benzo(b)fluoranthene	3.39E-03	8.8E-07			
Benzo(g,h,i)perylene	5.5E-04	2.5E-07			Benzo(g,h,i)perylene	5.45E-04	1.4E-07			
Beryllium	4.5E-04	2.1E-07	5.0E-03	4.1E-05	Beryllium	4.49E-04	1.2E-07	5.0E-03	2.3E-05	6.5E-05
Lead	7.3E-02	3.4E-05			Lead	7.33E-02	1.9E-05			
Dibenzo(a,h)anthracene	3.7E-04	1.7E-07			Dibenzo(a,h)anthracene	3.67E-04	9.6E-08			
Indeno(1,2,3-cd)pyrene	1.3E-03	5.8E-07			Indeno(1,2,3-cd)pyrene	1.24E-03	3.2E-07			
TH-TOTAL	5.0E-04	2.3E-07			TH-TOTAL	5.23E-04	1.4E-07			
Phenanthrene	2.0E-02	9.2E-06			Phenanthrene	1.96E-02	5.1E-06			
		Total Pathway:		2.6E-02			Total Pathway:		1.5E-02	
		Total Rad + Chem		2.6E-02			Total Rad + Chem		1.5E-02	*Total:* 4.1E-02

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TABLE B.3.4-25

(continued)

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwate Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			1.9E-07
PU-238			2.2E-10		PU-238			2.2E-10			5.6E-10
PU-239/240			2.3E-10		PU-239/240			2.3E-10			6.2E-11
RA-226			7.8E-10		RA-226			7.8E-10			1.2E-07
RA-228			1.0E-10		RA-228			1.0E-10			1.8E-08
SR-90			3.6E-11		SR-90			3.6E-11			6.1E-07
TH-228			5.5E-11		TH-228			5.5E-11			5.4E-10
TH-230			1.3E-11		TH-230			1.3E-11			5.2E-10
TH-232			1.7E-10		TH-232			1.7E-10			1.6E-09
U-234			1.6E-11		U-234			1.6E-11			1.9E-07
U-235/236			1.6E-11		U-235/236			1.6E-11			1.3E-08
U-238			2.8E-11		U-238			2.8E-11			6.1E-07
TC-99	3.32E-03	3.5E+02	1.3E-12	4.6E-10	TC-99	3.32E-03	2.0E+02	1.3E-12	2.6E-10	7.1E-10	7.1E-10
			Total Pathway:	4.6E-10				Total Pathway:	2.6E-10		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			2.8E-06
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			2.2E-07
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			1.1E-06
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			2.3E-07
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			4.3E+00		Beryllium			4.3E+00			1.8E-07
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			2.5E-07
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			8.4E-08
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	4.6E-10				Total Rad + Chem	2.6E-10	*Total:* 7.1E-10	6.6E-06

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TABLE B.3.4-25
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.3E-03	3.5E+02		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.32E-03	2.0E+02		

0

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		4.1E-02
		6.5E-05
Total:		4.1E-02

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TABLE B.3.4-26
FUTURE, ON-PROPERTY FARMER (CT VALUES)
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	3.60E-01	3.8E+01	2.2E-10	8.3E-09	NP-237	3.27E-02	1.1E+01	2.2E-10	2.4E-09	1.1E-08
PU-238	2.02E-04	2.1E-02	2.2E-10	4.7E-12	PU-238	4.03E-05	1.3E-02	2.2E-10	2.9E-12	7.6E-12
PU-239/240	2.14E-05	2.3E-03	2.3E-10	5.2E-13	PU-239/240	4.29E-06	1.4E-03	2.3E-10	3.3E-13	8.5E-13
RA-226	4.38E-01	4.6E+01	7.8E-10	3.6E-08	RA-226	7.88E-01	2.6E+02	7.8E-10	2.0E-07	2.4E-07
RA-228	5.17E-01	5.4E+01	1.0E-10	5.4E-09	RA-228	9.36E-01	3.1E+02	1.0E-10	3.1E-08	3.6E-08
SR-90	3.58E+01	3.8E+03	3.6E-11	1.4E-07	SR-90	1.79E+02	5.9E+04	3.6E-11	2.1E-06	2.3E-06
TH-228	5.19E-03	5.5E-01	5.5E-11	3.0E-11	TH-228	4.40E-03	1.5E+00	5.5E-11	8.0E-11	1.1E-10
TH-230	2.1E-02	2.2E+00	1.30E-11	2.9E-11	TH-230	1.76E-02	5.8E+00	1.3E-11	7.6E-11	1.0E-10
TH-232	4.92E-03	5.2E-01	1.7E-10	8.8E-11	TH-232	4.10E-03	1.4E+00	1.7E-10	2.3E-10	3.2E-10
U-234	7.79E+00	8.2E+02	1.6E-11	1.3E-08	U-234	2.34E+01	7.8E+03	1.6E-11	1.2E-07	1.4E-07
U-235/236	5.25E-01	5.5E+01	1.6E-11	8.9E-10	U-235/236	1.58E+00	5.2E+02	1.6E-11	8.4E-09	9.3E-09
U-238	1.43E+01	1.5E+03	2.8E-11	4.2E-08	U-238	4.29E+01	1.4E+04	2.8E-11	4.0E-07	4.4E-07
			Total Pathway:	2.4E-07				Total Pathway:	2.9E-06	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	3.34E-02	2.0E-06	1.8E+00	3.4E-06	Arsenic	1.00E-03	1.9E-07	1.8E+00	3.2E-07	3.8E-06
Benzo(a)anthracene	6.38E-03	3.8E-07	7.3E-01	2.7E-07	Benzo(a)anthracene	2.03E-03	3.8E-07	7.3E-01	2.7E-07	5.5E-07
Benzo(a)pyrene	1.15E-02	6.7E-07	7.3E+00	4.9E-06	Benzo(a)pyrene	3.64E-03	6.7E-07	7.3E+00	4.9E-06	9.9E-06
Benzo(b)fluoranthene	2.47E-02	1.5E-06	7.3E-01	1.1E-06	Benzo(b)fluoranthene	7.84E-03	1.5E-06	7.3E-01	1.1E-06	2.1E-06
Benzo(g,h,i)perylene	1.33E-01	7.8E-06			Benzo(g,h,i)perylene	4.23E-02	7.8E-06			
Beryllium	6.98E-04	4.1E-08	4.3E+00	1.8E-07	Beryllium	6.29E-07	1.2E-10	4.3E+00	5.0E-10	1.8E-07
Lead	1.57E-02	9.2E-07			Lead	1.31E-02	2.4E-06			
Dibenzo(a,h)anthracene	2.47E-02	1.5E-06	7.3E+00	1.1E-05	Dibenzo(a,h)anthracene	7.84E-03	1.5E-06	7.3E+00	1.1E-05	2.1E-05
Indeno(1,2,3-cd)pyrene	3.66E-02	2.2E-06	7.3E-01	1.6E-06	Indeno(1,2,3-cd)pyrene	1.16E-02	2.2E-06	7.3E-01	1.6E-06	3.1E-06
TH-TOTAL	4.49E-05	2.6E-09			TH-TOTAL	3.74E-05	6.9E-09			
Phenanthrene	2.32E-03	1.4E-07			Phenanthrene	7.44E-04	1.4E-07			
			Total Pathway:	2.2E-05				Total Pathway:	1.9E-05	

Total Rad + Chem 2.2E-05

Total Rad + Chem 2.2E-05 *Total:* 4.4E-05

TABLE B.3.4-26
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	3.60E-01	3.8E+01		
PU-238	2.02E-04	2.1E-02		
PU-239/240	2.14E-05	2.3E-03		
RA-226	4.38E-01	4.6E+01		
RA-228	5.17E-01	5.4E+01		
SR-90	3.58E+01	3.8E+03		
TH-228	5.19E-03	5.5E-01		
TH-230	2.11E-02	2.2E+00		
TH-232	4.92E-03	5.2E-01		
U-234	7.79E+00	8.2E+02		
U-235/236	5.25E-01	5.5E+01		
U-238	1.43E+01	1.5E+03		

Total Pathway: 0.0E+00

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237	3.3E-02	1.1E+01		
PU-238	4.0E-05	1.3E-02		
PU-239/240	4.3E-06	1.4E-03		
RA-226	7.9E-01	2.6E+02		
RA-228	9.4E-01	3.1E+02		
SR-90	1.8E+02	5.9E+04		
TH-228	4.4E-03	1.5E+00		
TH-230	1.8E-02	5.8E+00		
TH-232	4.1E-03	1.4E+00		
U-234	2.3E+01	7.8E+03		
U-235/236	1.6E+00	5.2E+02		
U-238	4.3E+01	1.4E+04		

Total Pathway: 0.0E+00

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	3.34E-02	1.5E-05	3.0E-04	5.1E-02
Benzo(a)anthracene	6.38E-03	2.9E-06		
Benzo(a)pyrene	1.15E-02	5.2E-06		
Benzo(b)fluoranthene	2.47E-02	1.1E-05		
Benzo(g,h,i)perylene	1.33E-01	6.1E-05		
Beryllium	6.98E-04	3.2E-07	5.0E-03	6.4E-05
Lead	1.57E-02	7.2E-06		
Dibenzo(a,h)anthracene	2.47E-02	1.1E-05		
Indeno(1,2,3-cd)pyrene	3.66E-02	1.7E-05		
TH-TOTAL	4.49E-05	2.1E-08		
Phenanthrene	2.32E-03	1.1E-06		

Total Pathway: 5.1E-02

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.0E-03	1.4E-06	3.0E-04	4.8E-03
Benzo(a)anthracene	2.0E-03	2.9E-06		
Benzo(a)pyrene	3.6E-03	5.2E-06		
Benzo(b)fluoranthene	7.8E-03	1.1E-05		
Benzo(g,h,i)perylene	4.2E-02	6.1E-05		
Beryllium	6.3E-07	9.1E-10	5.0E-03	1.8E-07
Lead	1.3E-02	1.9E-05		
Dibenzo(a,h)anthracene	7.8E-03	1.1E-05		
Indeno(1,2,3-cd)pyrene	1.2E-02	1.7E-05		
TH-TOTAL	3.7E-05	5.4E-08		
Phenanthrene	7.4E-04	1.1E-06		

Total Pathway: 4.8E-03

Total Rad + Chem 5.1E-02

Total Rad + Chem 4.8E-03

Total

5.6E-02

6.4E-05

Total: 5.6E-02

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TABLE B.3.4-26
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
NP-237			2.2E-10		NP-237			2.2E-10			1.1E-08
PU-238			2.2E-10		PU-238			2.2E-10			7.6E-12
PU-239/240			2.3E-10		PU-239/240			2.3E-10			8.5E-13
RA-226			7.8E-10		RA-226			7.8E-10			2.4E-07
RA-228			1.0E-10		RA-228			1.0E-10			3.6E-08
SR-90			3.6E-11		SR-90			3.6E-11			2.3E-06
TH-228			5.5E-11		TH-228			5.5E-11			1.1E-10
TH-230			1.3E-11		TH-230			1.3E-11			1.0E-10
TH-232			1.7E-10		TH-232			1.7E-10			3.2E-10
U-234			1.6E-11		U-234			1.6E-11			1.4E-07
U-235/236			1.6E-11		U-235/236			1.6E-11			9.3E-09
U-238			2.8E-11		U-238			2.8E-11			4.4E-07
TC-99	2.55E+00	2.7E+02	1.3E-12	3.5E-10	TC-99	3.07E+00	1.0E+03	1.3E-12	1.3E-09	1.7E-09	1.7E-09
			Total Pathway:	3.5E-10				Total Pathway:	1.3E-09		

Chemical Risk

Ingestion of Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			3.8E-06
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			5.5E-07
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			9.9E-06
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			2.1E-06
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Beryllium			4.3E+00		Beryllium			4.3E+00			1.8E-07
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			2.1E-05
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			3.1E-06
TH-TOTAL					TH-TOTAL						
Phenanthrene					Phenanthrene						
			Total Pathway:					Total Pathway:			

Total Rad + Chem 3.5E-10 Total Rad + Chem 1.3E-09 *Total:* 1.7E-09 4.4E-05

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TABLE B.3.4-26
(continued)
SOLID WASTE LANDFILL: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	2.55E+00	2.7E+02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	3.1E+00	1.0E+03		

Total Pathway:

Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion of Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL				
Phenanthrene				

Total Pathway:

	Total	Total Dust & Groundwater Affected
		5.6E-02
		6.4E-05

Total Rad + Chem

Total Rad + Chem

Total:	5.6E-02

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TABLE B.3.4-27
FUTURE, ON-SUBUNIT HOMEBUILDER
SOLID WASTE LANDFILL: SUBSURFACE/SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation/Surface Soil

Compound	Conc'n (pCi/m3)	Intake	SF(i)	Risk
CS-137			1.9E-11	
NP-237	3.57E-06	5.99E-03	2.9E-08	1.7E-10
PB-210			4.0E-09	
PU-238	2.32E-06	3.89E-03	3.9E-08	1.5E-10
PU-239/240	2.46E-07	4.13E-04	3.8E-08	1.6E-11
RA-224			1.2E-09	
RA-226	4.27E-06	7.17E-03	7.0E-09	5.0E-11
RA-228	5.04E-06	8.46E-03	6.9E-10	5.8E-12
SR-90	2.87E-06	4.82E-03	6.2E-11	3.0E-13
TC-99			8.3E-12	
TH-228	4.88E-06	8.19E-03	7.8E-08	6.4E-10
TH-230	1.94E-05	3.26E-02	2.9E-08	9.4E-10
TH-232	4.53E-06	7.60E-03	1.1E-07	8.4E-10
U-234	1.26E-04	2.11E-01	2.6E-08	5.5E-09
U-235			2.5E-08	
U-235/236	8.51E-06	1.43E-02	2.5E-08	3.6E-10
U-238	2.31E-04	3.88E-01	5.2E-08	2.0E-08
			Total Pathway:	2.9E-08

Ingestion/Subsurface Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	2.50E-01	1.0E+01	2.8E-11	2.8E-10
NP-237	3.51E-01	1.4E+01	2.2E-10	3.1E-09
PB-210	1.03E+00	4.1E+01	6.6E-10	2.7E-08
PU-238	3.28E-01	1.3E+01	2.2E-10	2.9E-09
PU-239/240	6.80E-01	2.7E+01	2.3E-10	6.3E-09
RA-224	2.14E+00	8.6E+01	3.8E-11	3.3E-09
RA-226	1.55E+00	6.2E+01	7.8E-10	4.9E-08
RA-228	2.56E+00	1.0E+02	1.0E-10	1.0E-08
SR-90	1.58E+00	6.4E+01	3.6E-11	2.3E-09
TC-99	7.54E-01	3.0E+01	1.3E-12	3.9E-11
TH-228	3.39E+00	1.4E+02	5.5E-11	7.5E-09
TH-230	1.23E+01	5.0E+02	1.3E-11	6.4E-09
TH-232	3.59E+00	1.4E+02	1.7E-10	2.5E-08
U-234	9.70E+01	3.9E+03	1.6E-11	6.3E-08
U-235	1.89E+00	7.6E+01	1.6E-11	1.2E-09
U-235/236	8.04E+00	3.2E+02	1.6E-11	5.2E-09
U-238	1.70E+02	6.8E+03	2.8E-11	1.9E-07
			Total Pathway:	4.0E-07

Chemical Risk

Inhalation/Surface Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Antimony				
Arsenic	2.00E-08	1.88E-11	1.5E+01	2.8E-10
Beryllium	2.09E-09	1.96E-12	8.4E+00	1.6E-11
Lead	5.70E-08	5.35E-11		
2-Methylnaphthalene				
Benzo(a)anthracene	1.12E-09	1.05E-12		
Benzo(a)pyrene	1.02E-09	9.57E-13		
Benzo(b)fluoranthene	2.13E-09	2.00E-12		
Benzo(g,h,i)perylene	1.53E-09	1.44E-12		
Carbazole				
Dibenzo(a,h)anthracene	6.00E-10	5.63E-13		
Indeno(1,2,3-cd)pyrene	1.44E-09	1.35E-12		
Phenanthrene	1.62E-09	1.52E-12		
1,4-Dioxane				
Heptachlorodibenzo-p-dioxin			1.5E+03	
Heptachlorodibenzofuran			1.5E+03	
Octachlorodibenzo-p-dioxin			1.5E+02	
Aroclor-1254				
Aroclor-1260				
TH-TOTAL	4.21E-08	3.95E-11		
			Total Pathway:	3.0E-10
			Total Rad + Chem	2.9E-08

Ingestion/Subsurface Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Antimony	2.20E+01	5.0E-07		
Arsenic	1.38E+01	3.1E-07	1.8E+00	5.4E-07
Beryllium	1.08E+00	2.4E-08	4.3E+00	1.0E-07
Lead	2.83E+01	6.4E-07		
2-Methylnaphthalene	1.00E-01	2.3E-09		
Benzo(a)anthracene	7.50E+00	1.7E-07	7.3E-01	1.2E-07
Benzo(a)pyrene	8.20E+00	1.8E-07	7.3E+00	1.3E-06
Benzo(b)fluoranthene	1.50E+00	3.4E-08	7.3E-01	2.5E-08
Benzo(g,h,i)perylene	4.90E-01	1.1E-08		
Carbazole	4.20E+00	9.5E-08	2.0E-02	1.9E-09
Dibenzo(a,h)anthracene	2.50E-01	5.6E-09	7.3E+00	4.1E-08
Indeno(1,2,3-cd)pyrene	5.50E+00	1.2E-07	7.3E-01	9.0E-08
Phenanthrene	4.80E+00	1.1E-07		
1,4-Dioxane	1.29E+01	2.9E-07		
Heptachlorodibenzo-p-dioxin	9.00E-04	2.0E-11	1.5E+03	3.0E-08
Heptachlorodibenzofuran	2.50E-04	5.6E-12	1.5E+03	8.4E-09
Octachlorodibenzo-p-dioxin	1.37E-02	3.1E-10	1.5E+02	4.6E-08
Aroclor-1254	4.80E-02	1.1E-09	7.7E+00	8.3E-09
Aroclor-1260	7.70E-02	1.7E-09	7.7E+00	1.3E-08
TH-TOTAL	3.24E+01	7.3E-07		
			Total Pathway:	2.4E-06
			Total Rad + Chem	2.8E-06

TABLE B.3.4-27
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Subsurface Soil				External Radiation/Subsurface Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable				CS-137	1.4E-02	2.0E-06	2.9E-08	2.9E-08
				NP-237	2.0E-02	4.3E-07	8.7E-09	1.2E-08
				PB-210	5.9E-02	1.6E-10	9.5E-12	2.7E-08
				PU-238	1.9E-02	2.8E-11	5.3E-13	3.1E-09
				PU-239/240	3.9E-02	2.7E-11	1.1E-12	6.3E-09
				RA-224	1.2E-01	2.3E-08	2.8E-09	6.1E-09
				RA-226	8.9E-02	6.0E-06	5.3E-07	5.8E-07
				RA-228	1.5E-01	2.9E-06	4.3E-07	4.4E-07
				SR-90	9.1E-02			2.3E-09
				TC-99	4.3E-02	6.0E-13	2.6E-14	4.0E-11
				TH-228	1.9E-01	5.6E-06	1.1E-06	1.1E-06
				TH-230	7.1E-01	5.4E-11	3.8E-11	7.4E-09
				TH-232	2.1E-01	8.5E-06	1.8E-06	1.8E-06
				U-234	5.6E+00	3.0E-11	1.7E-10	6.8E-08
				U-235	1.1E-01	2.4E-07	2.6E-08	2.7E-08
				U-235/236	4.6E-01	2.4E-07	1.1E-07	1.2E-07
				U-238	9.8E+00	3.6E-08	3.5E-07	5.6E-07
Total Pathway:				Total Pathway:			4.3E-06	

Chemical Risk

Dermal Contact/Subsurface Soil				External Radiation/Subsurface Soil				Total
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(o)	Risk	
Antimony	5.9E-08							
Arsenic	3.7E-09	1.8E+00	6.9E-09					5.5E-07
Beryllium	2.9E-09		1.0E-07	Not applicable				2.1E-07
Lead	7.6E-08							
2-Methylnaphthalene	8.1E-09							
Benzo(a)anthracene			1.2E-07					2.5E-07
Benzo(a)pyrene			1.3E-06					2.7E-06
Benzo(b)fluoranthene			2.5E-08					4.9E-08
Benzo(g,h,i)perylene	4.0E-08							
Carbazole		2.2E-02						1.9E-09
Dibenzo(a,h)anthracene			4.1E-08					8.2E-08
Indeno(1,2,3-cd)pyrene			9.0E-08					1.8E-07
Phenanthrene	3.9E-07							
1,4-Dioxane								
Heptachlorodibenzo-p-dioxin	7.3E-12	3.0E+03	2.2E-08					5.2E-08
Heptachlorodibenzofuran	2.0E-12	3.0E+03	6.1E-09					1.5E-08
Octachlorodibenzo-p-dioxin	1.1E-10	3.0E+02	3.3E-08					8.0E-08
Aroclor-1254	7.8E-10	1.0E+01	8.0E-09					1.6E-08
Aroclor-1260	1.2E-09	1.0E+01	1.3E-08					2.6E-08
TH-TOTAL	8.7E-08							
	Total Pathway:		1.8E-06	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.8E-06 4.3E-06 *Total:* 9.0E-06

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TABLE B.3.4-27
(continued)

Non-carcinogenic Hazard

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.63E-05	2.73E-02		
NP-237	2.28E-05	3.83E-02		
PB-210	6.70E-05	1.12E-01		
PU-238	2.13E-05	3.58E-02		
PU-239/240	4.42E-05	7.42E-02		
RA-224	1.39E-04	2.33E-01		
RA-226	1.01E-04	1.69E-01		
RA-228	1.66E-04	2.79E-01		
SR-90	1.03E-04	1.72E-01		
TC-99	4.90E-05	8.22E-02		
TH-228	2.20E-04	3.70E-01		
TH-230	8.00E-04	1.34E+00		
TH-232	2.33E-04	3.92E-01		
U-234	6.31E-03	1.06E+01		
U-235	1.23E-04	2.06E-01		
U-235/236	5.23E-04	8.77E-01		
U-238	1.11E-02	1.85E+01		

Total Pathway:

Ingestion/Subsurface Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	0.25	1.0E+01		
NP-237	0.35	1.4E+01		
PB-210	1.03	4.1E+01		
PU-238	0.33	1.3E+01		
PU-239/240	0.68	2.7E+01		
RA-224	2.14	8.6E+01		
RA-226	1.55	6.2E+01		
RA-228	2.56	1.0E+02		
SR-90	1.58	6.4E+01		
TC-99	0.75	3.0E+01		
TH-228	3.39	1.4E+02		
TH-230	12.30	5.0E+02		
TH-232	3.59	1.4E+02		
U-234	97.00	3.9E+03		
U-235	1.89	7.6E+01		
U-235/236	8.04	3.2E+02		
U-238	170.00	6.8E+03		

Total Pathway:

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Antimony	1.43E-06	1.96E-07		
Arsenic	8.97E-07	1.23E-07		
Beryllium	6.99E-08	9.57E-09		
Lead	1.84E-06	2.52E-07		
2-Methylnaphthalene	6.50E-09	8.90E-10		
Benzo(a)anthracene	4.88E-07	6.68E-08		
Benzo(a)pyrene	5.33E-07	7.30E-08		
Benzo(b)fluoranthene	9.75E-08	1.34E-08		
Benzo(g,h,i)perylene	3.19E-08	4.36E-09		
Carbazole	2.73E-07	3.74E-08		
Dibenzo(a,h)anthracene	1.63E-08	2.23E-09		
Indeno(1,2,3-cd)pyrene	3.58E-07	4.90E-08		
Phenanthrene	3.12E-07	4.27E-08		
1,4-Dioxane	8.39E-07	1.15E-07		
Heptachlorodibenzo-p-dioxin	5.85E-11	8.01E-12		
Heptachlorodibenzofuran	1.63E-11	2.23E-12		
Octachlorodibenzo-p-dioxin	8.91E-10	1.22E-10		
Aroclor-1254	3.12E-09	4.27E-10		
Aroclor-1260	5.01E-09	6.86E-10		
TH-TOTAL	2.11E-06	2.88E-07		

Total Pathway:

Ingestion/Subsurface Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Antimony	2.2E+01	7.2E-05	4.0E-04	1.8E-01
Arsenic	1.4E+01	4.5E-05	3.0E-04	1.5E-01
Beryllium	1.1E+00	3.5E-06	5.0E-03	7.1E-04
Lead	2.8E+01	9.3E-05		
2-Methylnaphthalene	0.10	3.3E-07		
Benzo(a)anthracene	7.50	2.5E-05		
Benzo(a)pyrene	8.20	2.7E-05		
Benzo(b)fluoranthene	1.50	4.9E-06		
Benzo(g,h,i)perylene	0.49	1.6E-06		
Carbazole	4.20	1.4E-05		
Dibenzo(a,h)anthracene	0.25	8.2E-07		
Indeno(1,2,3-cd)pyrene	5.50	1.8E-05		
Phenanthrene	5	1.6E-05		
1,4-Dioxane	1.3E+01	4.2E-05		
Heptachlorodibenzo-p-dioxin	0.00	3.0E-09		
Heptachlorodibenzofuran	0.00	8.2E-10		
Octachlorodibenzo-p-dioxin	1.4E-02	4.5E-08		
Aroclor-1254	4.8E-02	1.6E-07		
Aroclor-1260	0.08	2.5E-07		
TH-TOTAL	32.40	1.1E-04		

Total Pathway: 3.3E-01

Total Rad + Chem

Total Rad + Chem 3.3E-01

TABLE B.3.4-27
(continued)

Non-carcinogenic Hazard

Radiation Risk

Dermal Contact/Subsurface Soil	External Radiation/Subsurface Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	1.4E-02		
	NP-237	2.0E-02		
	PB-210	5.9E-02		
	PU-238	1.9E-02		
	PU-239/240	3.9E-02		
	RA-224	1.2E-01		
	RA-226	8.9E-02		
	RA-228	1.5E-01		
	SR-90	9.1E-02		
	TC-99	4.3E-02		
	TH-228	1.9E-01		
	TH-230	7.1E-01		
	TH-232	2.1E-01		
	U-234	5.6E+00		
	U-235	1.1E-01		
	U-235/236	4.6E-01		
	U-238	9.8E+00		
Total Pathway:	Total Pathway:			

Chemical Risk

Dermal Contact/Subsurface Soil				External Radiation/Subsurface Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Antimony	8.7E-06	6.0E-05	1.4E-01					3.3E-01
Arsenic	5.4E-07	2.9E-04	1.9E-03					1.5E-01
Beryllium	4.2E-07		1.4E-03	Not applicable				2.1E-03
Lead	1.1E-05							
2-Methylnaphthalene	1.2E-06							
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	5.8E-06							
Carbazole								
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
Phenanthrene	5.7E-05							
1,4-Dioxane								
Heptachlorodibenzo-p-dioxin	1.1E-09							
Heptachlorodibenzofuran	3.0E-10							
Octachlorodibenzo-p-dioxin	1.6E-08							
Aroclor-1254	1.1E-07							
Aroclor-1260	1.8E-07							
TH-TOTAL	1.3E-05							
		Total Pathway:	1.5E-01					
				Total Pathway:				

Total Rad + Chem 1.5E-01

Total: 4.8E-01

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TABLE B.3.4-28
FUTURE, PERCHED GROUNDWATER USER (ADULT)
SOLID WASTE LANDFILL: PERCHED GROUNDWATER
Carcinogenic Risk

Radiation Risk					
Ingestion/Groundwater					Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
TC-99	2.9E+01	1.4E+06	1.3E-12	1.8E-06	1.8E-06
			Total Pathway:	1.8E-06	

Chemical Risk					
Ingestion/Groundwater					
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	
Carbazole	9.6E-03	2.6E-04	2.0E-02	5.3E-06	5.3E-06
			Total Pathway:	5.3E-06	

Total Rad + Chem	7.1E-06	*Total:*	7.1E-06

TABLE B.3.4-29(a)
FUTURE, GREAT MIAMI RIVER RECREATIONAL USER, ADULT
SOLID WASTE LANDFILL: SURFACE WATER

Carcinogenic Risk

Radiation Risk

Ingestion of Surface Water

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237	1.5E-06	4.1E-05	2.2E-10	9.0E-15
RA-226	1.4E-07	3.8E-06	7.8E-10	3.0E-15
RA-228	1.7E-07	4.6E-06	1.0E-10	4.6E-16
SR-90	6.6E-06	1.8E-04	3.6E-11	6.4E-15
U-234	3.9E-04	1.1E-02	1.6E-11	1.7E-13
U-235/236	2.6E-06	7.1E-05	1.6E-11	1.1E-15
U-238	7.1E-05	1.9E-03	2.8E-11	5.4E-14
		Total Pathway:		2.4E-13

Dermal Contact/Surface Water

Not Applicable

Total Pathway:

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
NP-237	1.50E-08	3.0E-03	2.2E-10	6.5E-13
RA-226	6.95E-09	1.4E-03	7.8E-10	1.1E-12
RA-228	8.35E-09	1.7E-03	1.0E-10	1.7E-13
SR-90	1.97E-07	3.9E-02	3.6E-11	1.4E-12
U-234	7.76E-07	1.5E-01	1.6E-11	2.5E-12
U-235/236	5.22E-09	1.0E-03	1.6E-11	1.7E-14
U-238	1.42E-07	2.8E-02	2.8E-11	7.9E-13

Total

6.6E-13
1.1E-12
1.7E-13
1.4E-12
2.6E-12
1.8E-14
8.4E-13

Chemical Risk

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic	2.3E-09	3.5E-14	1.8E+00	6.2E-14
Benzo(a)anthracene	9.6E-12	1.5E-16	7.3E-01	1.1E-16
Benzo(a)pyrene	3.8E-12	5.7E-17	7.3E+00	4.2E-16
Benzo(g,h,i)perylene	1.6E-12	2.5E-17		
Beryllium	3.7E-11	5.7E-16	4.3E+00	2.4E-15
Lead	4.4E-10	6.7E-15		
U-Total	2.1E-07	3.2E-12		
Dibenzo(a,h)anthracene	2.3E-12	3.4E-17	7.3E+00	2.5E-16
Phenanthrene	1.6E-07	2.4E-12		
		Total Pathway		6.5E-14

Dermal Contact/Surface Water

Compound	Intake	SF(derm)	Risk
Arsenic	1.6E-14	1.8E+00	3.0E-14
Benzo(a)anthracene			1.1E-16
Benzo(a)pyrene			4.2E-16
Benzo(g,h,i)perylene			
Beryllium	2.6E-16		2.4E-15
Lead	1.2E-17		
U-Total	1.5E-12		
Dibenzo(a,h)anthracene			2.5E-16
Phenanthrene			
		Total Pathway	3.3E-14

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	SF(o)	Risk
Arsenic	1.02E-07	1.1E-11	1.8E+00	2.0E-11
Benzo(a)anthracene	1.14E-07	1.3E-11	7.3E-01	9.2E-12
Benzo(a)pyrene	9.56E-08	1.1E-11	7.3E+00	7.7E-11
Benzo(g,h,i)perylene	2.98E-07	3.3E-11		
Beryllium	7.07E-10	7.8E-14	4.3E+00	3.4E-13
Lead	2.15E-08	2.4E-12		
U-Total	4.14E-10	4.6E-14		
Dibenzo(a,h)anthrace	2.09E-07	2.3E-11	7.3E+00	1.7E-10
Phenanthrene	2.75E-04	3.0E-08		

Total

2.0E-11
9.2E-12
7.7E-11
3.4E-13
1.7E-10

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total: 2.8E-10

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TABLE B.3.4-29(a) (continued)

Noncarcinogenic Hazard

Radiation Hazard

Ingestion of Surface Water

Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	1.50E-06			
RA-226	1.39E-07			
RA-228	1.67E-07			
SR-90	6.55E-06			
U-234	3.88E-04			
U-235/236	2.61E-06			
U-238	7.12E-05			

Dermal Contact/Surface Water

Not Applicable

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.50E-08			
RA-226	6.95E-09			
RA-228	8.35E-09			
SR-90	1.97E-07			
U-234	7.76E-07			
U-235/236	5.22E-09			
U-238	1.42E-07			

Total Pathway:

Chemical Hazard

Ingestion of Surface Water

Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	2.31E-09	8.2E-14	3.0E-04	2.7E-10
Benzo(a)anthracene	9.63E-12	3.4E-16		
Benzo(a)pyrene	3.75E-12	1.3E-16		
Benzo(g,h,i)perylene	1.62E-12	5.8E-17		
Beryllium	3.72E-11	1.3E-15	5.0E-03	2.6E-13
Lead	4.38E-10	1.6E-14		
U-Total	2.07E-07	7.4E-12	3.0E-03	2.5E-09
Dibenzo(a,h)anthracene	2.25E-12	8.0E-17		
Phenanthrene	1.57E-07	5.6E-12		

Total Pathway: 2.7E-09

Dermal Contact/Surface Water

Compound	Intake	RfD(derm	Hazard
Arsenic	3.8E-14	2.9E-04	1.3E-10
Benzo(a)anthracene	1.3E-13		
Benzo(a)pyrene	7.4E-14		
Benzo(g,h,i)perylene	1.4E-13		
Beryllium	6.1E-16	5.0E-05	1.2E-11
Lead	2.9E-17		
U-Total	3.4E-12	1.5E-04	2.3E-08
Dibenzo(a,h)anthracene	1.0E-13		
Phenanthrene	5.9E-10		

Total Pathway: 2.3E-08

Ingestion of Fish

Compound	Conc'n-Fish (pCi/kg)	Intake	RfD(o)	Hazard
Arsenic	1.02E-07	2.6E-11	3.0E-04	8.7E-08
Benzo(a)anthracene	1.14E-07	2.9E-11		
Benzo(a)pyrene	9.56E-08	2.5E-11		
Benzo(g,h,i)perylene	2.98E-07	7.7E-11		
Beryllium	7.07E-10	1.8E-13	5.0E-03	3.6E-11
Lead	2.15E-08	5.5E-12		
U-Total	4.14E-10	1.1E-13	3.0E-03	3.6E-11
Dibenzo(a,h)anthrace	2.09E-07	5.4E-11		
Phenanthrene	2.75E-04	7.1E-08		

Total
8.8E-08
4.9E-11
2.5E-08

Total: 1.1E-07

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TABLE B.3.4-29(b)

CURRENT/FUTURE GREAT MIAMI RIVER AGRICULTURAL USER

SOLID WASTE LANDFILL: BEEF AND MILK (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237	5.27E-05	9.8E+01	2.2E-10	2.2E-08	NP-237	4.79E-06	3.5E-02	2.2E-10	7.8E-12	2.2E-08
RA-226	2.76E-05	5.1E+01	7.8E-10	4.0E-08	RA-226	4.97E-05	3.7E-01	7.8E-10	2.8E-10	4.0E-08
RA-228	6.02E-07	1.1E+00	1E-10	1.1E-10	RA-228	1.08E-06	8.0E-03	1.0E-10	8.0E-13	1.1E-10
SR-90	4.62E-03	8.6E+03	3.6E-11	3.1E-07	SR-90	2.31E-02	1.7E+02	3.6E-11	6.1E-09	3.1E-07
U-234	5.77E-03	1.1E+04	1.6E-11	1.7E-07	U-234	1.73E-02	1.3E+02	1.6E-11	2.0E-09	1.7E-07
U-235/236	3.88E-05	7.2E+01	1.6E-11	1.2E-09	U-235/236	1.16E-04	8.6E-01	1.6E-11	1.4E-11	1.2E-09
U-238	1.06E-03	2.0E+03	2.8E-11	5.5E-08	U-238	3.17E-03	2.3E+01	2.8E-11	6.5E-10	5.6E-08
			Total Pathway:	6.0E-07				Total Pathway:	9.1E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	4.26E-06	4.4E-09	1.8E+00	7.7E-09	Arsenic	1.28E-07	5.3E-10	1.8E+00	9.2E-10	8.7E-09
Benzo(a)anthracene	3.05E-09	3.2E-12	7.3E-01	2.3E-12	Benzo(a)anthracene	9.64E-10	4.0E-12	7.3E-01	2.9E-12	5.2E-12
Benzo(a)pyrene	1.84E-09	1.9E-12	7.3E+00	1.4E-11	Benzo(a)pyrene	5.82E-10	2.4E-12	7.3E+00	1.7E-11	3.1E-11
Benzo(g,h,i)perylene	2.32E-09	2.4E-12			Benzo(g,h,i)perylene	7.36E-10	3.0E-12			
Beryllium	3.05E-08	3.2E-11	4.3E+00	1.4E-10	Beryllium	2.74E-11	1.1E-13	4.3E+00	4.9E-13	1.4E-10
Lead	5.93E-07	6.2E-10			Lead	4.94E-07	2.0E-09			
U-Total	3.08E-06	3.2E-09			U-Total	9.23E-06	3.8E-08			
Dibenzo(a,h)anthracene	3.09E-09	3.2E-12	7.3E+00	2.3E-11	Dibenzo(a,h)anthracene	9.78E-10	4.0E-12	7.3E+00	2.9E-11	5.3E-11
Phenanthrene	3.41E-06	3.5E-09			Phenanthrene	1.08E-06	4.4E-09			
			Total Pathway:	7.9E-09				Total Pathway:	9.7E-10	

Total Rad + Chem 6.1E-07

Total Rad + Chem 1.0E-08 *Total:* 6.2E-07

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TABLE B.3.4-29(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	5.3E-05	9.8E+01		
RA-226	2.8E-05	5.1E+01		
RA-228	6.0E-07	1.1E+00		
SR-90	4.6E-03	8.6E+03		
U-234	5.8E-03	1.1E+04		
U-235/236	3.9E-05	7.2E+01		
U-238	1.1E-03	2.0E+03		

Total Pathway:

Ingestion/Milk

Compound	Intake	RfD(o)	Risk
NP-237	3.5E-02		
RA-226	3.7E-01		
RA-228	8.0E-03		
SR-90	1.7E+02		
U-234	1.3E+02		
U-235/236	8.6E-01		
U-238	2.3E+01		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	4.3E-06	4.4E-09	3.0E-04	1.5E-05
Benzo(a)anthracene	3.0E-09	3.2E-12		
Benzo(a)pyrene	1.8E-09	1.9E-12		
Benzo(g,h,i)perylene	2.3E-09	2.4E-12		
Beryllium	3.0E-08	3.2E-11	5.0E-03	6.3E-09
Lead	5.9E-07	6.2E-10		
U-Total	3.1E-06	3.2E-09	3.0E-03	1.1E-06
Dibenzo(a,h)anthracene	3.1E-09	3.2E-12		
Phenanthrene	3.4E-06	3.5E-09		

Total Pathway: 1.6E-05

Ingestion/Milk

Compound	Intake	RfD(o)	Risk
Arsenic	5.3E-10	3.0E-04	1.8E-06
Benzo(a)anthracene	4.0E-12		
Benzo(a)pyrene	2.4E-12		
Benzo(g,h,i)perylene	3.0E-12		
Beryllium	1.1E-13	5.0E-03	2.3E-11
Lead	2.0E-09		
U-Total	3.8E-08	3.0E-03	1.3E-05
Dibenzo(a,h)anthracene	4.0E-12		
Phenanthrene	4.4E-09		

Total Pathway: 1.4E-05

Total Rad + Chem	1.6E-05	Total Rad + Chem	1.4E-05

Total

	1.6E-05
	6.4E-09
	1.4E-05

Total: 3.0E-05

TABLE B.3.4-29(c)

FUTURE, GREAT MIAMI RIVER RESIDENTIAL USER, ADULT

SOLID WASTE LANDFILL: GREAT MIAMI RIVER SURFACE WATER

Carcinogenic Risk

Radiation Risk

Inhalation of Surface Water					Ingestion of Surface Water				Dermal Contact/Surface Water				Total
Compound	Conc'n (pCi/L)	Intake	SF(i)	Risk	Compound	Intake	SF(o)	Risk					
					NP-237	7.4E-02	2.2E-10	1.6E-11					1.6E-11
					RA-226	6.8E-03	7.8E-10	5.3E-12					5.3E-12
					RA-228	8.2E-03	1.0E-10	8.2E-13					8.2E-13
Not applicable					SR-90	3.2E-01	3.6E-11	1.2E-11	Not Applicable				1.2E-11
					U-234	1.9E+01	1.6E-11	3.0E-10					3.0E-10
					U-235/236	1.3E-01	1.6E-11	2.0E-12					2.0E-12
					U-238	3.5E+00	2.8E-11	9.8E-11					9.8E-11
Total Pathw					Total Pathway			4.4E-10	Total Pathway				

Chemical Risk

Inhalation of Surface Water					Ingestion of Surface Water				Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(i)	Risk	Compound	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	2.3E-09	2.4E-10	1.5E+01	3.6E-09	Arsenic	6.3E-11	1.8E+00	1.1E-10	Arsenic	1.8E-13	1.8E+00	3.4E-13	3.7E-09
Benzo(a)anthracene	9.6E-12	9.9E-13	6.1E-01	6.0E-13	Benzo(a)anthracene	2.6E-13	7.3E-01	1.9E-13	Benzo(a)anthracene			1.9E-13	9.9E-13
Benzo(a)pyrene	3.8E-12	3.9E-13	6.1E+00	2.4E-12	Benzo(a)pyrene	1.0E-13	7.3E+00	7.5E-13	Benzo(a)pyrene			7.5E-13	3.9E-12
Benzo(g,h,i)perylene	1.6E-12	1.7E-13			Benzo(g,h,i)perylene	4.4E-14			Benzo(g,h,i)perylene				
Beryllium	3.7E-11	3.8E-12	8.4E+00	3.2E-11	Beryllium	1.0E-12	4.3E+00	4.4E-12	Beryllium	2.9E-15		4.4E-12	4.1E-11
Lead	4.4E-10	4.5E-11			Lead	1.2E-11			Lead	1.4E-16			
U-Total	2.1E-07	2.1E-08			U-Total	5.7E-09			U-Total	1.6E-11			
Dibenzo(a,h)anthracene	2.3E-12	2.3E-13	6.1E+00	1.4E-12	Dibenzo(a,h)anthracene	6.2E-14	7.3E+00	4.5E-13	Dibenzo(a,h)anthracene			4.5E-13	2.3E-12
Phenanthrene	1.6E-07	1.6E-08			Phenanthrene	4.3E-09			Phenanthrene				
		Total Pathway		3.6E-09		Total Pathway		1.2E-10		Total Pathway		6.1E-12	

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

		Total Rad + Chem		3.6E-09		Total Rad + Chem		5.5E-10		Total Rad + Chem		6.1E-12	**Total:** 4.2E-09

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TABLE B.3.4-29(c)
(continued)

Noncarcinogenic Hazard

Radiation Hazard

Inhalation of Surface Water					Ingestion of Surface Water				Dermal Contact/Surface Water				Total
Compound	Conc'n (pCi/L)	Intake	RfD(i)	Hazard	Compound	Intake	RfD(o)	Hazard					
Not applicable					NP-237				Not Applicable				
					RA-226								
					RA-228								
					SR-90								
					U-234								
					U-235/236								
					U-238								
Total Pathw					Total Pathway								

Chemical Hazard

Inhalation of Surface Water					Ingestion of Surface Water				Dermal Contact/Surface Water				Total
Compound	Conc'n (mg/L)	Intake	RfD(i)	Hazard	Compound	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Arsenic	2.3E-09	2.4E-10			Arsenic	6.3E-11	3.0E-04	2.1E-07	Arsenic	1.8E-13	2.9E-04	6.4E-10	2.1E-07
Benzo(a)anthracene	9.6E-12	9.9E-13			Benzo(a)anthracene	2.6E-13			Benzo(a)anthracene	6.1E-13			
Benzo(a)pyrene	3.8E-12	3.9E-13			Benzo(a)pyrene	1.0E-13			Benzo(a)pyrene	3.5E-13			
Benzo(g,h,i)perylene	1.6E-12	1.7E-13			Benzo(g,h,i)perylene	4.4E-14			Benzo(g,h,i)perylene	6.9E-13			
Beryllium	3.7E-11	3.8E-12			Beryllium	1.0E-12	5.0E-03	2.0E-10	Beryllium	2.9E-15	5.0E-05	5.9E-11	2.6E-10
Lead	4.4E-10	4.5E-11			Lead	1.2E-11			Lead	1.4E-16			
U-Total	2.1E-07	2.1E-08			U-Total	5.7E-09	3.0E-03	1.9E-06	U-Total	1.6E-11	1.5E-04	1.1E-07	2.0E-06
Dibenzo(a,h)anthracene	2.3E-12	2.3E-13			Dibenzo(a,h)anthracene	6.2E-14			Dibenzo(a,h)anthracene	4.8E-13			
Phenanthrene	1.6E-07	1.6E-08			Phenanthrene	4.3E-09			Phenanthrene	2.8E-09			
Total Pathway					Total Pathway			2.1E-06	Total Pathway:			1.1E-07	
Total Rad + Chem					Total Rad + Chem			2.1E-06	Total Rad + Chem			1.1E-07	**Total:** 2.2E-06

TABLE B.3.4-29(d)

CURRENT/FUTURE GREAT MIAMI AGRICULTURAL USER

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (GREAT MIAMI RIVER SURFACE WATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237	1.65E-06	3.2E+00	2.2E-10	7.1E-10	NP-237	1.65E-06	1.7E+00	2.2E-10	3.8E-10	1.1E-09
RA-226	1.90E-07	3.7E-01	7.8E-10	2.9E-10	RA-226	1.90E-07	2.0E-01	7.8E-10	1.5E-10	4.5E-10
RA-228	4.98E-09	9.8E-03	1.0E-10	9.8E-13	RA-228	4.93E-09	5.1E-03	1.0E-10	5.1E-13	1.5E-12
SR-90	2.65E-05	5.2E+01	3.6E-11	1.9E-09	SR-90	2.65E-05	2.8E+01	3.6E-11	9.9E-10	2.9E-09
U-234	2.33E-04	4.6E+02	1.6E-11	7.4E-09	U-234	2.33E-04	2.4E+02	1.6E-11	3.9E-09	1.1E-08
U-235/236	1.57E-06	3.1E+00	1.6E-11	4.9E-11	U-235/236	1.57E-06	1.6E+00	1.6E-11	2.6E-11	7.6E-11
U-238	4.28E-05	8.4E+01	2.8E-11	2.4E-09	U-238	4.28E-05	4.5E+01	2.8E-11	1.3E-09	3.6E-09
			Total Pathway:	1.3E-08				Total Pathway:	6.7E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	5.48E-06	6.0E-09	1.8E+00	1.1E-08	Arsenic	5.48E-06	3.2E-09	1.8E+00	5.6E-09	1.6E-08
Benzo(a)anthracene	4.64E-09	5.1E-12	7.3E-01	3.7E-12	Benzo(a)anthracene	4.61E-09	2.7E-12	7.3E-01	2.0E-12	5.7E-12
Benzo(a)pyrene	1.02E-09	1.1E-12	7.3E+00	8.2E-12	Benzo(a)pyrene	1.01E-09	5.9E-13	7.3E+00	4.3E-12	1.2E-11
Benzo(g,h,i)perylene	9.51E-11	1.0E-13			Benzo(g,h,i)perylen	9.44E-11	5.5E-14			
Beryllium	7.85E-08	8.6E-11	4.3E+00	3.7E-10	Beryllium	7.85E-08	4.6E-11	4.3E+00	2.0E-10	5.7E-10
Lead	6.77E-06	7.5E-09			Lead	6.77E-06	3.9E-09			
U-Total	1.24E-04	1.4E-07			U-Total	1.24E-04	7.3E-08			
Dibenzo(a,h)anthrace	3.09E-10	3.4E-13	7.3E+00	2.5E-12	Dibenzo(a,h)anthracen	3.07E-10	1.8E-13	7.3E+00	1.3E-12	3.8E-12
Phenanthrene	6.75E-05	7.4E-08			Phenanthrene	6.58E-05				
			Total Pathway:	1.1E-08				Total Pathway:	5.8E-09	
			Total Rad + Chem	2.4E-08				Total Rad + Chem	1.3E-08	*Total:* 3.6E-08

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TABLE B.3.4-29(d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.6E-06	3.2E+00		
RA-226	1.9E-07	3.7E-01		
RA-228	5.0E-09	9.8E-03		
SR-90	2.7E-05	5.2E+01		
U-234	2.3E-04	4.6E+02		
U-235/236	1.6E-06	3.1E+00		
U-238	4.3E-05	8.4E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237	1.65E-06	1.7E+00		
RA-226	1.90E-07	2.0E-01		
RA-228	4.93E-09	5.1E-03		
SR-90	2.65E-05	2.8E+01		
U-234	2.33E-04	2.4E+02		
U-235/236	1.57E-06	1.6E+00		
U-238	4.28E-05	4.5E+01		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	5.5E-06	6.0E-09	3.0E-04	2.0E-05
Benzo(a)anthracene	4.6E-09	5.1E-12		
Benzo(a)pyrene	1.0E-09	1.1E-12		
Benzo(g,h,i)perylene	9.5E-11	1.0E-13		
Beryllium	7.8E-08	8.6E-11	5.0E-03	1.7E-08
Lead	6.8E-06	7.5E-09		
U-Total	1.2E-04	1.4E-07	3.0E-03	4.6E-05
Dibenzo(a,h)anthrace	3.1E-10	3.4E-13		
Phenanthrene	6.7E-05	7.4E-08		

Total Pathway: 6.6E-05

Total Rad + Chem 6.6E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	5.48E-06	3.2E-09	3.0E-04	1.1E-05
Benzo(a)anthracene	4.61E-09	2.7E-12		
Benzo(a)pyrene	1.01E-09	5.9E-13		
Benzo(g,h,i)perylene	9.44E-11	5.5E-14		
Beryllium	7.85E-08	4.6E-11	5.0E-03	2.3E-13
Lead	6.77E-06	3.9E-09		
U-Total	1.24E-04	7.3E-08	3.0E-03	2.2E-10
Dibenzo(a,h)anthrace	3.07E-10	1.8E-13		
Phenanthrene	6.58E-05	3.8E-08		

Total Pathway: 1.1E-05

Total Rad + Chem 1.1E-05

Total	
	3.1E-05
	1.7E-08
	4.6E-05
Total:	7.7E-05

TABLE 3.5--2(a)
Constituents of Potential Concern (CPCs)
Lime Sludge Ponds: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC--1[b]	CPC--2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimination[j]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	N	12	12	4070	12800	--	--	9110.833	10962.086	--[e]	--	N	Y	ND[f]	D	N	10962.086
Arsenic	mg/kg	N	12	12	3.5	9.5	--	--	6.350	7.190	--	--	Y	--	0.0366		Y	7.190
Barium	mg/kg	L	12	12	63.3	101	--	--	--	--	86.436	93.709	Y	--	1890	G	N	93.709
Beryllium	mg/kg	N	12	10	0.47	2	0.175	0.35	1.206	1.518	--	--	Y	--	0.0149		Y	1.518
Cadmium	mg/kg	U	12	7	0.96	1.2	0.23	0.95	0.849	--	--	--	Y	--	27	G	N	1.200
Calcium	mg/kg	L	12	12	20100	350000	--	--	--	--	155165.238	415002.746	Y	--	ND	D	N	350000.000
Chromium	mg/kg	N	12	10	5.1	20.1	1.75	1.9	13.196	16.579	--	--	Y	--	135	G	N	16.579
Cobalt	mg/kg	N	12	10	4.1	13.8	0.55	1.9	7.554	9.707	--	--	N	N	4.62	A, B	N	9.707
Copper	mg/kg	U	12	12	16.5	36	--	--	22.942	--	--	--	Y	--	999	G	N	36.000
Iron	mg/kg	N	12	12	3960	23300	--	--	14275.833	18339.474	--	--	N	Y	ND	D	N	18339.474
Lead	mg/kg	N	12	12	1.5	52.7	--	--	19.283	27.563	--	--	N	Y	ND		Y	27.563
Magnesium	mg/kg	N	12	12	8160	27500	--	--	16300.833	19141.502	--	--	Y	--	262000	D	N	19141.502
Manganese	mg/kg	U	12	12	523	1210	--	--	681.667	--	--	--	N	N	3780	A, B	N	1210.000
Mercury	mg/kg	U	12	1	0.27	0.27	0.055	0.09	0.082	--	--	--	N	Y	8.1	G	N	0.270
Molybdenum	mg/kg	U	12	1	1.6	1.6	0.5	1.9	0.971	--	--	--	N	Y	135	G	N	1.600
Nickel	mg/kg	U	12	10	5.2	22.1	3.5	3.85	14.312	--	--	--	N	Y	540	G	N	22.100
Potassium	mg/kg	N	12	10	58.7	2080	31.5	81	1012.450	1413.790	--	--	N	Y	ND	D	N	1413.790
Selenium	mg/kg	U	12	2	0.26	0.37	0.115	0.37	0.200	--	--	--	N	N	135	A, B	N	0.370
Silicon	mg/kg	U	12	12	785	3550	--	--	1481.417	--	--	--	N	Y	ND	E	N	3550.000
Sodium	mg/kg	N	12	12	90.1	410	--	--	191.000	238.190	--	--	Y	--	ND	D	N	238.190
Vanadium	mg/kg	N	12	11	3.6	31	1.9	1.9	21.008	26.250	--	--	N	Y	189	G	N	26.250
Zinc	mg/kg	N	12	11	33.6	96.6	10.9	10.9	51.267	62.195	--	--	Y	--	8100	G	N	62.195
Cyanide	mg/kg	L	10	7	0.15	0.82	0.06	0.095	--	--	0.346	0.896	Y	--	540	G	N	0.820
CS-137	pci/g	L	12	9	0.064	0.89	0.0355	0.045	--	--	0.273	0.702	N	Y	--[h]		Y	0.702
GROSS ALPHA	pci/g	L	12	10	12.9	145	4.72	4.75	--	--	51.123	149.584	*	--	ND		N[i]	145.000
GROSS BETA	pci/g	L	12	12	7.74	108	--	--	--	--	43.608	82.903	*	--	ND		N[i]	82.903
NP-237	pci/g	L	12	12	0.04	0.72	--	--	--	--	0.271	0.773	*	--	--		Y	0.720
PU-238	pci/g	L	12	10	0.04	0.662	0.009	0.015	--	--	0.161	0.576	*	--	--		Y	0.576
PU-239/240	pci/g	L	12	10	0.03	0.2	0.009	0.015	--	--	0.067	0.135	*	--	--		Y	0.135
RA-226	pci/g	N	12	10	0.205	3.47	0.1	0.105	1.324	1.919	--	--	N	Y	--		Y	1.919
RA-228	pci/g	N	12	8	0.709	2.92	0.18	0.23	1.146	1.639	--	--	N	Y	--		Y	1.639
SR-90	pci/g	U	11	2	0.508	0.785	0.0795	0.313	0.270	--	--	--	N	Y	--		Y	0.785
TH-228	pci/g	U	11	10	0.082	2.91	0.155	0.155	1.062	--	--	--	N	Y	--		Y	2.910
TH-230	pci/g	L	11	11	0.373	44.8	--	--	--	--	16.990	151.013	Y	Y	--		Y	44.800
TH-232	pci/g	N	10	9	0.037	2.75	0.112	0.112	0.859	1.306	--	--	N	Y	--		Y	1.306
TH-TOTAL	mg/kg	U	11	11	0.34	25.1	--	--	9.746	--	--	--	*	Y	ND		Y	25.100
U-234	pci/g	L	12	12	1.08	26.5	--	--	--	--	8.904	21.003	Y	--	--		Y	21.003
U-235/236	pci/g	L	12	12	0.025	1.83	--	--	--	--	0.557	1.743	Y	--	--		Y	1.743
U-238	pci/g	L	12	12	0.856	84	--	--	--	--	16.855	71.388	Y	--	--		Y	71.388
U-TOTAL	mg/kg	L	12	12	2.45	244	--	--	--	--	55.536	214.323	*	--	81		Y	214.323
Aroclor-1254	mg/kg	U	12	3	0.043	0.59	0.02	0.035	0.080291	--	--	--	*[g]	--	0.00831		Y	0.059
Anthracene	mg/kg	U	12	3	0.001	0.24	0.2	0.345	0.229666	--	--	--	--	--	8100	G	N	0.24
Benzo(a)anthracene	mg/kg	U	12	3	0.001	0.91	0.2	0.345	0.328	--	--	--	--	--	0.0877		Y	0.91
Benzo(a)pyrene	mg/kg	U	12	3	0.001	1.1	0.2	0.345	0.359666	--	--	--	--	--	0.00877		Y	1.1
Benzo(b)fluoranthene	mg/kg	U	12	3	0.002	1	0.2	0.345	0.33975	--	--	--	--	--	0.0877		Y	1
Benzo(g,h,i)perylene	mg/kg	U	12	1	0.63	0.63	0.195	0.345	0.290416	--	--	--	--	--	ND		Y	0.63
Benzo(k)fluoranthene	mg/kg	U	12	3	0.002	0.8	0.2	0.345	0.321416	--	--	--	--	--	0.877	G	N	0.8
bis(2-Ethylhexyl) phthalate	mg/kg	U	12	8	0.078	10	0.195	0.205	1.15575	--	--	--	--	--	4.57		Y	10
Carbazole	mg/kg	U	12	2	0.071	0.14	0.195	0.345	0.233416	--	--	--	--	--	3.2	G	N	0.14
Chrysene	mg/kg	U	12	4	0.002	1.1	0.2	0.345	0.337916	--	--	--	--	--	8.77	G	N	1.1

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TABLE 3.5-2(a)
Constituents of Potential Concern (CPCs)
Lime Sludge Ponds: Surface Soil

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg; pCi/g)	Reason for Elimination[i]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Di-n-butyl phthalate	mg/kg	U	12	2	0.042	0.12	0.195	0.345	0.219333	-	-	-	-	-	2700	G	N	0.12
Di-n-octyl phthalate	mg/kg	U	8	1	0.087	0.087	0.2	0.345	0.248375	-	-	-	-	-	540	G	N	0.087
Dibenzo(a,h)anthracene	mg/kg	U	12	2	0.24	0.32	0.195	0.345	0.2625	-	-	-	-	-	0.00877		Y	0.32
Dibenzofuran	mg/kg	U	12	1	0.042	0.042	0.195	0.345	0.235583	-	-	-	-	-	108	G	N	0.042
Fluoranthene	mg/kg	U	12	4	0.003	2.1	0.2	0.345	0.47225	-	-	-	-	-	1080	G	N	2.1
Fluorene	mg/kg	U	12	1	0.079	0.079	0.195	0.345	0.238666	-	-	-	-	-	1080	G	N	0.079
Indeno(1,2,3-cd)pyrene	mg/kg	U	12	2	0.58	0.72	0.195	0.345	0.324166	-	-	-	-	-	0.0877		Y	0.72
Phenanthrene	mg/kg	U	12	3	0.001	1.6	0.2	0.345	0.386333	-	-	-	-	-	ND		Y	1.6
Pyrene	mg/kg	U	12	4	0.003	1.9	0.2	0.345	0.437833	-	-	-	-	-	810	G	N	1.9
Acetone	mg/kg	U	12	1	0.002	0.002	0.006	0.047	0.010083	-	-	-	-	-	2700	G	N	0.002
Toluene	mg/kg	U	12	3	0.004	0.017	0.006	0.047	0.01125	-	-	-	-	-	5400	G	N	0.017

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] - Not applicable
[f] • Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[i] Quantitative risk assessment not possible; qualitative use only.
[j] Summary of Screening Criteria:

(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

Table3.5-2(b)
Constituents of Potential Concern (CPC)
Lime Sludge Ponds: Waste Material

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg;pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Aluminum	mg/kg	N	29	29	2700	19700	–	–	9212.759	10808.125	–[e]	–	N	Y	ND[g]	D	N	10808.125
Antimony	mg/kg	U	28	4	20	29.2	0.115	12.85	4.590	–	–	–	N	Y	10.8	G	N	23.200 j
Arsenic	mg/kg	N	29	29	1.7	11.2	–	–	6.048	6.777	–	–	N	Y	0.0366		Y	6.777
Barium	mg/kg	L	29	29	42.4	166	–	–	–	–	85.522	95.462	Y	–	1890	G	N	95.462
Beryllium	mg/kg	L	29	20	0.4	1.8	0.06	0.415	–	–	0.887	1.267	Y	–	0.0149		Y	1.267
Boron	mg/kg	U	2	2	28.9	37	–	–	32.950	–	–	–	•[f]	–	2430	G	N	37.000
Cadmium	mg/kg	L	29	15	0.65	4	0.34	1.05	–	–	1.066	1.284	Y	–	27	G	N	1.284
Calcium	mg/kg	U	29	29	9780	353000	–	–	161292.414	–	–	–	Y	–	ND	D	N	350000.000 j
Chromium	mg/kg	N	29	25	2.2	54.2	1.75	3	15.000	18.520	–	–	N	Y	135	G	N	18.520
Cobalt	mg/kg	N	29	23	3.7	30.2	0.55	2.05	8.198	10.147	–	–	N	Y	1620	G	N	10.147
Copper	mg/kg	N	29	24	8.4	67.1	1.05	9.05	22.826	27.300	–	–	Y	–	999	G	N	27.300
Cyanide	mg/kg	U	23	9	0.11	1.7	0.06	0.12	0.233	–	–	–	Y	–	540	G	N	0.820 j
Iron	mg/kg	N	28	28	3240	74000	–	–	18067.500	23045.106	–	–	N	Y	ND	D	N	23045.106
Lead	mg/kg	U	29	27	0.77	240	0.225	0.405	22.779	–	–	–	N	Y	ND		Y	240.000
Magnesium	mg/kg	L	29	29	4950	40300	–	–	–	–	15331.354	17779.735	N	N	262000	A, B	N	17779.735
Manganese	mg/kg	L	29	29	401	1020	–	–	–	–	606.536	655.109	Y	–	3780	G	N	655.109
Mercury	mg/kg	U	29	4	0.21	2.3	0.04	0.11	0.166	–	–	–	Y	–	8.1	G	N	0.440 j
Molybdenum	mg/kg	U	29	6	1.6	21	0.5	2.55	2.584	–	–	–	N	Y	135	G	N	9.700 j
Nickel	mg/kg	N	29	22	5.2	46.7	2.15	4.15	16.090	19.373	–	–	N	Y	540	G	N	19.373
Potassium	mg/kg	U	29	20	58.7	3010	10.75	655	962.203	–	–	–	N	Y	ND	D	N	2320.000 j
Selenium	mg/kg	U	29	2	0.26	0.29	0.11	2	0.322	–	–	–	N	Y	135	G	N	0.260 j
Silicon	mg/kg	U	29	29	150	7220	–	–	2141.724	–	–	–	Y	–	ND	E	N	5940.000 j
Silver	mg/kg	U	29	4	7.1	22	0.225	2.05	3.050	–	–	–	N	Y	135	G	N	21.700 j
Sodium	mg/kg	L	29	29	70	1620	–	–	–	–	258.187	340.677	Y	–	ND	D	N	340.677
Thallium	mg/kg	N	28	4	0.22	0.51	0.115	0.37	0.215	0.248	–	–	N	Y	1.89	G	N	0.248
Vanadium	mg/kg	N	29	27	3.4	42.2	1.25	1.9	20.957	24.896	–	–	N	Y	189	G	N	24.896
Zinc	mg/kg	N	28	27	8.2	122	10.9	10.9	51.339	60.902	–	–	N	Y	8100	G	N	60.902
CS-137	pci/g	L	29	15	0.029	0.339	0.0029	0.1	–	–	0.112	0.168	Y	–	--[i]		Y	0.168
GROSS ALPHA	pci/g	L	29	22	5.66	99.65	4.15	4.82	–	–	23.393	35.575	•	–	ND		N[h]	35.575
GROSS BETA	pci/g	N	29	26	5.7	77.1	2.885	3.17	23.906	29.515	–	–	•	–	ND		N[h]	29.515
NP-237	pci/g	L	21	21	0.04	0.59	–	–	–	–	0.203	0.323	•	–	--		Y	0.323
PU-238	pci/g	L	29	18	0.03	0.662	0.009	0.3	–	–	0.122	0.199	•	–	--		Y	0.199
PU-239/240	pci/g	L	27	18	0.013	0.47	0.009	0.235	–	–	0.072	0.106	•	–	--		Y	0.106
RA-226	pci/g	L	29	26	0.205	3.48	0.1	0.15	–	–	1.048	1.562	N	Y	--		Y	1.562
RA-228	pci/g	U	29	17	0.59	2	0.18	0.25	0.796	–	–	–	N	Y	--		Y	1.800 j
SR-90	pci/g	U	28	3	0.508	0.959	0.065	0.3135	0.222	–	–	–	N	Y	--		Y	0.841 j
TC-99	pci/g	U	27	3	0.89	1.79	0.025	0.3235	0.313	–	–	–	N	Y	--		Y	1.050 j
TH-228	pci/g	U	26	22	0.082	1.75	0.0565	0.2995	0.723	–	–	–	N	Y	--		Y	1.540 j
TH-230	pci/g	L	27	25	0.294	44.8	0.3	0.6	–	–	4.328	8.381	Y	–	--		Y	8.381
TH-232	pci/g	U	26	22	0.037	1.13	0.112	0.3	0.559	–	–	–	N	N	--	A, B	N	1.070 j
TH-TOTAL	mg/kg	U	26	23	0.34	10.3	0.5	1.135	5.111	–	–	–	•	Y	ND		Y	9.840 j
U-234	pci/g	L	29	29	0.866	19.5	–	–	–	–	4.448	6.176	Y	–	--		Y	6.176
U-235/236	pci/g	L	29	27	0.025	1.313	0.3	0.3	–	–	0.300	0.435	Y	–	--		Y	0.435
U-238	pci/g	L	29	29	0.712	20.4	–	–	–	–	5.106	7.468	Y	–	--		Y	7.468
U-TOTAL	mg/kg	N	29	29	2.08	51.6	–	–	18.324	22.198	–	–	Y	–	81	G	N	22.198
Aroclor-1254	mg/kg	U	31	1	0.043	0.043	0.018	0.19	0.03564516	–	–	–	–	–	0.00831		Y	0.043
Anthracene	mg/kg	U	30	3	0.001	0.082	0.18	0.8	0.26463333	–	–	–	–	–	8100	G	N	0.056 j
Benzo(a)anthracene	mg/kg	U	30	2	0.001	0.61	0.18	0.8	0.29336666	–	–	–	–	–	0.0877	G	N	0.001 j
Benzo(a)pyrene	mg/kg	U	30	2	0.001	0.35	0.18	0.8	0.2847	–	–	–	–	–	0.00877	G	N	0.001 j
Benzo(b)fluoranthene	mg/kg	U	30	3	0.002	0.5	0.18	0.8	0.28423333	–	–	–	–	–	0.0877	G	N	0.055 j
Benzo(g,h,i)perylene	mg/kg	U	30	1	0.17	0.17	0.18	0.8	0.28516666	–	–	–	–	–	ND		Y	0.17
Benzo(k)fluoranthene	mg/kg	U	30	2	0.002	0.45	0.18	0.8	0.28806666	–	–	–	–	–	0.877	G	N	0.002 j
Chrysene	mg/kg	U	30	4	0.002	0.66	0.18	0.8	0.28423333	–	–	–	–	–	8.77	G	N	0.057 j

Table3.5-2(b)
Constituents of Potential Concern (CPC)
Lime Sludge Ponds: Waste Material

Parameter	Units	Dist.	Samples	Hits	Min Hit	Max Hit	Min SQL/ MDA	Max SQL/ MDA	Mean	UCL(N)	Est.Mean	UCL(L)	CPC-1[b]	CPC-2[c]	EPA RAGs[a] Residential Soil (mg/kg;pCi/g)	Reason for Elimin.[k]	Final CPC[d]	Conc. Term (mg/kg; pCi/g)
Di-n-butyl phthalate	mg/kg	U	30	3	0.072	0.14	0.18	0.8	0.26423333	-	-	-	-	-	2700	G	N	0.12 j
Di-n-octyl phthalate	mg/kg	U	26	1	0.087	0.087	0.18	0.8	0.29238461	-	-	-	-	-	540	G	N	0.087
Dibenzo(a,h)anthracene	mg/kg	U	30	1	0.11	0.11	0.18	0.8	0.28316666	-	-	-	-	-	0.00877		Y	0.11
Fluoranthene	mg/kg	U	30	5	0.003	1.3	0.18	0.8	0.3027	-	-	-	-	-	1080	G	N	0.077 j
Indeno(1,2,3-cd)pyrene	mg/kg	U	30	1	0.21	0.21	0.18	0.8	0.2865	-	-	-	-	-	0.0877		Y	0.21
Phenanthrene	mg/kg	U	30	3	0.001	0.25	0.18	0.8	0.2711	-	-	-	-	-	ND		Y	0.082 j
Pyrene	mg/kg	U	30	5	0.003	1	0.18	0.8	0.29163333	-	-	-	-	-	810	G	N	0.064 j
bis(2-Ethylhexyl) phthalate	mg/kg	U	30	16	0.078	10	0.18	0.8	0.624	-	-	-	-	-	4.57	G	N	1.7 j
1,1,2Trichlorotrifluoroethane	mg/kg	U	1	1	0.02	0.02	0	0	0.02	-	-	-	-	-	ND		Y	0.02
1,1-Dichloroethane	mg/kg	U	29	1	0.005	0.005	0.004	0.047	0.00860344	-	-	-	-	-	2700	C	N	0.005
1,2-diethylbenzene	mg/kg	U	1	1	0.041	0.041	0	0	0.041	-	-	-	-	-	ND		Y	0.041
2-Butanone	mg/kg	U	29	1	0.005	0.005	0.0055	0.047	0.00894827	-	-	-	-	-	16200	C	N	0.005
2-Hexanone	mg/kg	U	29	1	0.002	0.002	0.0055	0.047	0.00894827	-	-	-	-	-	1080	G	N	0.002
Acetone	mg/kg	U	29	4	0.002	0.038	0.0055	0.047	0.01072413	-	-	-	-	-	2700	G	N	0.038
Acetonitrile	mg/kg	U	3	1	0.2	0.2	0.0165	0.0235	0.08	-	-	-	-	-	162	G	N	0.2
Acrylonitrile	mg/kg	U	1	1	0.2	0.2	0	0	0.2	-	-	-	-	-	0.119		Y	0.2
Hexane	mg/kg	U	1	1	0.02	0.02	0	0	0.02	-	-	-	-	-	1620	G	N	0.02
Iodomethane	mg/kg	U	3	1	0.02	0.02	0.0085	0.0115	0.01333333	-	-	-	-	-	ND	C	N	0.02
Methylene chloride	mg/kg	U	29	1	0.031	0.031	0.004	0.047	0.01015517	-	-	-	-	-	8.53	G	N	0.031
Toluene	mg/kg	U	29	3	0.002	0.005	0.004	0.047	0.00841379	-	-	-	-	-	5400	G	N	0.004 j

L = Lognormal N = Normal U = Undefined

[a] EPA Risk Assessment Guidance, Part B (EPA 1991d)
[b] Initial screening: CPC is removed if concentration term is below background concentration.
[c] Secondary screening: 95th percentile comparison is made if CPC is removed based on concentration term being less than background concentration and sample set is less than 30. Constituent is removed if concentration term is less than the 95th percentile.
[d] Final screening: CPC is removed based on multiple toxicological screening criteria (Criteria C through G presented below).
[e] - Not applicable
[f] Insufficient toxicity data to screen
[g] EPA RAGs screening criteria were not used for radionuclides; all radionuclides above background or the 95th percentile concentrations were retainted as CPCs.
[h] Quantitative risk assessment not possible; qualitative use only.
[i] No data available to calculate EPA RAGs, Part B screening value.
[j] Non-parametric 95th percentiles were used in lieu of 95th UCLs for these Undefined distributions.
[k] Summary of Screening Criteria:
(A) Concentration term is below background.
(B) Concentration term is below the 95th percentile.
(C) Constituent was identified only once in one medium (i.e., not found in any other media).
(D) Constituent is an essential macronutrient and micronutrient that is nontoxic at levels identified (e.g., Al, Na, K, Mg, Ca, Fe).
(E) Constituent is ubiquitous in nature (e.g., Al, Si, Cl).
(F) Constituent is within a nonspecific class of chemical compounds(e.g., TOC, TPH, PAH, CH, general aqueous chemistry).
(G) Constituent concentration term is below the screening values calculated from the EPA RAGs, Part B, based on a HQ of 0.1 and risk level of 1.0×10^{-7}.

TABLE B3.5-2c
LIME SLUDGE PONDS
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	7.02E-01		2.8E-11	1.9E-11	2.0E-06				
NP-237	7.20E-01		2.2E-10	2.9E-08	4.3E-07				
PU-238	5.76E-01		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	1.35E-01		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.92E+00		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.64E+00		1.0E-10	6.9E-10	2.9E-06				
SR-90	7.85E-01		3.6E-11	6.2E-11					
TH-228	2.91E+00		5.5E-11	7.8E-08	5.6E-06				
TH-230	4.48E+01		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.31E+00		1.7E-10	1.1E-07	8.5E-06				
U-234	2.10E+01		1.6E-11	2.6E-08	3.0E-11				
U-235/236	1.74E+00		1.6E-11	2.5E-08	2.4E-07				
U-238	7.14E+01		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	5.90E-02	6.00E-02	7.70E+00			1.03E+01			
Arsenic	7.19E+00	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)pyrene	1.10E+00		7.30E+00	6.10E+00					
Benzo(a)anthracene	9.10E-01		7.30E-01	6.10E-01					
Benzo(b)fluoranthene	1.00E+00		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	6.30E-01	3.00E-01							
bis(2-Ethylhexyl)phtha	1.00E+01	4.00E-03	1.40E-02			1.40E-02	2.00E-02		2.00E-02
Beryllium	1.52E+00	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	2.76E+01	1.00E-02							
Dibenzo(a,h)anthracen	3.20E-01		7.30E+00	6.10E+00					
Indeno(1,2,3-cd)pyren	7.20E-01		7.30E-01	6.10E-01					
Phenanthrene	1.60E+00	3.00E-01							
TH-TOTAL	2.51E+01	1.00E-02							
U-TOTAL	2.14E+02	1.00E-02					3.00E-03		1.50E-04

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TABLE B3.5-2c
LIME SLUDGE PONDS
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER						
	Future	Future				
	On-site	Off-site				
Contaminant	conc'n (pCi/L	conc'n (pCi/L	SF(o)	SF(i)	SF(e)	SF (derm)
TC-99	2.96	0.17	1.3E-12	8.3E-12	6.0E-13	
CHEM	(mg/L)		SF(o)	SF(i)	SF(e)	SF (derm)

LSP_EPC.XLS; 6/8/94; 6:23 PM

TABLE B3.5-2c
LIME SLUDGE PONDS
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT			*FUTURE; SAME AS CURRENT*		
	On-Subunit	On-Property	Off-Prop	On-Subunit	On-Property	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m
CS-137	1.83E-05	1.05E-05	1.24E-07	1.83E-05	1.05E-05	1.24E-07
NP-237	1.87E-05	1.08E-05	1.28E-07	1.87E-05	1.08E-05	1.28E-07
PU-238	1.50E-05	8.64E-06	1.02E-07	1.50E-05	8.64E-06	1.02E-07
PU-239/240	3.51E-06	2.03E-06	2.39E-08	3.51E-06	2.03E-06	2.39E-08
RA-226	4.99E-05	2.88E-05	3.40E-07	4.99E-05	2.88E-05	3.40E-07
RA-228	4.26E-05	2.46E-05	2.90E-07	4.26E-05	2.46E-05	2.90E-07
SR-90	2.04E-05	1.18E-05	1.39E-07	2.04E-05	1.18E-05	1.39E-07
TH-228	7.57E-05	4.37E-05	5.15E-07	7.57E-05	4.37E-05	5.15E-07
TH-230	1.16E-03	6.72E-04	7.93E-06	1.16E-03	6.72E-04	7.93E-06
TH-232	3.40E-05	1.96E-05	2.31E-07	3.40E-05	1.96E-05	2.31E-07
U-234	5.46E-04	3.15E-04	3.72E-06	5.46E-04	3.15E-04	3.72E-06
U-235/236	4.53E-05	2.61E-05	3.09E-07	4.53E-05	2.61E-05	3.09E-07
U-238	1.86E-03	1.07E-03	1.26E-05	1.86E-03	1.07E-03	1.26E-05
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3
Aroclor-1254	1.53E-09	8.85E-10	1.04E-11	1.53E-09	8.85E-10	1.04E-11
Arsenic	1.87E-07	1.08E-07	1.27E-09	1.87E-07	1.08E-07	1.27E-09
Benzo(a)pyrene	2.86E-08	1.65E-08	1.95E-10	2.86E-08	1.65E-08	1.95E-10
Benzo(a)anthracene	2.37E-08	1.37E-08	1.61E-10	2.37E-08	1.37E-08	1.61E-10
Benzo(b)fluoranthene	2.60E-08	1.50E-08	1.77E-10	2.60E-08	1.50E-08	1.77E-10
Benzo(g,h,i)perylene	1.61E-08	9.51E-09	1.11E-10	1.61E-08	9.51E-09	1.11E-10
bis(2-Ethylhexyl)phthalate	2.60E-07	1.50E-07	1.77E-09	2.60E-07	1.50E-07	1.77E-09
Beryllium	3.95E-08	2.28E-08	2.69E-10	3.95E-08	2.28E-08	2.69E-10
Lead	7.17E-07	4.13E-07	4.88E-09	7.17E-07	4.13E-07	4.88E-09
Dibenzo(a,h)anthracene	8.32E-09	4.80E-09	5.67E-11	8.32E-09	4.80E-09	5.67E-11
Indeno(1,2,3-cd)pyrene	1.87E-08	1.08E-08	1.28E-10	1.87E-08	1.08E-08	1.28E-10
Phenanthrene	4.10E-08	2.42E-08	2.83E-13	4.10E-08	2.42E-08	2.83E-13
TH-TOTAL	6.43E-07	3.79E-07	4.44E-09	6.43E-07	3.79E-07	4.44E-09
U-TOTAL	5.57E-06	3.21E-06	3.80E-08	5.57E-06	3.21E-06	3.80E-08

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TABLE B3.5-2c
LIME SLUDGE PONDS
EXPOSURE POINT CONCENTRATIONS

PERCHED GROUNDWATER							
Contaminant	onc'n (pCi/L)		SF(o)	SF(i)			
NP-237	5.06E+00		2.2E-10	2.9E-08			
SR-90	1.91E+00		3.6E-11	6.2E-11			
TC-99	8.23E+01		1.3E-12	8.3E-12			
CHEM	(mg/L)	Kp	SF(o)	SF(i)	SF(derm)	RfD	RfD(derm)
Arsenic	1.45E-05	1.00E-03	1.75		1.84E+00	3.00E-04	2.85E-04
1,1,2-Trichlorotrifluoroethan	1.66E-04	4.76E-03					
1,2-Diethylbenzene	1.00E-07	6.00E-03					

TABLE B.3.5-4
CURRENT, TRESPASSING YOUTH
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.83E-05	3.8E-02	1.9E-11	7.2E-13
NP-237	1.87E-05	3.9E-02	2.9E-08	1.1E-09
PU-238	1.50E-05	3.1E-02	3.9E-08	1.2E-09
PU-239/240	3.51E-06	7.3E-03	3.8E-08	2.8E-10
RA-226	4.99E-05	1.0E-01	7.0E-09	7.2E-10
RA-228	4.26E-05	8.8E-02	6.9E-10	6.1E-11
SR-90	2.04E-05	4.2E-02	6.2E-11	2.6E-12
TH-228	7.57E-05	1.6E-01	7.8E-08	1.2E-08
TH-230	1.16E-03	2.4E+00	2.9E-08	7.0E-08
TH-232	3.40E-05	7.0E-02	1.1E-07	7.7E-09
U-234	5.46E-04	1.1E+00	2.6E-08	2.9E-08
U-235/236	4.53E-05	9.4E-02	2.5E-08	2.3E-09
U-238	1.86E-03	3.9E+00	5.2E-08	2.0E-07
			Total Pathway:	3.3E-07

Ingestion/Soil

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137	7.02E-01	8.3E+00	2.8E-11	2.3E-10
NP-237	7.20E-01	8.5E+00	2.2E-10	1.9E-09
PU-238	5.76E-01	6.8E+00	2.2E-10	1.5E-09
PU-239/240	1.35E-01	1.6E+00	2.3E-10	3.7E-10
RA-226	1.92E+00	2.3E+01	7.8E-10	1.8E-08
RA-228	1.64E+00	1.9E+01	1.0E-10	1.9E-09
SR-90	7.85E-01	9.3E+00	3.6E-11	3.4E-10
TH-228	2.91E+00	3.5E+01	5.5E-11	1.9E-09
TH-230	4.48E+01	5.3E+02	1.3E-11	6.9E-09
TH-232	1.31E+00	1.6E+01	1.7E-10	2.6E-09
U-234	2.10E+01	2.5E+02	1.6E-11	4.0E-09
U-235/236	1.74E+00	2.1E+01	1.6E-11	3.3E-10
U-238	7.14E+01	8.5E+02	2.8E-11	2.4E-08
			Total Pathway:	6.3E-08

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	1.53E-09	2.9E-12		
Arsenic	1.87E-07	3.5E-10	1.5E+01	5.3E-09
Benzo(a)pyrene	2.86E-08	5.4E-11	6.1E+00	3.3E-10
Benzo(a)anthracene	2.37E-08	4.5E-11	6.1E-01	2.7E-11
Benzo(b)fluoranthene	2.60E-08	4.9E-11	6.1E-01	3.0E-11
Benzo(g,h,i)perylene	1.61E-08	3.0E-11		
bis(2-Ethylhexyl)phthalate	2.60E-07	4.9E-10		
Beryllium	3.95E-08	7.4E-11	8.4E+00	6.3E-10
Lead	7.17E-07	1.4E-09		
Dibenzo(a,h)anthracene	8.32E-09	1.6E-11	6.1E+00	9.6E-11
Indeno(1,2,3-cd)pyrene	1.87E-08	3.5E-11	6.1E-01	2.2E-11
Phenanthrene	4.10E-08	7.7E-11		
TH-TOTAL	6.43E-07	1.2E-09		
U-TOTAL	5.57E-06	1.1E-08		
			Total Pathway:	6.4E-09
			Total Rad + Chem	3.3E-07

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	5.90E-02	6.4E-10	7.7E+00	4.9E-09
Arsenic	7.19E+00	7.8E-08	1.8E+00	1.4E-07
Benzo(a)pyrene	1.10E+00	1.2E-08	7.3E+00	8.7E-08
Benzo(a)anthracene	9.10E-01	9.8E-09	7.3E-01	7.2E-09
Benzo(b)fluoranthene	1.00E+00	1.1E-08	7.3E-01	7.9E-09
Benzo(g,h,i)perylene	6.30E-01	6.8E-09		
bis(2-Ethylhexyl)phthalate	1.00E+01	1.1E-07	1.4E-02	1.5E-09
Beryllium	1.52E+00	1.6E-08	4.3E+00	7.0E-08
Lead	2.76E+01	3.0E-07		
Dibenzo(a,h)anthracene	3.20E-01	3.5E-09	7.3E+00	2.5E-08
Indeno(1,2,3-cd)pyrene	7.20E-01	7.8E-09	7.3E-01	5.7E-09
Phenanthrene	1.60E+00	1.7E-08		
TH-TOTAL	2.51E+01	2.7E-07		
U-TOTAL	2.14E+02	2.3E-06		
			Total Pathway:	3.5E-07
			Total Rad + Chem	4.1E-07

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TABLE B.3.5-4
(continued)

CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil

Not applicable

Total Pathway:

External Radiation/Soil

Compound	Intake	SF(e)	Risk	Total
CS-137	1.5E-01	2.0E-06	3.0E-07	3.0E-07
NP-237	1.5E-01	4.3E-07	6.6E-08	6.9E-08
PU-238	1.2E-01	2.8E-11	3.4E-12	2.7E-09
PU-239/240	2.9E-02	2.7E-11	7.8E-13	6.5E-10
RA-226	4.1E-01	6.0E-06	2.5E-06	2.5E-06
RA-228	3.5E-01	2.9E-06	1.0E-06	1.0E-06
SR-90	1.7E-01			3.4E-10
TH-228	6.2E-01	5.6E-06	3.5E-06	3.5E-06
TH-230	9.6E+00	5.4E-11	5.2E-10	7.7E-08
TH-232	2.8E-01	8.5E-06	2.4E-06	2.4E-06
U-234	4.5E+00	3.0E-11	1.3E-10	3.4E-08
U-235/236	3.7E-01	2.4E-07	8.9E-08	9.2E-08
U-238	1.5E+01	3.6E-08	5.5E-07	7.7E-07

Total Pathway: 1.0E-05

Chemical Risk

Dermal Contact/Soil

Compound	Intake	SF(derm)	Risk	Total
Aroclor-1254	8.4E-09	1.0E+01	8.7E-08	9.2E-08
Arsenic	1.7E-08	1.8E+00	3.2E-08	1.7E-07
Benzo(a)pyrene			8.7E-08	1.7E-07
Benzo(a)anthracene			7.2E-09	1.4E-08
Benzo(b)fluoranthene			7.9E-09	1.6E-08
Benzo(g,h,i)perylene	4.5E-07			
bis(2-Ethylhexyl)phthalate	9.5E-08	1.4E-02	1.3E-09	2.8E-09
Beryllium	3.6E-08		7.0E-08	1.4E-07
Lead	6.6E-07			
Dibenzo(a,h)anthracene			2.5E-08	5.1E-08
Indeno(1,2,3-cd)pyrene			5.7E-09	1.1E-08
Phenanthrene	1.1E-06			
TH-TOTAL	6.0E-07			
U-TOTAL	5.1E-06			

Total Pathway: 3.2E-07

External Radiation/Soil

Compound	Intake	SF(e)	Risk
Not applicable			

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 3.2E-07 1.0E-05 *Total:* 1.1E-05

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TABLE B.3.5-4

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.83E-05	3.8E-02		
NP-237	1.87E-05	3.9E-02		
PU-238	1.50E-05	3.1E-02		
PU-239/240	3.51E-06	7.3E-03		
RA-226	4.99E-05	1.0E-01		
RA-228	4.26E-05	8.8E-02		
SR-90	2.04E-05	4.2E-02		
TH-228	7.57E-05	1.6E-01		
TH-230	1.16E-03	2.4E+00		
TH-232	3.40E-05	7.0E-02		
U-234	5.46E-04	1.1E+00		
U-235/236	4.53E-05	9.4E-02		
U-238	1.86E-03	3.9E+00		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	7.02E-01	8.3E+00		
NP-237	7.20E-01	8.5E+00		
PU-238	5.76E-01	6.8E+00		
PU-239/240	1.35E-01	1.6E+00		
RA-226	1.92E+00	2.3E+01		
RA-228	1.64E+00	1.9E+01		
SR-90	7.85E-01	9.3E+00		
TH-228	2.91E+00	3.5E+01		
TH-230	4.48E+01	5.3E+02		
TH-232	1.31E+00	1.6E+01		
U-234	2.10E+01	2.5E+02		
U-235/236	1.74E+00	2.1E+01		
U-238	7.14E+01	8.5E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.53E-09	1.7E-11		
Arsenic	1.87E-07	2.1E-09		
Benzo(a)pyrene	2.86E-08	3.1E-10		
Benzo(a)anthracene	2.37E-08	2.6E-10		
Benzo(b)fluoranthene	2.60E-08	2.9E-10		
Benzo(g,h,i)perylene	1.61E-08	1.8E-10		
bis(2-Ethylhexyl)phthalate	2.60E-07	2.9E-09		
Beryllium	3.95E-08	4.3E-10		
Lead	7.17E-07	7.9E-09		
Dibenzo(a,h)anthracene	8.32E-09	9.2E-11		
Indeno(1,2,3-cd)pyrene	1.87E-08	2.1E-10		
Phenanthrene	4.10E-08	4.5E-10		
TH-TOTAL	6.43E-07	7.1E-09		
U-TOTAL	5.57E-06	6.1E-08		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	5.90E-02	3.7E-09		
Arsenic	7.19E+00	4.5E-07	3.0E-04	1.5E-03
Benzo(a)pyrene	1.10E+00	6.9E-08		
Benzo(a)anthracene	9.10E-01	5.7E-08		
Benzo(b)fluoranthene	1.00E+00	6.3E-08		
Benzo(g,h,i)perylene	6.30E-01	4.0E-08		
bis(2-Ethylhexyl)phthalate	1.00E+01	6.3E-07	2.0E-02	3.1E-05
Beryllium	1.52E+00	9.6E-08	5.0E-03	1.9E-05
Lead	2.76E+01	1.7E-06		
Dibenzo(a,h)anthracene	3.20E-01	2.0E-08		
Indeno(1,2,3-cd)pyrene	7.20E-01	4.5E-08		
Phenanthrene	1.60E+00	1.0E-07		
TH-TOTAL	2.51E+01	1.6E-06		
U-TOTAL	2.14E+02	1.3E-05	3.0E-03	4.5E-03

Total Pathway: 6.1E-03

Total Rad + Chem 6.1E-03

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TABLE B.3.5-4

NONCARCINOGENIC HAZARD

Radiation Hazard

Dermal Contact/Soil

Not applicable

Total Pathway:

External Radiation/Soil

Compound	Intake	RfD(e)	Hazard
CS-137	1.5E-01		
NP-237	1.5E-01		
PU-238	1.2E-01		
PU-239/240	2.9E-02		
RA-226	4.1E-01		
RA-228	3.5E-01		
SR-90	1.7E-01		
TH-228	6.2E-01		
TH-230	9.6E+00		
TH-232	2.8E-01		
U-234	4.5E+00		
U-235/236	3.7E-01		
U-238	1.5E+01		

Total Pathway:

Chemical Hazard

Dermal Contact/Soil

Compound	Intake	RfD(derm)	Hazard	Total
Aroclor-1254	4.9E-08			
Arsenic	1.0E-07	2.9E-04	3.5E-04	1.9E-03
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene	2.6E-06			
bis(2-Ethylhexyl)phthalate	5.6E-07	2.0E-02	2.8E-05	5.9E-05
Beryllium	2.1E-07	5.0E-05	4.2E-03	4.2E-03
Lead	3.8E-06			
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene	6.7E-06			
TH-TOTAL	3.5E-06			
U-TOTAL	3.0E-05	1.5E-04	2.0E-01	2.0E-01

Total Pathway: 2.0E-01

External Radiation/Soil

Compound	Intake	RfD(e)	Hazard

Not applicable

Total Pathway:

Total Rad + Chem 2.0E-01

Total: 2.1E-01

TABLE B.3.5-5(a)
CURRENT, OFF-PROPERTY FARMER
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.24E-07	1.4E-02	1.9E-11	2.7E-13	2.7E-13
NP-237	1.28E-07	1.5E-02	2.9E-08	4.3E-10	4.3E-10
PU-238	1.02E-07	1.2E-02	3.9E-08	4.6E-10	4.6E-10
PU-239/240	2.39E-08	2.8E-03	3.8E-08	1.1E-10	1.1E-10
RA-226	3.40E-07	3.9E-02	7.0E-09	2.8E-10	2.8E-10
RA-228	2.90E-07	3.4E-02	6.9E-10	2.3E-11	2.3E-11
SR-90	1.39E-07	1.6E-02	6.2E-11	1.0E-12	1.0E-12
TH-228	5.15E-07	6.0E-02	7.8E-08	4.7E-09	4.7E-09
TH-230	7.93E-06	9.2E-01	2.9E-08	2.7E-08	2.7E-08
TH-232	2.31E-07	2.7E-02	1.1E-07	2.9E-09	2.9E-09
U-234	3.72E-06	4.3E-01	2.6E-08	1.1E-08	1.1E-08
U-235/236	3.09E-07	3.6E-02	2.5E-08	9.0E-10	9.0E-10
U-238	1.26E-05	1.5E+00	5.2E-08	7.6E-08	7.6E-08
			Total Pathway:	1.2E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.04E-11	6.7E-13			
Arsenic	1.27E-09	8.2E-11	1.5E+01	1.2E-09	1.2E-09
Benzo(a)pyrene	1.95E-10	1.3E-11	6.1E+00	7.7E-11	7.7E-11
Benzo(a)anthracene	1.61E-10	1.0E-11	6.1E-01	6.4E-12	6.4E-12
Benzo(b)fluoranthene	1.77E-10	1.1E-11	6.1E-01	7.0E-12	7.0E-12
Benzo(g,h,i)perylene	1.11E-10	7.2E-12			
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10			
Beryllium	2.69E-10	1.7E-11	8.4E+00	1.5E-10	1.5E-10
Lead	4.88E-09	3.2E-10			
Dibenzo(a,h)anthracene	5.67E-11	3.7E-12	6.1E+00	2.2E-11	2.2E-11
Indeno(1,2,3-cd)pyrene	1.28E-10	8.3E-12	6.1E-01	5.1E-12	5.1E-12
Phenanthrene	2.83E-13	1.8E-14			
TH-TOTAL	4.44E-09	2.9E-10			
U-TOTAL	3.80E-08	2.5E-09			
			Total Pathway:	1.5E-09	

Total Rad + Chem 1.3E-07 | *Total:* 1.3E-07

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TABLE B.3.5-5(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.24E-07	1.4E-02		
NP-237	1.28E-07	1.5E-02		
PU-238	1.02E-07	1.2E-02		
PU-239/240	2.39E-08	2.8E-03		
RA-226	3.40E-07	3.9E-02		
RA-228	2.90E-07	3.4E-02		
SR-90	1.39E-07	1.6E-02		
TH-228	5.15E-07	6.0E-02		
TH-230	7.93E-06	9.2E-01		
TH-232	2.31E-07	2.7E-02		
U-234	3.72E-06	4.3E-01		
U-235/236	3.09E-07	3.6E-02		
U-238	1.26E-05	1.5E+00		

Total Pathway: 0.0E+00

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.04E-11	6.7E-13		
Arsenic	1.27E-09	8.2E-11		
Benzo(a)pyrene	1.95E-10	1.3E-11		
Benzo(a)anthracene	1.61E-10	1.0E-11		
Benzo(b)fluoranthene	1.77E-10	1.1E-11		
Benzo(g,h,i)perylene	1.11E-10	7.2E-12		
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10		
Beryllium	2.69E-10	1.7E-11		
Lead	4.88E-09	3.2E-10		
Dibenzo(a,h)anthracene	5.67E-11	3.7E-12		
Indeno(1,2,3-cd)pyrene	1.28E-10	8.3E-12		
Phenanthrene	2.83E-13	1.8E-14		
TH-TOTAL	4.44E-09	2.9E-10		
U-TOTAL	3.80E-08	2.5E-09		

Total Pathway: 0.0E+00

Total Rad + Chem 0.0E+00

Total

Total: 0.0E+00

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TABLE B.3.5-5(b)
CURRENT, OFF-PROPERTY CHILD
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.24E-07	2.6E-04	1.9E-11	4.9E-15	4.9E-15
NP-237	1.28E-07	2.7E-04	2.9E-08	7.8E-12	7.8E-12
PU-238	1.02E-07	2.1E-04	3.9E-08	8.4E-12	8.4E-12
PU-239/240	2.39E-08	5.0E-05	3.8E-08	1.9E-12	1.9E-12
RA-226	3.40E-07	7.1E-04	7.0E-09	5.0E-12	5.0E-12
RA-228	2.90E-07	6.1E-04	6.9E-10	4.2E-13	4.2E-13
SR-90	1.39E-07	2.9E-04	6.2E-11	1.8E-14	1.8E-14
TH-228	5.15E-07	1.1E-03	7.8E-08	8.4E-11	8.4E-11
TH-230	7.93E-06	1.7E-02	2.9E-08	4.8E-10	4.8E-10
TH-232	2.31E-07	4.9E-04	1.1E-07	5.3E-11	5.3E-11
U-234	3.72E-06	7.8E-03	2.6E-08	2.0E-10	2.0E-10
U-235/236	3.09E-07	6.5E-04	2.5E-08	1.6E-11	1.6E-11
U-238	1.26E-05	2.6E-02	5.2E-08	1.4E-09	1.4E-09
			Total Pathway:	2.2E-09	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.04E-11	5.7E-14			
Arsenic	1.27E-09	7.0E-12	1.5E+01	1.0E-10	1.0E-10
Benzo(a)pyrene	1.95E-10	1.1E-12	6.1E+00	6.5E-12	6.5E-12
Benzo(a)anthracene	1.61E-10	8.8E-13	6.1E-01	5.4E-13	5.4E-13
Benzo(b)fluoranthene	1.77E-10	9.7E-13	6.1E-01	5.9E-13	5.9E-13
Benzo(g,h,i)perylene	1.11E-10	6.1E-13			
bis(2-Ethylhexyl)phthalate	1.77E-09	9.7E-12			
Beryllium	2.69E-10	1.5E-12	8.4E+00	1.2E-11	1.2E-11
Lead	4.88E-09	2.7E-11			
Dibenzo(a,h)anthracene	5.67E-11	3.1E-13	6.1E+00	1.9E-12	1.9E-12
Indeno(1,2,3-cd)pyrene	1.28E-10	7.0E-13	6.1E-01	4.3E-13	4.3E-13
Phenanthrene	2.83E-13	1.6E-15			
TH-TOTAL	4.44E-09	2.4E-11			
U-TOTAL	3.80E-08	2.1E-10			
			Total Pathway:	1.3E-10	

Total Rad + Chem 2.4E-09 *Total:* 2.4E-09

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TABLE B.3.5-5(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.24E-07	2.6E-04		
NP-237	1.28E-07	2.7E-04		
PU-238	1.02E-07	2.1E-04		
PU-239/240	2.39E-08	5.0E-05		
RA-226	3.40E-07	7.1E-04		
RA-228	2.90E-07	6.1E-04		
SR-90	1.39E-07	2.9E-04		
TH-228	5.15E-07	1.1E-03		
TH-230	7.93E-06	1.7E-02		
TH-232	2.31E-07	4.9E-04		
U-234	3.72E-06	7.8E-03		
U-235/236	3.09E-07	6.5E-04		
U-238	1.26E-05	2.6E-02		

Total Pathway: 0.0E+00

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.04E-11	6.6E-13		
Arsenic	1.27E-09	8.1E-11		
Benzo(a)pyrene	1.95E-10	1.2E-11		
Benzo(a)anthracene	1.61E-10	1.0E-11		
Benzo(b)fluoranthene	1.77E-10	1.1E-11		
Benzo(g,h,i)perylene	1.11E-10	7.1E-12		
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10		
Beryllium	2.69E-10	1.7E-11		
Lead	4.88E-09	3.1E-10		
Dibenzo(a,h)anthracene	5.67E-11	3.6E-12		
Indeno(1,2,3-cd)pyrene	1.28E-10	8.2E-12		
Phenanthrene	2.83E-13	1.8E-14		
TH-TOTAL	4.44E-09	2.8E-10		
U-TOTAL	3.80E-08	2.4E-09		

Total Pathway: 0.0E+00

Total Rad + Chem 0.0E+00

Total

Total: 0.0E+00

TABLE B.3.5-6(a)
CURRENT, OFF-PROPERTY FARMER
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.80E-04	5.1E-01	2.8E-11	1.4E-11	CS-137	9.80E-05	7.2E-01	2.8E-11	2.0E-11	3.5E-11
NP-237	3.46E-07	6.4E-04	2.2E-10	1.4E-13	NP-237	3.14E-08	2.3E-04	2.2E-10	5.1E-14	1.9E-13
PU-238	2.59E-09	4.8E-06	2.2E-10	1.0E-15	PU-238	5.18E-10	3.8E-06	2.2E-10	8.4E-16	1.9E-15
PU-239/240	6.50E-10	1.2E-06	2.3E-10	2.7E-16	PU-239/240	1.30E-10	9.6E-07	2.3E-10	2.2E-16	4.9E-16
RA-226	6.07E-06	1.1E-02	7.8E-10	8.7E-12	RA-226	1.09E-05	8.0E-02	7.8E-10	6.3E-11	7.1E-11
RA-228	3.31E-06	6.1E-03	1.0E-10	6.1E-13	RA-228	5.95E-06	4.4E-02	1.0E-10	4.4E-12	5.0E-12
SR-90	4.69E-06	8.6E-03	3.6E-11	3.1E-13	SR-90	2.34E-05	1.7E-01	3.6E-11	6.2E-12	6.5E-12
TH-228	1.28E-07	2.3E-04	5.5E-11	1.3E-14	TH-228	1.07E-07	7.8E-04	5.5E-11	4.3E-14	5.6E-14
TH-230	9.57E-06	1.8E-02	1.3E-11	2.3E-13	TH-230	7.98E-06	5.9E-02	1.3E-11	7.6E-13	9.9E-13
TH-232	2.80E-07	5.1E-04	1.7E-10	8.7E-14	TH-232	2.33E-07	1.7E-03	1.7E-10	2.9E-13	3.8E-13
U-234	3.21E-05	5.9E-02	1.6E-11	9.4E-13	U-234	9.64E-05	7.1E-01	1.6E-11	1.1E-11	1.2E-11
U-235/236	2.67E-06	4.9E-03	1.6E-11	7.8E-14	U-235/236	8.01E-06	5.9E-02	1.6E-11	9.4E-13	1.0E-12
U-238	1.09E-04	2.0E-01	2.8E-11	5.6E-12	U-238	3.27E-04	2.4E+00	2.8E-11	6.7E-11	7.3E-11
			Total Pathway:	3.1E-11				Total Pathway:	1.7E-10	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	9.2E-08	9.4E-11	7.7E+00	7.3E-10	Aroclor-1254	2.9E-08	1.2E-10	7.7E+00	9.2E-10	1.6E-09
Arsenic	3.9E-07	4.0E-10	1.8E+00	7.0E-10	Arsenic	1.2E-08	4.8E-11	1.8E+00	8.4E-11	7.8E-10
Benzo(a)pyrene	2.9E-07	3.0E-10	7.3E+00	2.2E-09	Benzo(a)pyrene	9.2E-08	3.8E-10	7.3E+00	2.7E-09	4.9E-09
Benzo(a)anthracene	9.0E-08	9.3E-11	7.3E-01	6.8E-11	Benzo(a)anthracene	2.9E-08	1.2E-10	7.3E-01	8.6E-11	1.5E-10
Benzo(b)fluoranthene	2.7E-07	2.8E-10	7.3E-01	2.0E-10	Benzo(b)fluoranthene	8.5E-08	3.5E-10	7.3E-01	2.6E-10	4.6E-10
Benzo(g,h,i)perylene	2.1E-06	2.2E-09			Benzo(g,h,i)perylene	6.7E-07	2.8E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	1.4E-08	1.4E-02	1.9E-10	bis(2-Ethylhexyl)phthalate	4.2E-06	1.7E-08	1.4E-02	2.4E-10	4.3E-10
Beryllium	2.6E-08	2.7E-11	4.3E+00	1.2E-10	Beryllium	2.4E-11	9.8E-14	4.3E+00	4.2E-13	1.2E-10
Lead	9.7E-08	9.9E-11			Lead	8.1E-08	3.3E-10			
Dibenzo(a,h)anthracene	4.6E-07	4.7E-10	7.3E+00	3.4E-09	Dibenzo(a,h)anthracene	1.5E-07	6.0E-10	7.3E+00	4.4E-09	7.8E-09
Indeno(1,2,3-cd)pyrene	5.6E-07	5.8E-10	7.3E-01	4.2E-10	Indeno(1,2,3-cd)pyrene	1.8E-07	7.3E-10	7.3E-01	5.3E-10	9.5E-10
Phenanthrene	1.2E-11	1.2E-14			Phenanthrene	3.8E-12	1.5E-14			
TH-TOTAL	5.4E-09	5.5E-12			TH-TOTAL	4.5E-09	1.8E-11			
U-TOTAL	4.4E-07	4.5E-10			U-TOTAL	1.3E-06	5.5E-09			
			Total Pathway:	8.0E-09				Total Pathway:	9.2E-09	
			Total Rad + Chem	8.1E-09				Total Rad + Chem	9.4E-09	*Total:* 1.7E-08

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TABLE B.3.5-6(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.8E-04	5.1E-01			CS-137	9.80E-05	7.2E-01			
NP-237	3.5E-07	6.4E-04			NP-237	3.14E-08	2.3E-04			
PU-238	2.6E-09	4.8E-06			PU-238	5.18E-10	3.8E-06			
PU-239/240	6.5E-10	1.2E-06			PU-239/240	1.30E-10	9.6E-07			
RA-226	6.1E-06	1.1E-02			RA-226	1.09E-05	8.0E-02			
RA-228	3.3E-06	6.1E-03			RA-228	5.95E-06	4.4E-02			
SR-90	4.7E-06	8.6E-03			SR-90	2.34E-05	1.7E-01			
TH-228	1.3E-07	2.3E-04			TH-228	1.07E-07	7.8E-04			
TH-230	9.6E-06	1.8E-02			TH-230	7.98E-06	5.9E-02			
TH-232	2.8E-07	5.1E-04			TH-232	2.33E-07	1.7E-03			
U-234	3.2E-05	5.9E-02			U-234	9.64E-05	7.1E-01			
U-235/236	2.7E-06	4.9E-03			U-235/236	8.01E-06	5.9E-02			
U-238	1.1E-04	2.0E-01			U-238	3.27E-04	2.4E+00			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	9.2E-08	9.4E-11			Aroclor-1254	2.9E-08	1.2E-10			
Arsenic	3.9E-07	4.0E-10	3.0E-04	1.3E-06	Arsenic	1.2E-08	4.8E-11	3.0E-04	1.6E-07	1.5E-06
Benzo(a)pyrene	2.9E-07	3.0E-10			Benzo(a)pyrene	9.2E-08	3.8E-10			
Benzo(a)anthracene	9.0E-08	9.3E-11			Benzo(a)anthracene	2.9E-08	1.2E-10			
Benzo(b)fluoranthene	2.7E-07	2.8E-10			Benzo(b)fluoranthene	8.5E-08	3.5E-10			
Benzo(g,h,i)perylene	2.1E-06	2.2E-09			Benzo(g,h,i)perylene	6.7E-07	2.8E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	1.4E-08	2.0E-02	6.8E-07	bis(2-Ethylhexyl)phthalate	4.2E-06	1.7E-08	2.0E-02	8.6E-07	1.5E-06
Beryllium	2.6E-08	2.7E-11	5.0E-03	5.4E-09	Beryllium	2.4E-11	9.8E-14	5.0E-03	2.0E-11	5.4E-09
Lead	9.7E-08	9.9E-11			Lead	8.1E-08	3.3E-10			
Dibenzo(a,h)anthracene	4.6E-07	4.7E-10			Dibenzo(a,h)anthracene	1.5E-07	6.0E-10			
Indeno(1,2,3-cd)pyrene	5.6E-07	5.8E-10			Indeno(1,2,3-cd)pyrene	1.8E-07	7.3E-10			
Phenanthrene	1.2E-11	1.2E-14			Phenanthrene	3.8E-12	1.5E-14			
TH-TOTAL	5.4E-09	5.5E-12			TH-TOTAL	4.5E-09	1.8E-11			
U-TOTAL	4.4E-07	4.5E-10	3.0E-03	1.5E-07	U-TOTAL	1.3E-06	5.5E-09	3.0E-03	1.8E-06	2.0E-06
			Total Pathway:	2.2E-06				Total Pathway:	2.8E-06	
			Total Rad + Chem	2.2E-06				Total Rad + Chem	2.8E-06	*Total:* 5.0E-06

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TABLE B.3.5-6(b)
CURRENT, OFF-PROPERTY CHILD
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.80E-04	1.7E-02	2.8E-11	4.8E-13	CS-137	9.80E-05	1.4E-01	2.8E-11	3.9E-12	4.4E-12
NP-237	3.46E-07	2.1E-05	2.2E-10	4.6E-15	NP-237	3.14E-08	4.5E-05	2.2E-10	9.9E-15	1.5E-14
PU-238	2.59E-09	1.6E-07	2.2E-10	3.5E-17	PU-238	5.18E-10	7.4E-07	2.2E-10	1.6E-16	2.0E-16
PU-239/240	6.50E-10	4.0E-08	2.3E-10	9.1E-18	PU-239/240	1.30E-10	1.9E-07	2.3E-10	4.3E-17	5.2E-17
RA-226	6.07E-06	3.7E-04	7.8E-10	2.9E-13	RA-226	1.09E-05	1.6E-02	7.8E-10	1.2E-11	1.2E-11
RA-228	3.31E-06	2.0E-04	1.0E-10	2.0E-14	RA-228	5.95E-06	8.5E-03	1.0E-10	8.5E-13	8.7E-13
SR-90	4.69E-06	2.9E-04	3.6E-11	1.0E-14	SR-90	2.34E-05	3.3E-02	3.6E-11	1.2E-12	1.2E-12
TH-228	1.28E-07	7.8E-06	5.5E-11	4.3E-16	TH-228	1.07E-07	1.5E-04	5.5E-11	8.4E-15	8.8E-15
TH-230	9.57E-06	5.8E-04	1.3E-11	7.6E-15	TH-230	7.98E-06	1.1E-02	1.3E-11	1.5E-13	1.6E-13
TH-232	2.80E-07	1.7E-05	1.7E-10	2.9E-15	TH-232	2.33E-07	3.3E-04	1.7E-10	5.7E-14	5.9E-14
U-234	3.21E-05	2.0E-03	1.6E-11	3.1E-14	U-234	9.64E-05	1.4E-01	1.6E-11	2.2E-12	2.2E-12
U-235/236	2.67E-06	1.6E-04	1.6E-11	2.6E-15	U-235/236	8.01E-06	1.1E-02	1.6E-11	1.8E-13	1.9E-13
U-238	1.09E-04	6.6E-03	2.8E-11	1.9E-13	U-238	3.27E-04	4.7E-01	2.8E-11	1.3E-11	1.3E-11
			Total Pathway:	1.0E-12				Total Pathway:	3.4E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	9.2E-08	1.5E-11	7.7E+00	1.1E-10	Aroclor-1254	2.9E-08	1.1E-10	7.7E+00	8.3E-10	9.5E-10
Arsenic	3.9E-07	6.2E-11	1.8E+00	1.1E-10	Arsenic	1.2E-08	4.4E-11	1.8E+00	7.6E-11	1.8E-10
Benzo(a)pyrene	2.9E-07	4.6E-11	7.3E+00	3.4E-10	Benzo(a)pyrene	9.2E-08	3.4E-10	7.3E+00	2.5E-09	2.8E-09
Benzo(a)anthracene	9.0E-08	1.4E-11	7.3E-01	1.0E-11	Benzo(a)anthracene	2.9E-08	1.1E-10	7.3E-01	7.8E-11	8.8E-11
Benzo(b)fluoranthene	2.7E-07	4.3E-11	7.3E-01	3.1E-11	Benzo(b)fluoranthene	8.5E-08	3.2E-10	7.3E-01	2.3E-10	2.6E-10
Benzo(g,h,i)perylene	2.1E-06	3.4E-10			Benzo(g,h,i)perylene	6.7E-07	2.5E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	2.1E-09	1.4E-02	3.0E-11	bis(2-Ethylhexyl)phthalate	4.2E-06	1.6E-08	1.4E-02	2.2E-10	2.5E-10
Beryllium	2.6E-08	4.2E-12	4.3E+00	1.8E-11	Beryllium	2.4E-11	8.8E-14	4.3E+00	3.8E-13	1.8E-11
Lead	9.7E-08	1.5E-11			Lead	8.1E-08	3.0E-10			
Dibenzo(a,h)anthracene	4.6E-07	7.3E-11	7.3E+00	5.3E-10	Dibenzo(a,h)anthracene	1.5E-07	5.4E-10	7.3E+00	3.9E-09	4.5E-09
Indeno(1,2,3-cd)pyrene	5.6E-07	8.9E-11	7.3E-01	6.5E-11	Indeno(1,2,3-cd)pyrene	1.8E-07	6.6E-10	7.3E-01	4.8E-10	5.5E-10
Phenanthrene	1.2E-11	1.9E-15			Phenanthrene	3.8E-12	1.4E-14			
TH-TOTAL	5.4E-09	8.5E-13			TH-TOTAL	4.5E-09	1.7E-11			
U-TOTAL	4.4E-07	7.0E-11			U-TOTAL	1.3E-06	4.9E-09			
			Total Pathway:	1.2E-09				Total Pathway:	8.4E-09	
			Total Rad + Chem	1.2E-09				Total Rad + Chem	8.4E-09	*Total:* 9.6E-09

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TABLE B.3.5-6(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.8E-04	1.7E-02			CS-137	9.80E-05	1.4E-01			
NP-237	3.5E-07	2.1E-05			NP-237	3.14E-08	4.5E-05			
PU-238	2.6E-09	1.6E-07			PU-238	5.18E-10	7.4E-07			
PU-239/240	6.5E-10	4.0E-08			PU-239/240	1.30E-10	1.9E-07			
RA-226	6.1E-06	3.7E-04			RA-226	1.09E-05	1.6E-02			
RA-228	3.3E-06	2.0E-04			RA-228	5.95E-06	8.5E-03			
SR-90	4.7E-06	2.9E-04			SR-90	2.34E-05	3.3E-02			
TH-228	1.3E-07	7.8E-06			TH-228	1.07E-07	1.5E-04			
TH-230	9.6E-06	5.8E-04			TH-230	7.98E-06	1.1E-02			
TH-232	2.8E-07	1.7E-05			TH-232	2.33E-07	3.3E-04			
U-234	3.2E-05	2.0E-03			U-234	9.64E-05	1.4E-01			
U-235/236	2.7E-06	1.6E-04			U-235/236	8.01E-06	1.1E-02			
U-238	1.1E-04	6.6E-03			U-238	3.27E-04	4.7E-01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	9.2E-08	1.7E-10			Aroclor-1254	2.9E-08	1.3E-09			
Arsenic	3.9E-07	7.2E-10	3.0E-04	2.4E-06	Arsenic	1.2E-08	5.1E-10	3.0E-04	1.7E-06	4.1E-06
Benzo(a)pyrene	2.9E-07	5.4E-10			Benzo(a)pyrene	9.2E-08	4.0E-09			
Benzo(a)anthracene	9.0E-08	1.7E-10			Benzo(a)anthracene	2.9E-08	1.2E-09			
Benzo(b)fluoranthene	2.7E-07	5.0E-10			Benzo(b)fluoranthene	8.5E-08	3.7E-09			
Benzo(g,h,i)perylene	2.1E-06	3.9E-09			Benzo(g,h,i)perylene	6.7E-07	2.9E-08			
bis(2-Ethylhexyl)phthalate	1.3E-05	2.5E-08	2.0E-02	1.2E-06	bis(2-Ethylhexyl)phthalate	4.2E-06	1.8E-07	2.0E-02	9.1E-06	1.0E-05
Beryllium	2.6E-08	4.9E-11	5.0E-03	9.8E-09	Beryllium	2.4E-11	1.0E-12	5.0E-03	2.1E-10	1.0E-08
Lead	9.7E-08	1.8E-10			Lead	8.1E-08	3.5E-09			
Dibenzo(a,h)anthracene	4.6E-07	8.5E-10			Dibenzo(a,h)anthracene	1.5E-07	6.3E-09			
Indeno(1,2,3-cd)pyrene	5.6E-07	1.0E-09			Indeno(1,2,3-cd)pyrene	1.8E-07	7.7E-09			
Phenanthrene	1.2E-11	2.2E-14			Phenanthrene	3.8E-12	1.6E-13			
TH-TOTAL	5.4E-09	1.0E-11			TH-TOTAL	4.5E-09	1.9E-10			
U-TOTAL	4.4E-07	8.2E-10	3.0E-03	2.7E-07	U-TOTAL	1.3E-06	5.8E-08	3.0E-03	1.9E-05	2.0E-05
			Total Pathway:	3.9E-06				Total Pathway:	3.0E-05	
			Total Rad + Chem	3.9E-06				Total Rad + Chem	3.0E-05	*Total:* 3.4E-05

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TABLE B.3.5-7(a)

CURRENT OFF-PROPERTY FARMER

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.55E-08	1.7E-01	2.8E-11	4.7E-12	CS-137	8.54E-08	8.9E-02	2.8E-11	2.5E-12	7.2E-12
NP-237	6.32E-08	1.2E-01	2.2E-10	2.7E-11	NP-237	6.32E-08	6.6E-02	2.2E-10	1.5E-11	4.2E-11
PU-238	4.99E-08	9.8E-02	2.2E-10	2.2E-11	PU-238	4.99E-08	5.2E-02	2.2E-10	1.1E-11	3.3E-11
PU-239/240	1.17E-08	2.3E-02	2.3E-10	5.3E-12	PU-239/240	1.17E-08	1.2E-02	2.3E-10	2.8E-12	8.1E-12
RA-226	1.71E-07	3.4E-01	7.8E-10	2.6E-10	RA-226	1.71E-07	1.8E-01	7.8E-10	1.4E-10	4.0E-10
RA-228	1.42E-07	2.8E-01	1.0E-10	2.8E-11	RA-228	1.41E-07	1.5E-01	1.0E-10	1.5E-11	4.3E-11
SR-90	7.63E-08	1.5E-01	3.6E-11	5.4E-12	SR-90	7.61E-08	7.9E-02	3.6E-11	2.9E-12	8.3E-12
TH-228	2.52E-07	5.0E-01	5.5E-11	2.7E-11	TH-228	2.45E-07	2.6E-01	5.5E-11	1.4E-11	4.1E-11
TH-230	3.96E-06	7.8E+00	1.3E-11	1.0E-10	TH-230	3.96E-06	4.1E+00	1.3E-11	5.4E-11	1.6E-10
TH-232	1.15E-07	2.3E-01	1.7E-10	3.9E-11	TH-232	1.15E-07	1.2E-01	1.7E-10	2.0E-11	5.9E-11
U-234	1.82E-06	3.6E+00	1.6E-11	5.7E-11	U-234	1.82E-06	1.9E+00	1.6E-11	3.0E-11	8.8E-11
U-235/236	1.51E-07	3.0E-01	1.6E-11	4.8E-12	U-235/236	1.51E-07	1.6E-01	1.6E-11	2.5E-12	7.3E-12
U-238	6.17E-06	1.2E+01	2.8E-11	3.4E-10	U-238	6.17E-06	6.4E+00	2.8E-11	1.8E-10	5.2E-10
			Total Pathway:	9.3E-10				Total Pathway:	4.9E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.93E-08	2.1E-11	7.7E+00	1.6E-10	Aroclor-1254	1.93E-08	1.1E-11	7.7E+00	8.7E-11	2.5E-10
Arsenic	7.66E-07	8.4E-10	1.8E+00	1.5E-09	Arsenic	7.66E-07	4.5E-10	1.8E+00	7.8E-10	2.3E-09
Benzo(a)pyrene	9.95E-08	1.1E-10	7.3E+00	8.0E-10	Benzo(a)pyrene	9.88E-08	5.8E-11	7.3E+00	4.2E-10	1.2E-09
Benzo(a)anthracene	8.48E-08	9.3E-11	7.3E-01	6.8E-11	Benzo(a)anthracene	8.42E-08	4.9E-11	7.3E-01	3.6E-11	1.0E-10
Benzo(b)fluoranthene	8.96E-08	9.9E-11	7.3E-01	7.2E-11	Benzo(b)fluoranthene	8.89E-08	5.2E-11	7.3E-01	3.8E-11	1.1E-10
Benzo(g,h,i)perylene	5.48E-08	6.0E-11			Benzo(g,h,i)perylene	5.44E-08	3.2E-11			
bis(2-Ethylhexyl)phthalat	8.67E-07	9.6E-10	1.4E-02	1.3E-11	bis(2-Ethylhexyl)phthalat	8.67E-07	5.1E-10	1.4E-02	7.1E-12	2.0E-11
Beryllium	1.41E-07	1.6E-10	4.3E+00	6.7E-10	Beryllium	1.41E-07	8.2E-11	4.3E+00	3.5E-10	1.0E-09
Lead	2.55E-06	2.8E-09			Lead	2.55E-06	1.5E-09			
Dibenzo(a,h)anthracene	2.83E-08	3.1E-11	7.3E+00	2.3E-10	Dibenzo(a,h)anthracene	2.82E-08	1.6E-11	7.3E+00	1.2E-10	3.5E-10
Indeno(1,2,3-cd)pyrene	6.41E-08	7.1E-11	7.3E-01	5.2E-11	Indeno(1,2,3-cd)pyrene	6.36E-08	3.7E-11	7.3E-01	2.7E-11	7.9E-11
Phenanthrene	1.47E-10	1.6E-13			Phenanthrene	1.43E-10	8.4E-14			
TH-TOTAL	2.22E-06	2.4E-09			TH-TOTAL	2.22E-06	1.3E-09			
U-TOTAL	1.97E-05	2.2E-08			U-TOTAL	1.97E-05	1.1E-08			
			Total Pathway:	3.5E-09				Total Pathway:	1.9E-09	
			Total Rad + Chem	4.5E-09				Total Rad + Chem	2.4E-09	*Total:* 6.8E-09

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TABLE B.3.5-7(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	8.6E-08				CS-137	8.54E-08				
NP-237	6.3E-08				NP-237	6.32E-08				
PU-238	5.0E-08				PU-238	4.99E-08				
PU-239/240	1.2E-08				PU-239/240	1.17E-08				
RA-226	1.7E-07				RA-226	1.71E-07				
RA-228	1.4E-07				RA-228	1.41E-07				
SR-90	7.6E-08				SR-90	7.61E-08				
TH-228	2.5E-07				TH-228	2.45E-07				
TH-230	4.0E-06				TH-230	3.96E-06				
TH-232	1.2E-07				TH-232	1.15E-07				
U-234	1.8E-06				U-234	1.82E-06				
U-235/236	1.5E-07				U-235/236	1.51E-07				
U-238	6.2E-06				U-238	6.17E-06				
	Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.9E-08	2.1E-11			Aroclor-1254	1.93E-08	1.1E-11			
Arsenic	7.7E-07	8.4E-10	3.0E-04	2.8E-06	Arsenic	7.66E-07	4.5E-10	3.0E-04	1.5E-06	4.3E-06
Benzo(a)pyrene	1.0E-07	1.1E-10			Benzo(a)pyrene	9.88E-08	5.8E-11			
Benzo(a)anthracene	8.5E-08	9.3E-11			Benzo(a)anthracene	8.42E-08	4.9E-11			
Benzo(b)fluoranthene	9.0E-08	9.9E-11			Benzo(b)fluoranthene	8.89E-08	5.2E-11			
Benzo(g,h,i)perylene	5.5E-08	6.0E-11			Benzo(g,h,i)perylene	5.44E-08	3.2E-11			
bis(2-Ethylhexyl)phthala	8.7E-07	9.6E-10	2.0E-02	4.8E-08	bis(2-Ethylhexyl)phthala	8.67E-07	5.1E-10	2.0E-02	2.5E-08	7.3E-08
Beryllium	1.4E-07	1.6E-10	5.0E-03	3.1E-08	Beryllium	1.41E-07	8.2E-11	5.0E-03	1.6E-08	4.8E-08
Lead	2.5E-06	2.8E-09			Lead	2.55E-06	1.5E-09			
Dibenzo(a,h)anthracene	2.8E-08	3.1E-11			Dibenzo(a,h)anthracene	2.82E-08	1.6E-11			
Indeno(1,2,3-cd)pyrene	6.4E-08	7.1E-11			Indeno(1,2,3-cd)pyrene	6.36E-08	3.7E-11			
Phenanthrene	1.5E-10	1.6E-13			Phenanthrene	1.43E-10	8.4E-14			
TH-TOTAL	2.2E-06	2.4E-09			TH-TOTAL	2.22E-06	1.3E-09			
U-TOTAL	2.0E-05	2.2E-08	3.0E-03	7.2E-06	U-TOTAL	1.97E-05	1.1E-08	3.0E-03	3.8E-06	1.1E-05
			Total Pathway:	1.0E-05				Total Pathway:	5.4E-06	
			Total Rad + Chem	1.0E-05				Total Rad + Chem	5.4E-06	*Total:* 1.5E-05

TABLE B.3.5-7(b)

CURRENT OFF-PROPERTY CHILD

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.55E-08	7.2E-03	2.8E-11	2.0E-13	CS-137	8.54E-08	1.1E-02	2.8E-11	3.1E-13	5.1E-13
NP-237	6.32E-08	5.3E-03	2.2E-10	1.2E-12	NP-237	6.32E-08	8.1E-03	2.2E-10	1.8E-12	3.0E-12
PU-238	4.99E-08	4.2E-03	2.2E-10	9.2E-13	PU-238	4.99E-08	6.4E-03	2.2E-10	1.4E-12	2.3E-12
PU-239/240	1.17E-08	9.8E-04	2.3E-10	2.3E-13	PU-239/240	1.17E-08	1.5E-03	2.3E-10	3.5E-13	5.7E-13
RA-226	1.71E-07	1.4E-02	7.8E-10	1.1E-11	RA-226	1.71E-07	2.2E-02	7.8E-10	1.7E-11	2.8E-11
RA-228	1.42E-07	1.2E-02	1.0E-10	1.2E-12	RA-228	1.41E-07	1.8E-02	1.0E-10	1.8E-12	3.0E-12
SR-90	7.63E-08	6.4E-03	3.6E-11	2.3E-13	SR-90	7.61E-08	9.8E-03	3.6E-11	3.5E-13	5.8E-13
TH-228	2.52E-07	2.1E-02	5.5E-11	1.2E-12	TH-228	2.45E-07	3.1E-02	5.5E-11	1.7E-12	2.9E-12
TH-230	3.96E-06	3.3E-01	1.3E-11	4.3E-12	TH-230	3.96E-06	5.1E-01	1.3E-11	6.6E-12	1.1E-11
TH-232	1.15E-07	9.7E-03	1.7E-10	1.6E-12	TH-232	1.15E-07	1.5E-02	1.7E-10	2.5E-12	4.2E-12
U-234	1.82E-06	1.5E-01	1.6E-11	2.4E-12	U-234	1.82E-06	2.3E-01	1.6E-11	3.7E-12	6.2E-12
U-235/236	1.51E-07	1.3E-02	1.6E-11	2.0E-13	U-235/236	1.51E-07	1.9E-02	1.6E-11	3.1E-13	5.1E-13
U-238	6.17E-06	5.2E-01	2.8E-11	1.5E-11	U-238	6.17E-06	7.9E-01	2.8E-11	2.2E-11	3.7E-11
			Total Pathway:	3.9E-11				Total Pathway:	6.0E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.93E-08	4.2E-12	7.7E+00	3.3E-11	Aroclor-1254	1.93E-08	6.5E-12	7.7E+00	5.0E-11	8.2E-11
Arsenic	7.66E-07	1.7E-10	1.8E+00	2.9E-10	Arsenic	7.66E-07	2.6E-10	1.8E+00	4.5E-10	7.4E-10
Benzo(a)pyrene	9.95E-08	2.2E-11	7.3E+00	1.6E-10	Benzo(a)pyrene	9.88E-08	3.3E-11	7.3E+00	2.4E-10	4.0E-10
Benzo(a)anthracene	8.48E-08	1.9E-11	7.3E-01	1.4E-11	Benzo(a)anthracene	8.42E-08	2.8E-11	7.3E-01	2.1E-11	3.4E-11
Benzo(b)fluoranthene	8.96E-08	2.0E-11	7.3E-01	1.4E-11	Benzo(b)fluoranthene	8.89E-08	3.0E-11	7.3E-01	2.2E-11	3.6E-11
Benzo(g,h,i)perylene	5.48E-08	1.2E-11			Benzo(g,h,i)perylene	5.44E-08	1.8E-11			
bis(2-Ethylhexyl)phthalat	8.67E-07	1.9E-10	1.4E-02	2.7E-12	bis(2-Ethylhexyl)phthalat	8.67E-07	2.9E-10	1.4E-02	4.1E-12	6.7E-12
Beryllium	1.41E-07	3.1E-11	4.3E+00	1.3E-10	Beryllium	1.41E-07	4.7E-11	4.3E+00	2.0E-10	3.4E-10
Lead	2.55E-06	5.6E-10			Lead	2.55E-06	8.5E-10			
Dibenzo(a,h)anthracene	2.83E-08	6.2E-12	7.3E+00	4.5E-11	Dibenzo(a,h)anthracene	2.82E-08	9.5E-12	7.3E+00	6.9E-11	1.1E-10
Indeno(1,2,3-cd)pyrene	6.41E-08	1.4E-11	7.3E-01	1.0E-11	Indeno(1,2,3-cd)pyrene	6.36E-08	2.1E-11	7.3E-01	1.6E-11	2.6E-11
Phenanthrene	1.47E-10	3.2E-14			Phenanthrene	1.43E-10	4.8E-14			
TH-TOTAL	2.22E-06	4.9E-10			TH-TOTAL	2.22E-06	7.4E-10			
U-TOTAL	1.97E-05	4.3E-09			U-TOTAL	1.97E-05	6.6E-09			
			Total Pathway:	7.0E-10				Total Pathway:	1.1E-09	
			Total Rad + Chem	7.4E-10				Total Rad + Chem	1.1E-09	*Total:* 1.9E-09

TABLE B.3.5-7(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	8.6E-08	7.2E-03			CS-137	8.54E-08	1.1E-02			
NP-237	6.3E-08	5.3E-03			NP-237	6.32E-08	8.1E-03			
PU-238	5.0E-08	4.2E-03			PU-238	4.99E-08	6.4E-03			
PU-239/240	1.2E-08	9.8E-04			PU-239/240	1.17E-08	1.5E-03			
RA-226	1.7E-07	1.4E-02			RA-226	1.71E-07	2.2E-02			
RA-228	1.4E-07	1.2E-02			RA-228	1.41E-07	1.8E-02			
SR-90	7.6E-08	6.4E-03			SR-90	7.61E-08	9.8E-03			
TH-228	2.5E-07	2.1E-02			TH-228	2.45E-07	3.1E-02			
TH-230	4.0E-06	3.3E-01			TH-230	3.96E-06	5.1E-01			
TH-232	1.2E-07	9.7E-03			TH-232	1.15E-07	1.5E-02			
U-234	1.8E-06	1.5E-01			U-234	1.82E-06	2.3E-01			
U-235/236	1.5E-07	1.3E-02			U-235/236	1.51E-07	1.9E-02			
U-238	6.2E-06	5.2E-01			U-238	6.17E-06	7.9E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.9E-08	4.9E-11			Aroclor-1254	1.93E-08	7.6E-11			
Arsenic	7.7E-07	2.0E-09	3.0E-04	6.5E-06	Arsenic	7.66E-07	3.0E-09	3.0E-04	1.0E-05	1.7E-05
Benzo(a)pyrene	1.0E-07	2.5E-10			Benzo(a)pyrene	9.88E-08	3.9E-10			
Benzo(a)anthracene	8.5E-08	2.2E-10			Benzo(a)anthracene	8.42E-08	3.3E-10			
Benzo(b)fluoranthene	9.0E-08	2.3E-10			Benzo(b)fluoranthene	8.89E-08	3.5E-10			
Benzo(g,h,i)perylene	5.5E-08	1.4E-10			Benzo(g,h,i)perylene	5.44E-08	2.1E-10			
bis(2-Ethylhexyl)phthala	8.7E-07	2.2E-09	2.0E-02	1.1E-07	bis(2-Ethylhexyl)phthala	8.67E-07	3.4E-09	2.0E-02	1.7E-07	2.8E-07
Beryllium	1.4E-07	3.6E-10	5.0E-03	7.2E-08	Beryllium	1.41E-07	5.5E-10	5.0E-03	1.1E-07	1.8E-07
Lead	2.5E-06	6.5E-09			Lead	2.55E-06	1.0E-08			
Dibenzo(a,h)anthracene	2.8E-08	7.2E-11			Dibenzo(a,h)anthracene	2.82E-08	1.1E-10			
Indeno(1,2,3-cd)pyrene	6.4E-08	1.6E-10			Indeno(1,2,3-cd)pyrene	6.36E-08	2.5E-10			
Phenanthrene	1.5E-10	3.8E-13			Phenanthrene	1.43E-10	5.6E-13			
TH-TOTAL	2.2E-06	5.7E-09			TH-TOTAL	2.22E-06	8.7E-09			
U-TOTAL	2.0E-05	5.0E-08	3.0E-03	1.7E-05	U-TOTAL	1.97E-05	7.7E-08	3.0E-03	2.6E-05	4.2E-05
			Total Pathway:	2.3E-05				Total Pathway:	3.6E-05	
			Total Rad + Chem	2.3E-05				Total Rad + Chem	3.6E-05	*Total:* 5.9E-05

TABLE B.3.5-8
CURRENT, USER OF MILK AND MEAT
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.39E-02	4.4E+01	2.8E-11	1.2E-09	CS-137	8.36E-03	6.1E+01	2.8E-11	1.7E-09	2.9E-09
NP-237	6.52E-05	1.2E-01	2.2E-10	2.6E-11	NP-237	5.93E-06	4.4E-02	2.2E-10	9.6E-12	3.6E-11
PU-238	2.81E-07	5.2E-04	2.2E-10	1.1E-13	PU-238	5.62E-08	4.1E-04	2.2E-10	9.1E-14	2.0E-13
PU-239/240	1.68E-07	3.1E-04	2.3E-10	7.1E-14	PU-239/240	3.37E-08	2.5E-04	2.3E-10	5.7E-14	1.3E-13
RA-226	1.42E-03	2.6E+00	7.8E-10	2.0E-09	RA-226	2.56E-03	1.9E+01	7.8E-10	1.5E-08	1.7E-08
RA-228	2.83E-04	5.2E-01	1.0E-10	5.2E-11	RA-228	5.09E-04	3.7E+00	1.0E-10	3.7E-10	4.3E-10
SR-90	1.02E-03	1.9E+00	3.6E-11	6.7E-11	SR-90	5.09E-03	3.7E+01	3.6E-11	1.3E-09	1.4E-09
TH-228	1.09E-05	2.0E-02	5.5E-11	1.1E-12	TH-228	9.04E-06	6.6E-02	5.5E-11	3.7E-12	4.8E-12
TH-230	8.87E-04	1.6E+00	1.3E-11	2.1E-11	TH-230	7.39E-04	5.4E+00	1.3E-11	7.1E-11	9.2E-11
TH-232	2.37E-05	4.4E-02	1.7E-10	7.4E-12	TH-232	1.98E-05	1.5E-01	1.7E-10	2.5E-11	3.2E-11
U-234	3.67E-03	6.7E+00	1.6E-11	1.1E-10	U-234	1.10E-02	8.1E+01	1.6E-11	1.3E-09	1.4E-09
U-235/236	3.04E-04	5.6E-01	1.6E-11	8.9E-12	U-235/236	9.12E-04	6.7E+00	1.6E-11	1.1E-10	1.2E-10
U-238	1.25E-02	2.3E+01	2.8E-11	6.4E-10	U-238	3.74E-02	2.7E+02	2.8E-11	7.7E-09	8.3E-09
			Total Pathway:	4.2E-09				Total Pathway:	2.7E-08	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	1.0E-06	1.0E-09	7.7E+00	8.1E-09	Aroclor-1254	3.2E-07	1.3E-09	7.7E+00	1.0E-08	1.8E-08
Arsenic	3.3E-05	3.4E-08	1.8E+00	6.0E-08	Arsenic	9.9E-07	4.1E-09	1.8E+00	7.1E-09	6.7E-08
Benzo(a)pyrene	2.5E-05	2.5E-08	7.3E+00	1.8E-07	Benzo(a)pyrene	7.8E-06	3.2E-08	7.3E+00	2.3E-07	4.2E-07
Benzo(a)anthracene	7.7E-06	7.9E-09	7.3E-01	5.8E-09	Benzo(a)anthracene	2.4E-06	1.0E-08	7.3E-01	7.3E-09	1.3E-08
Benzo(b)fluoranthene	2.3E-05	2.4E-08	7.3E-01	1.7E-08	Benzo(b)fluoranthene	7.2E-06	3.0E-08	7.3E-01	2.2E-08	3.9E-08
Benzo(g,h,i)perylene	1.8E-04	1.9E-07			Benzo(g,h,i)perylene	5.7E-05	2.4E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.2E-06	1.4E-02	1.6E-08	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-06	1.4E-02	2.0E-08	3.7E-08
Beryllium	5.8E-06	5.9E-09	4.3E+00	2.6E-08	Beryllium	5.2E-09	2.1E-11	4.3E+00	9.2E-11	2.6E-08
Lead	1.0E-04	1.1E-07			Lead	8.6E-05	3.5E-07			
Dibenzo(a,h)anthracene	3.9E-05	4.0E-08	7.3E+00	2.9E-07	Dibenzo(a,h)anthracene	1.2E-05	5.0E-08	7.3E+00	3.7E-07	6.6E-07
Indeno(1,2,3-cd)pyrene	4.7E-05	4.9E-08	7.3E-01	3.5E-08	Indeno(1,2,3-cd)pyrene	1.5E-05	6.1E-08	7.3E-01	4.5E-08	8.0E-08
Phenanthrene	1.0E-06	1.0E-09			Phenanthrene	3.2E-07	1.3E-09			
TH-TOTAL	5.0E-07	5.2E-10			TH-TOTAL	4.2E-07	1.7E-09			
U-TOTAL	3.7E-05	3.8E-08			U-TOTAL	1.1E-04	4.6E-07			
			Total Pathway:	6.4E-07				Total Pathway:	7.1E-07	
			Total Rad + Chem	6.5E-07				Total Rad + Chem	7.4E-07	*Total:* 1.4E-06

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TABLE B.3.5-8
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.4E-02	4.4E+01			CS-137	8.36E-03	6.1E+01			
NP-237	6.5E-05	1.2E-01			NP-237	5.93E-06	4.4E-02			
PU-238	2.8E-07	5.2E-04			PU-238	5.62E-08	4.1E-04			
PU-239/240	1.7E-07	3.1E-04			PU-239/240	3.37E-08	2.5E-04			
RA-226	1.4E-03	2.6E+00			RA-226	2.56E-03	1.9E+01			
RA-228	2.8E-04	5.2E-01			RA-228	5.09E-04	3.7E+00			
SR-90	1.0E-03	1.9E+00			SR-90	5.09E-03	3.7E+01			
TH-228	1.1E-05	2.0E-02			TH-228	9.04E-06	6.6E-02			
TH-230	8.9E-04	1.6E+00			TH-230	7.39E-04	5.4E+00			
TH-232	2.4E-05	4.4E-02			TH-232	1.98E-05	1.5E-01			
U-234	3.7E-03	6.7E+00			U-234	1.10E-02	8.1E+01			
U-235/236	3.0E-04	5.6E-01			U-235/236	9.12E-04	6.7E+00			
U-238	1.2E-02	2.3E+01			U-238	3.74E-02	2.7E+02			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.0E-06	1.0E-09			Aroclor-1254	3.2E-07	1.3E-09			
Arsenic	3.3E-05	3.4E-08	3.0E-04	1.1E-04	Arsenic	9.9E-07	4.1E-09	3.0E-04	1.4E-05	1.3E-04
Benzo(a)pyrene	2.5E-05	2.5E-08			Benzo(a)pyrene	7.8E-06	3.2E-08			
Benzo(a)anthracene	7.7E-06	7.9E-09			Benzo(a)anthracene	2.4E-06	1.0E-08			
Benzo(b)fluoranthene	2.3E-05	2.4E-08			Benzo(b)fluoranthene	7.2E-06	3.0E-08			
Benzo(g,h,i)perylene	1.8E-04	1.9E-07			Benzo(g,h,i)perylene	5.7E-05	2.4E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.2E-06	2.0E-02	5.8E-05	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-06	2.0E-02	7.3E-05	1.3E-04
Beryllium	5.8E-06	5.9E-09	5.0E-03	1.2E-06	Beryllium	5.2E-09	2.1E-11	5.0E-03	4.3E-09	1.2E-06
Lead	1.0E-04	1.1E-07			Lead	8.6E-05	3.5E-07			
Dibenzo(a,h)anthracene	3.9E-05	4.0E-08			Dibenzo(a,h)anthracene	1.2E-05	5.0E-08			
Indeno(1,2,3-cd)pyrene	4.7E-05	4.9E-08			Indeno(1,2,3-cd)pyrene	1.5E-05	6.1E-08			
Phenanthrene	1.0E-06	1.0E-09			Phenanthrene	3.2E-07	1.3E-09			
TH-TOTAL	5.0E-07	5.2E-10			TH-TOTAL	4.2E-07	1.7E-09			
U-TOTAL	3.7E-05	3.8E-08	3.0E-03	1.3E-05	U-TOTAL	1.1E-04	4.6E-07	3.0E-03	1.5E-04	1.7E-04
			Total Pathway:	1.9E-04				Total Pathway:	2.4E-04	
			Total Rad + Chem	1.9E-04				Total Rad + Chem	2.4E-04	*Total:* 4.3E-04

TABLE B.3.5-9
CURRENT, GROUNDSKEEPER
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.83E-05	3.2E-01	1.9E-11	6.1E-12
NP-237	1.87E-05	3.3E-01	2.9E-08	9.5E-09
PU-238	1.50E-05	2.6E-01	3.9E-08	1.0E-08
PU-239/240	3.51E-06	6.1E-02	3.8E-08	2.3E-09
RA-226	4.99E-05	8.7E-01	7.0E-09	6.1E-09
RA-228	4.26E-05	7.5E-01	6.9E-10	5.1E-10
SR-90	2.04E-05	3.6E-01	6.2E-11	2.2E-11
TH-228	7.57E-05	1.3E+00	7.8E-08	1.0E-07
TH-230	1.16E-03	2.0E+01	2.9E-08	5.9E-07
TH-232	3.40E-05	6.0E-01	1.1E-07	6.5E-08
U-234	5.46E-04	9.6E+00	2.6E-08	2.5E-07
U-235/236	4.53E-05	7.9E-01	2.5E-08	2.0E-08
U-238	1.86E-03	3.3E+01	5.2E-08	1.7E-06
			Total Pathway:	2.7E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	7.02E-01	6.1E+01	2.8E-11	1.7E-09
NP-237	7.20E-01	6.3E+01	2.2E-10	1.4E-08
PU-238	5.76E-01	5.0E+01	2.2E-10	1.1E-08
PU-239/240	1.35E-01	1.2E+01	2.3E-10	2.7E-09
RA-226	1.92E+00	1.7E+02	7.8E-10	1.3E-07
RA-228	1.64E+00	1.4E+02	1.0E-10	1.4E-08
SR-90	7.85E-01	6.9E+01	3.6E-11	2.5E-09
TH-228	2.91E+00	2.5E+02	5.5E-11	1.4E-08
TH-230	4.48E+01	3.9E+03	1.3E-11	5.1E-08
TH-232	1.31E+00	1.1E+02	1.7E-10	1.9E-08
U-234	2.10E+01	1.8E+03	1.6E-11	2.9E-08
U-235/236	1.74E+00	1.5E+02	1.6E-11	2.4E-09
U-238	7.14E+01	6.2E+03	2.8E-11	1.7E-07
			Total Pathway:	4.7E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	1.53E-09	1.5E-11		
Arsenic	1.87E-07	1.8E-09	1.5E+01	2.7E-08
Benzo(a)pyrene	2.86E-08	2.8E-10	6.1E+00	1.7E-09
Benzo(a)anthracene	2.37E-08	2.3E-10	6.1E-01	1.4E-10
Benzo(b)fluoranthene	2.60E-08	2.5E-10	6.1E-01	1.6E-10
Benzo(g,h,i)perylene	1.61E-08	1.6E-10		
bis(2-Ethylhexyl)phthalate	2.60E-07	2.5E-09		
Beryllium	3.95E-08	3.9E-10	8.4E+00	3.2E-09
Lead	7.17E-07	7.0E-09		
Dibenzo(a,h)anthracene	8.32E-09	8.1E-11	6.1E+00	5.0E-10
Indeno(1,2,3-cd)pyrene	1.87E-08	1.8E-10	6.1E-01	1.1E-10
Phenanthrene	4.10E-08	4.0E-10		
TH-TOTAL	6.43E-07	6.3E-09		
U-TOTAL	5.57E-06	5.5E-08		
			Total Pathway:	3.3E-08
			Total Rad + Chem	2.8E-06

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	5.90E-02	2.9E-09	7.7E+00	2.2E-08
Arsenic	7.19E+00	3.5E-07	1.8E+00	6.2E-07
Benzo(a)pyrene	1.10E+00	5.4E-08	7.3E+00	3.9E-07
Benzo(a)anthracene	9.10E-01	4.5E-08	7.3E-01	3.3E-08
Benzo(b)fluoranthene	1.00E+00	4.9E-08	7.3E-01	3.6E-08
Benzo(g,h,i)perylene	6.30E-01	3.1E-08		
bis(2-Ethylhexyl)phthalate	1.00E+01	4.9E-07	1.4E-02	6.8E-09
Beryllium	1.52E+00	7.4E-08	4.3E+00	3.2E-07
Lead	2.76E+01	1.3E-06		
Dibenzo(a,h)anthracene	3.20E-01	1.6E-08	7.3E+00	1.1E-07
Indeno(1,2,3-cd)pyrene	7.20E-01	3.5E-08	7.3E-01	2.6E-08
Phenanthrene	1.60E+00	7.8E-08		
TH-TOTAL	2.51E+01	1.2E-06		
U-TOTAL	2.14E+02	1.0E-05		
			Total Pathway:	1.6E-06
			Total Rad + Chem	2.0E-06

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TABLE B.3.5-9
(continued)

CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	5.6E-01	2.0E-06	1.1E-06	1.1E-06
	NP-237	5.8E-01	4.3E-07	2.5E-07	2.7E-07
	PU-238	4.6E-01	2.8E-11	1.3E-11	2.1E-08
	PU-239/240	1.1E-01	2.7E-11	2.9E-12	5.1E-09
	RA-226	1.5E+00	6.0E-06	9.2E-06	9.3E-06
	RA-228	1.3E+00	2.9E-06	3.8E-06	3.8E-06
	SR-90	6.3E-01			2.5E-09
	TH-228	2.3E+00	5.6E-06	1.3E-05	1.3E-05
	TH-230	3.6E+01	5.4E-11	1.9E-09	6.4E-07
	TH-232	1.0E+00	8.5E-06	8.9E-06	9.0E-06
	U-234	1.7E+01	3.0E-11	5.0E-10	2.8E-07
	U-235/236	1.4E+00	2.4E-07	3.3E-07	3.6E-07
	U-238	5.7E+01	3.6E-08	2.1E-06	3.9E-06
Total Pathway:			Total Pathway:		3.9E-05

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	1.0E-08	1.0E+01	1.0E-07					1.2E-07
Arsenic	2.0E-08	1.8E+00	3.7E-08					6.8E-07
Benzo(a)pyrene			3.9E-07					7.9E-07
Benzo(a)anthracene			3.3E-08					6.5E-08
Benzo(b)fluoranthene			3.6E-08					7.2E-08
Benzo(g,h,i)perylene	5.3E-07							
bis(2-Ethylhexyl)phthalate	1.1E-07	1.4E-02	1.6E-09					8.4E-09
Beryllium	4.3E-08		3.2E-07					6.4E-07
Lead	7.8E-07							
Dibenzo(a,h)anthracene			1.1E-07	Not applicable				2.3E-07
Indeno(1,2,3-cd)pyrene			2.6E-08					5.2E-08
Phenanthrene	1.4E-06							
TH-TOTAL	7.1E-07							
U-TOTAL	6.0E-06							
Total Pathway:			1.1E-06	Total Pathway:				

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.1E-06 3.9E-05 *Total:* 4.5E-05

TABLE B.3.5-9

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.83E-05	3.2E-01		
NP-237	1.87E-05	3.3E-01		
PU-238	1.50E-05	2.6E-01		
PU-239/240	3.51E-06	6.1E-02		
RA-226	4.99E-05	8.7E-01		
RA-228	4.26E-05	7.5E-01		
SR-90	2.04E-05	3.6E-01		
TH-228	7.57E-05	1.3E+00		
TH-230	1.16E-03	2.0E+01		
TH-232	3.40E-05	6.0E-01		
U-234	5.46E-04	9.6E+00		
U-235/236	4.53E-05	7.9E-01		
U-238	1.86E-03	3.3E+01		
		Total Pathway:		

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	7.02E-01	6.1E+01		
NP-237	7.20E-01	6.3E+01		
PU-238	5.76E-01	5.0E+01		
PU-239/240	1.35E-01	1.2E+01		
RA-226	1.92E+00	1.7E+02		
RA-228	1.64E+00	1.4E+02		
SR-90	7.85E-01	6.9E+01		
TH-228	2.91E+00	2.5E+02		
TH-230	4.48E+01	3.9E+03		
TH-232	1.31E+00	1.1E+02		
U-234	2.10E+01	1.8E+03		
U-235/236	1.74E+00	1.5E+02		
U-238	7.14E+01	6.2E+03		
		Total Pathway:		

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.53E-09	4.2E-11		
Arsenic	1.87E-07	5.1E-09		
Benzo(a)pyrene	2.86E-08	7.8E-10		
Benzo(a)anthracene	2.37E-08	6.5E-10		
Benzo(b)fluoranthene	2.60E-08	7.1E-10		
Benzo(g,h,i)perylene	1.61E-08	4.4E-10		
bis(2-Ethylhexyl)phthalate	2.60E-07	7.1E-09		
Beryllium	3.95E-08	1.1E-09		
Lead	7.17E-07	2.0E-08		
Dibenzo(a,h)anthracene	8.32E-09	2.3E-10		
Indeno(1,2,3-cd)pyrene	1.87E-08	5.1E-10		
Phenanthrene	4.10E-08	1.1E-09		
TH-TOTAL	6.43E-07	1.8E-08		
U-TOTAL	5.57E-06	1.5E-07		
		Total Pathway:		

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	5.90E-02	8.1E-09		
Arsenic	7.19E+00	9.8E-07	3.0E-04	3.3E-03
Benzo(a)pyrene	1.10E+00	1.5E-07		
Benzo(a)anthracene	9.10E-01	1.2E-07		
Benzo(b)fluoranthene	1.00E+00	1.4E-07		
Benzo(g,h,i)perylene	6.30E-01	8.6E-08		
bis(2-Ethylhexyl)phthalate	1.00E+01	1.4E-06	2.0E-02	6.8E-05
Beryllium	1.52E+00	2.1E-07	5.0E-03	4.2E-05
Lead	2.76E+01	3.8E-06		
Dibenzo(a,h)anthracene	3.20E-01	4.4E-08		
Indeno(1,2,3-cd)pyrene	7.20E-01	9.9E-08		
Phenanthrene	1.60E+00	2.2E-07		
TH-TOTAL	2.51E+01	3.4E-06		
U-TOTAL	2.14E+02	2.9E-05	3.0E-03	9.8E-03
		Total Pathway:		1.3E-02

Total Rad + Chem

Total Rad + Chem 1.3E-02

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TABLE B.3.5-9
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	5.6E-01		
	NP-237	5.8E-01		
	PU-238	4.6E-01		
	PU-239/240	1.1E-01		
	RA-226	1.5E+00		
	RA-228	1.3E+00		
	SR-90	6.3E-01		
	TH-228	2.3E+00		
	TH-230	3.6E+01		
	TH-232	1.0E+00		
	U-234	1.7E+01		
	U-235/236	1.4E+00		
	U-238	5.7E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Aroclor-1254	2.8E-08							
Arsenic	5.7E-08	2.9E-04	2.0E-04					3.5E-03
Benzo(a)pyrene								
Benzo(a)anthracene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.5E-06							
bis(2-Ethylhexyl)phthalate	3.2E-07	2.0E-02	1.6E-05					8.4E-05
Beryllium	1.2E-07	5.0E-05	2.4E-03					2.4E-03
Lead	2.2E-06							
Dibenzo(a,h)anthracene				Not applicable				
Indeno(1,2,3-cd)pyrene								
Phenanthrene	3.8E-06							
TH-TOTAL	2.0E-06							
U-TOTAL	1.7E-05	1.5E-04	1.1E-01					1.2E-01
Total Pathway:			1.2E-01	Total Pathway:				

Total Rad + Chem 1.2E-01

Total: 1.3E-01

TABLE B.3.5-10(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.24E-07	1.4E-02	1.9E-11	2.7E-13	2.7E-13
NP-237	1.28E-07	1.5E-02	2.9E-08	4.3E-10	4.3E-10
PU-238	1.02E-07	1.2E-02	3.9E-08	4.6E-10	4.6E-10
PU-239/240	2.39E-08	2.8E-03	3.8E-08	1.1E-10	1.1E-10
RA-226	3.40E-07	3.9E-02	7.0E-09	2.8E-10	2.8E-10
RA-228	2.90E-07	3.4E-02	6.9E-10	2.3E-11	2.3E-11
SR-90	1.39E-07	1.6E-02	6.2E-11	1.0E-12	1.0E-12
TH-228	5.15E-07	6.0E-02	7.8E-08	4.7E-09	4.7E-09
TH-230	7.93E-06	9.2E-01	2.9E-08	2.7E-08	2.7E-08
TH-232	2.31E-07	2.7E-02	1.1E-07	2.9E-09	2.9E-09
U-234	3.72E-06	4.3E-01	2.6E-08	1.1E-08	1.1E-08
U-235/236	3.09E-07	3.6E-02	2.5E-08	9.0E-10	9.0E-10
U-238	1.26E-05	1.5E+00	5.2E-08	7.6E-08	7.6E-08
			Total Pathway:	1.2E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.04E-11	6.7E-13			
Arsenic	1.27E-09	8.2E-11	1.5E+01	1.2E-09	1.2E-09
Benzo(a)pyrene	1.95E-10	1.3E-11	6.1E+00	7.7E-11	7.7E-11
Benzo(a)anthracene	1.61E-10	1.0E-11	6.1E-01	6.4E-12	6.4E-12
Benzo(b)fluoranthene	1.77E-10	1.1E-11	6.1E-01	7.0E-12	7.0E-12
Benzo(g,h,i)perylene	1.11E-10	7.2E-12			
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10			
Beryllium	2.69E-10	1.7E-11	8.4E+00	1.5E-10	1.5E-10
Lead	4.88E-09	3.2E-10			
Dibenzo(a,h)anthracene	5.67E-11	3.7E-12	6.1E+00	2.2E-11	2.2E-11
Indeno(1,2,3-cd)pyrene	1.28E-10	8.3E-12	6.1E-01	5.1E-12	5.1E-12
Phenanthrene	2.83E-13	1.8E-14			
TH-TOTAL	4.44E-09	2.9E-10			
U-TOTAL	3.80E-08	2.5E-09			
			Total Pathway:	1.5E-09	

Total Rad + Chem 1.3E-07 *Total:* 1.3E-07

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TABLE B.3.5-10(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard					Total
Inhalation of Particulates/Soil					
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard	
CS-137	1.24E-07	1.4E-02			
NP-237	1.28E-07	1.5E-02			
PU-238	1.02E-07	1.2E-02			
PU-239/240	2.39E-08	2.8E-03			
RA-226	3.40E-07	3.9E-02			
RA-228	2.90E-07	3.4E-02			
SR-90	1.39E-07	1.6E-02			
TH-228	5.15E-07	6.0E-02			
TH-230	7.93E-06	9.2E-01			
TH-232	2.31E-07	2.7E-02			
U-234	3.72E-06	4.3E-01			
U-235/236	3.09E-07	3.6E-02			
U-238	1.26E-05	1.5E+00			
		Total Pathway:			

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.04E-11	6.7E-13		
Arsenic	1.27E-09	8.2E-11		
Benzo(a)pyrene	1.95E-10	1.3E-11		
Benzo(a)anthracene	1.61E-10	1.0E-11		
Benzo(b)fluoranthene	1.77E-10	1.1E-11		
Benzo(g,h,i)perylene	1.11E-10	7.2E-12		
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10		
Beryllium	2.69E-10	1.7E-11		
Lead	4.88E-09	3.2E-10		
Dibenzo(a,h)anthracene	5.67E-11	3.7E-12		
Indeno(1,2,3-cd)pyrene	1.28E-10	8.3E-12		
Phenanthrene	2.83E-13	1.8E-14		
TH-TOTAL	4.44E-09	2.9E-10		
U-TOTAL	3.80E-08	2.5E-09		
		Total Pathway:		

Total Rad + Chem | *Total:*

TABLE B.3.5-10(b)
FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.24E-07	2.6E-04	1.9E-11	4.9E-15	4.9E-15
NP-237	1.28E-07	2.7E-04	2.9E-08	7.8E-12	7.8E-12
PU-238	1.02E-07	2.1E-04	3.9E-08	8.4E-12	8.4E-12
PU-239/240	2.39E-08	5.0E-05	3.8E-08	1.9E-12	1.9E-12
RA-226	3.40E-07	7.1E-04	7.0E-09	5.0E-12	5.0E-12
RA-228	2.90E-07	6.1E-04	6.9E-10	4.2E-13	4.2E-13
SR-90	1.39E-07	2.9E-04	6.2E-11	1.8E-14	1.8E-14
TH-228	5.15E-07	1.1E-03	7.8E-08	8.4E-11	8.4E-11
TH-230	7.93E-06	1.7E-02	2.9E-08	4.8E-10	4.8E-10
TH-232	2.31E-07	4.9E-04	1.1E-07	5.3E-11	5.3E-11
U-234	3.72E-06	7.8E-03	2.6E-08	2.0E-10	2.0E-10
U-235/236	3.09E-07	6.5E-04	2.5E-08	1.6E-11	1.6E-11
U-238	1.26E-05	2.6E-02	5.2E-08	1.4E-09	1.4E-09
			Total Pathway:	2.2E-09	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.04E-11	5.7E-14			
Arsenic	1.27E-09	7.0E-12	1.5E+01	1.0E-10	1.0E-10
Benzo(a)pyrene	1.95E-10	1.1E-12	6.1E+00	6.5E-12	6.5E-12
Benzo(a)anthracene	1.61E-10	8.8E-13	6.1E-01	5.4E-13	5.4E-13
Benzo(b)fluoranthene	1.77E-10	9.7E-13	6.1E-01	5.9E-13	5.9E-13
Benzo(g,h,i)perylene	1.11E-10	6.1E-13			
bis(2-Ethylhexyl)phthalate	1.77E-09	9.7E-12			
Beryllium	2.69E-10	1.5E-12	8.4E+00	1.2E-11	1.2E-11
Lead	4.88E-09	2.7E-11			
Dibenzo(a,h)anthracene	5.67E-11	3.1E-13	6.1E+00	1.9E-12	1.9E-12
Indeno(1,2,3-cd)pyrene	1.28E-10	7.0E-13	6.1E-01	4.3E-13	4.3E-13
Phenanthrene	2.83E-13	1.6E-15			
TH-TOTAL	4.44E-09	2.4E-11			
U-TOTAL	3.80E-08	2.1E-10			
			Total Pathway:	1.3E-10	

Total Rad + Chem 2.4E-09 *Total:* 2.4E-09

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TABLE B.3.5-10(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.24E-07	2.6E-04		
NP-237	1.28E-07	2.7E-04		
PU-238	1.02E-07	2.1E-04		
PU-239/240	2.39E-08	5.0E-05		
RA-226	3.40E-07	7.1E-04		
RA-228	2.90E-07	6.1E-04		
SR-90	1.39E-07	2.9E-04		
TH-228	5.15E-07	1.1E-03		
TH-230	7.93E-06	1.7E-02		
TH-232	2.31E-07	4.9E-04		
U-234	3.72E-06	7.8E-03		
U-235/236	3.09E-07	6.5E-04		
U-238	1.26E-05	2.6E-02		
			Total Pathway:	

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.04E-11	6.6E-13		
Arsenic	1.27E-09	8.1E-11		
Benzo(a)pyrene	1.95E-10	1.2E-11		
Benzo(a)anthracene	1.61E-10	1.0E-11		
Benzo(b)fluoranthene	1.77E-10	1.1E-11		
Benzo(g,h,i)perylene	1.11E-10	7.1E-12		
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10		
Beryllium	2.69E-10	1.7E-11		
Lead	4.88E-09	3.1E-10		
Dibenzo(a,h)anthracene	5.67E-11	3.6E-12		
Indeno(1,2,3-cd)pyrene	1.28E-10	8.2E-12		
Phenanthrene	2.83E-13	1.8E-14		
TH-TOTAL	4.44E-09	2.8E-10		
U-TOTAL	3.80E-08	2.4E-09		
			Total Pathway:	

Total

Total Rad + Chem

Total:

TABLE B.3.5-10(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.24E-07	1.4E-02	1.9E-11	2.7E-13	2.7E-13
NP-237	1.28E-07	1.5E-02	2.9E-08	4.3E-10	4.3E-10
PU-238	1.02E-07	1.2E-02	3.9E-08	4.6E-10	4.6E-10
PU-239/240	2.39E-08	2.8E-03	3.8E-08	1.1E-10	1.1E-10
RA-226	3.40E-07	3.9E-02	7.0E-09	2.8E-10	2.8E-10
RA-228	2.90E-07	3.4E-02	6.9E-10	2.3E-11	2.3E-11
SR-90	1.39E-07	1.6E-02	6.2E-11	1.0E-12	1.0E-12
TH-228	5.15E-07	6.0E-02	7.8E-08	4.7E-09	4.7E-09
TH-230	7.93E-06	9.2E-01	2.9E-08	2.7E-08	2.7E-08
TH-232	2.31E-07	2.7E-02	1.1E-07	2.9E-09	2.9E-09
U-234	3.72E-06	4.3E-01	2.6E-08	1.1E-08	1.1E-08
U-235/236	3.09E-07	3.6E-02	2.5E-08	9.0E-10	9.0E-10
U-238	1.26E-05	1.5E+00	5.2E-08	7.6E-08	7.6E-08
			Total Pathway:	1.2E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.04E-11	6.7E-13			
Arsenic	1.27E-09	8.2E-11	1.5E+01	1.2E-09	1.2E-09
Benzo(a)pyrene	1.95E-10	1.3E-11	6.1E+00	7.7E-11	7.7E-11
Benzo(a)anthracene	1.61E-10	1.0E-11	6.1E-01	6.4E-12	6.4E-12
Benzo(b)fluoranthene	1.77E-10	1.1E-11	6.1E-01	7.0E-12	7.0E-12
Benzo(g,h,i)perylene	1.11E-10	7.2E-12			
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10			
Beryllium	2.69E-10	1.7E-11	8.4E+00	1.5E-10	1.5E-10
Lead	4.88E-09	3.2E-10			
Dibenzo(a,h)anthracene	5.67E-11	3.7E-12	6.1E+00	2.2E-11	2.2E-11
Indeno(1,2,3-cd)pyrene	1.28E-10	8.3E-12	6.1E-01	5.1E-12	5.1E-12
Phenanthrene	2.83E-13	1.8E-14			
TH-TOTAL	4.44E-09	2.9E-10			
U-TOTAL	3.80E-08	2.5E-09			
			Total Pathway:	1.5E-09	

Total Rad + Chem 1.3E-07 *Total:* 1.3E-07

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TABLE B.3.5-10(c)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.24E-07	1.4E-02		
NP-237	1.28E-07	1.5E-02		
PU-238	1.02E-07	1.2E-02		
PU-239/240	2.39E-08	2.8E-03		
RA-226	3.40E-07	3.9E-02		
RA-228	2.90E-07	3.4E-02		
SR-90	1.39E-07	1.6E-02		
TH-228	5.15E-07	6.0E-02		
TH-230	7.93E-06	9.2E-01		
TH-232	2.31E-07	2.7E-02		
U-234	3.72E-06	4.3E-01		
U-235/236	3.09E-07	3.6E-02		
U-238	1.26E-05	1.5E+00		
		Total Pathway:		

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.04E-11	6.7E-13		
Arsenic	1.27E-09	8.2E-11		
Benzo(a)pyrene	1.95E-10	1.3E-11		
Benzo(a)anthracene	1.61E-10	1.0E-11		
Benzo(b)fluoranthene	1.77E-10	1.1E-11		
Benzo(g,h,i)perylene	1.11E-10	7.2E-12		
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10		
Beryllium	2.69E-10	1.7E-11		
Lead	4.88E-09	3.2E-10		
Dibenzo(a,h)anthracene	5.67E-11	3.7E-12		
Indeno(1,2,3-cd)pyrene	1.28E-10	8.3E-12		
Phenanthrene	2.83E-13	1.8E-14		
TH-TOTAL	4.44E-09	2.9E-10		
U-TOTAL	3.80E-08	2.5E-09		
		Total Pathway:		

Total Rad + Chem

Total

Total:

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TABLE B.3.5-10(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.24E-07	2.6E-04	1.9E-11	4.9E-15	4.9E-15
NP-237	1.28E-07	2.7E-04	2.9E-08	7.8E-12	7.8E-12
PU-238	1.02E-07	2.1E-04	3.9E-08	8.4E-12	8.4E-12
PU-239/240	2.39E-08	5.0E-05	3.8E-08	1.9E-12	1.9E-12
RA-226	3.40E-07	7.1E-04	7.0E-09	5.0E-12	5.0E-12
RA-228	2.90E-07	6.1E-04	6.9E-10	4.2E-13	4.2E-13
SR-90	1.39E-07	2.9E-04	6.2E-11	1.8E-14	1.8E-14
TH-228	5.15E-07	1.1E-03	7.8E-08	8.4E-11	8.4E-11
TH-230	7.93E-06	1.7E-02	2.9E-08	4.8E-10	4.8E-10
TH-232	2.31E-07	4.9E-04	1.1E-07	5.3E-11	5.3E-11
U-234	3.72E-06	7.8E-03	2.6E-08	2.0E-10	2.0E-10
U-235/236	3.09E-07	6.5E-04	2.5E-08	1.6E-11	1.6E-11
U-238	1.26E-05	2.6E-02	5.2E-08	1.4E-09	1.4E-09
			Total Pathway:	2.2E-09	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.04E-11	5.7E-14			
Arsenic	1.27E-09	7.0E-12	1.5E+01	1.0E-10	1.0E-10
Benzo(a)pyrene	1.95E-10	1.1E-12	6.1E+00	6.5E-12	6.5E-12
Benzo(a)anthracene	1.61E-10	8.8E-13	6.1E-01	5.4E-13	5.4E-13
Benzo(b)fluoranthene	1.77E-10	9.7E-13	6.1E-01	5.9E-13	5.9E-13
Benzo(g,h,i)perylene	1.11E-10	6.1E-13			
bis(2-Ethylhexyl)phthalate	1.77E-09	9.7E-12			
Beryllium	2.69E-10	1.5E-12	8.4E+00	1.2E-11	1.2E-11
Lead	4.88E-09	2.7E-11			
Dibenzo(a,h)anthracene	5.67E-11	3.1E-13	6.1E+00	1.9E-12	1.9E-12
Indeno(1,2,3-cd)pyrene	1.28E-10	7.0E-13	6.1E-01	4.3E-13	4.3E-13
Phenanthrene	2.83E-13	1.6E-15			
TH-TOTAL	4.44E-09	2.4E-11			
U-TOTAL	3.80E-08	2.1E-10			
			Total Pathway:	1.3E-10	

Total Rad + Chem 2.4E-09 *Total:* 2.4E-09

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TABLE B.3.5-10(d)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.24E-07	2.6E-04		
NP-237	1.28E-07	2.7E-04		
PU-238	1.02E-07	2.1E-04		
PU-239/240	2.39E-08	5.0E-05		
RA-226	3.40E-07	7.1E-04		
RA-228	2.90E-07	6.1E-04		
SR-90	1.39E-07	2.9E-04		
TH-228	5.15E-07	1.1E-03		
TH-230	7.93E-06	1.7E-02		
TH-232	2.31E-07	4.9E-04		
U-234	3.72E-06	7.8E-03		
U-235/236	3.09E-07	6.5E-04		
U-238	1.26E-05	2.6E-02		

Total Pathway:

Total

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.04E-11	6.6E-13		
Arsenic	1.27E-09	8.1E-11		
Benzo(a)pyrene	1.95E-10	1.2E-11		
Benzo(a)anthracene	1.61E-10	1.0E-11		
Benzo(b)fluoranthene	1.77E-10	1.1E-11		
Benzo(g,h,i)perylene	1.11E-10	7.1E-12		
bis(2-Ethylhexyl)phthalate	1.77E-09	1.1E-10		
Beryllium	2.69E-10	1.7E-11		
Lead	4.88E-09	3.1E-10		
Dibenzo(a,h)anthracene	5.67E-11	3.6E-12		
Indeno(1,2,3-cd)pyrene	1.28E-10	8.2E-12		
Phenanthrene	2.83E-13	1.8E-14		
TH-TOTAL	4.44E-09	2.8E-10		
U-TOTAL	3.80E-08	2.4E-09		

Total Pathway:

Total Rad + Chem

Total:

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TABLE B.3.5-11(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.80E-04	5.1E-01	2.8E-11	1.4E-11	CS-137	9.80E-05	7.2E-01	2.8E-11	2.0E-11	3.5E-11
NP-237	3.46E-07	6.4E-04	2.2E-10	1.4E-13	NP-237	3.14E-08	2.3E-04	2.2E-10	5.1E-14	1.9E-13
PU-238	2.59E-09	4.8E-06	2.2E-10	1.0E-15	PU-238	5.18E-10	3.8E-06	2.2E-10	8.4E-16	1.9E-15
PU-239/240	6.50E-10	1.2E-06	2.3E-10	2.7E-16	PU-239/240	1.30E-10	9.6E-07	2.3E-10	2.2E-16	4.9E-16
RA-226	6.07E-06	1.1E-02	7.8E-10	8.7E-12	RA-226	1.09E-05	8.0E-02	7.8E-10	6.3E-11	7.1E-11
RA-228	3.31E-06	6.1E-03	1.0E-10	6.1E-13	RA-228	5.95E-06	4.4E-02	1.0E-10	4.4E-12	5.0E-12
SR-90	4.69E-06	8.6E-03	3.6E-11	3.1E-13	SR-90	2.34E-05	1.7E-01	3.6E-11	6.2E-12	6.5E-12
TH-228	1.28E-07	2.3E-04	5.5E-11	1.3E-14	TH-228	1.07E-07	7.8E-04	5.5E-11	4.3E-14	5.6E-14
TH-230	9.57E-06	1.8E-02	1.3E-11	2.3E-13	TH-230	7.98E-06	5.9E-02	1.3E-11	7.6E-13	9.9E-13
TH-232	2.80E-07	5.1E-04	1.7E-10	8.7E-14	TH-232	2.33E-07	1.7E-03	1.7E-10	2.9E-13	3.8E-13
U-234	3.21E-05	5.9E-02	1.6E-11	9.4E-13	U-234	9.64E-05	7.1E-01	1.6E-11	1.1E-11	1.2E-11
U-235/236	2.67E-06	4.9E-03	1.6E-11	7.8E-14	U-235/236	8.01E-06	5.9E-02	1.6E-11	9.4E-13	1.0E-12
U-238	1.09E-04	2.0E-01	2.8E-11	5.6E-12	U-238	3.27E-04	2.4E+00	2.8E-11	6.7E-11	7.3E-11
			Total Pathway:	3.1E-11				Total Pathway:	1.7E-10	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	9.2E-08	9.4E-11	7.7E+00	7.3E-10	Aroclor-1254	2.9E-08	1.2E-10	7.7E+00	9.2E-10	1.6E-09
Arsenic	3.9E-07	4.0E-10	1.8E+00	7.0E-10	Arsenic	1.2E-08	4.8E-11	1.8E+00	8.4E-11	7.8E-10
Benzo(a)pyrene	2.9E-07	3.0E-10	7.3E+00	2.2E-09	Benzo(a)pyrene	9.2E-08	3.8E-10	7.3E+00	2.7E-09	4.9E-09
Benzo(a)anthracene	9.0E-08	9.3E-11	7.3E-01	6.8E-11	Benzo(a)anthracene	2.9E-08	1.2E-10	7.3E-01	8.6E-11	1.5E-10
Benzo(b)fluoranthene	2.7E-07	2.8E-10	7.3E-01	2.0E-10	Benzo(b)fluoranthene	8.5E-08	3.5E-10	7.3E-01	2.6E-10	4.6E-10
Benzo(g,h,i)perylene	2.1E-06	2.2E-09			Benzo(g,h,i)perylene	6.7E-07	2.8E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	1.4E-08	1.4E-02	1.9E-10	bis(2-Ethylhexyl)phthalate	4.2E-06	1.7E-08	1.4E-02	2.4E-10	4.3E-10
Beryllium	2.6E-08	2.7E-11	4.3E+00	1.2E-10	Beryllium	2.4E-11	9.8E-14	4.3E+00	4.2E-13	1.2E-10
Lead	9.7E-08	9.9E-11			Lead	8.1E-08	3.3E-10			
Dibenzo(a,h)anthracene	4.6E-07	4.7E-10	7.3E+00	3.4E-09	Dibenzo(a,h)anthracene	1.5E-07	6.0E-10	7.3E+00	4.4E-09	7.8E-09
Indeno(1,2,3-cd)pyrene	5.6E-07	5.8E-10	7.3E-01	4.2E-10	Indeno(1,2,3-cd)pyrene	1.8E-07	7.3E-10	7.3E-01	5.3E-10	9.5E-10
Phenanthrene	1.2E-11	1.2E-14			Phenanthrene	3.8E-12	1.5E-14			
TH-TOTAL	5.4E-09	5.5E-12			TH-TOTAL	4.5E-09	1.8E-11			
U-TOTAL	4.4E-07	4.5E-10			U-TOTAL	1.3E-06	5.5E-09			
			Total Pathway:	8.0E-09				Total Pathway:	9.2E-09	
			Total Rad + Chem	8.1E-09				Total Rad + Chem	9.4E-09	*Total:* 1.7E-08

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TABLE B.3.5-11(a)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.8E-04	5.1E-01			CS-137	9.80E-05	7.2E-01			
NP-237	3.5E-07	6.4E-04			NP-237	3.14E-08	2.3E-04			
PU-238	2.6E-09	4.8E-06			PU-238	5.18E-10	3.8E-06			
PU-239/240	6.5E-10	1.2E-06			PU-239/240	1.30E-10	9.6E-07			
RA-226	6.1E-06	1.1E-02			RA-226	1.09E-05	8.0E-02			
RA-228	3.3E-06	6.1E-03			RA-228	5.95E-06	4.4E-02			
SR-90	4.7E-06	8.6E-03			SR-90	2.34E-05	1.7E-01			
TH-228	1.3E-07	2.3E-04			TH-228	1.07E-07	7.8E-04			
TH-230	9.6E-06	1.8E-02			TH-230	7.98E-06	5.9E-02			
TH-232	2.8E-07	5.1E-04			TH-232	2.33E-07	1.7E-03			
U-234	3.2E-05	5.9E-02			U-234	9.64E-05	7.1E-01			
U-235/236	2.7E-06	4.9E-03			U-235/236	8.01E-06	5.9E-02			
U-238	1.1E-04	2.0E-01			U-238	3.27E-04	2.4E+00			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	9.2E-08	9.4E-11			Aroclor-1254	2.9E-08	1.2E-10			
Arsenic	3.9E-07	4.0E-10	3.0E-04	1.3E-06	Arsenic	1.2E-08	4.8E-11	3.0E-04	1.6E-07	1.5E-06
Benzo(a)pyrene	2.9E-07	3.0E-10			Benzo(a)pyrene	9.2E-08	3.8E-10			
Benzo(a)anthracene	9.0E-08	9.3E-11			Benzo(a)anthracene	2.9E-08	1.2E-10			
Benzo(b)fluoranthene	2.7E-07	2.8E-10			Benzo(b)fluoranthene	8.5E-08	3.5E-10			
Benzo(g,h,i)perylene	2.1E-06	2.2E-09			Benzo(g,h,i)perylene	6.7E-07	2.8E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	1.4E-08	2.0E-02	6.8E-07	bis(2-Ethylhexyl)phthalate	4.2E-06	1.7E-08	2.0E-02	8.6E-07	1.5E-06
Beryllium	2.6E-08	2.7E-11	5.0E-03	5.4E-09	Beryllium	2.4E-11	9.8E-14	5.0E-03	2.0E-11	5.4E-09
Lead	9.7E-08	9.9E-11			Lead	8.1E-08	3.3E-10			
Dibenzo(a,h)anthracene	4.6E-07	4.7E-10			Dibenzo(a,h)anthracene	1.5E-07	6.0E-10			
Indeno(1,2,3-cd)pyrene	5.6E-07	5.8E-10			Indeno(1,2,3-cd)pyrene	1.8E-07	7.3E-10			
Phenanthrene	1.2E-11	1.2E-14			Phenanthrene	3.8E-12	1.5E-14			
TH-TOTAL	5.4E-09	5.5E-12			TH-TOTAL	4.5E-09	1.8E-11			
U-TOTAL	4.4E-07	4.5E-10	3.0E-03	1.5E-07	U-TOTAL	1.3E-06	5.5E-09	3.0E-03	1.8E-06	2.0E-06
			Total Pathway:	2.2E-06				Total Pathway:	2.8E-06	
			Total Rad + Chem	2.2E-06				Total Rad + Chem	2.8E-06	*Total:* 5.0E-06

TABLE B.3.5-11(a)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	5.94E-01	1.1E+03	1.3E-12	1.4E-09

Total Pathway: 1.4E-09

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	7.16E-01	5.3E+03	1.3E-12	6.8E-09

Total Pathway: 6.8E-09

Total	Total Dust & Groundwater Affected
	3.5E-11
	1.9E-13
	1.9E-15
	4.9E-16
	7.1E-11
	5.0E-12
	6.5E-12
	5.6E-14
	9.9E-13
	3.8E-13
	1.2E-11
	1.0E-12
	7.3E-11
8.3E-09	8.3E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.4E-09

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 6.8E-09

Total	Total Dust & Groundwater Affected
	1.6E-09
	7.8E-10
	4.9E-09
	1.5E-10
	4.6E-10
	4.3E-10
	1.2E-10
	7.8E-09
	9.5E-10
Total: 8.3E-09	2.6E-08

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TABLE B.3.5-11(a)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk						Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	Total	Dust & Groundwater Affected
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	5.9E-01	1.1E+03			TC-99	7.16E-01	5.3E+03				
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion of Beef					Ingestion/Milk						Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	Total	Dust & Groundwater Affected
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			1.5E-06
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02			1.5E-06
Beryllium			5.0E-03		Beryllium			5.0E-03			5.4E-09
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			2.0E-06
			Total Pathway:					Total Pathway:			
			Total Rad + Chem					Total Rad + Chem		*Total:*	5.0E-06

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TABLE B.3.5-11(b)
FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.80E-04	1.7E-02	2.8E-11	4.8E-13	CS-137	9.80E-05	1.4E-01	2.8E-11	3.9E-12	4.4E-12
NP-237	3.46E-07	2.1E-05	2.2E-10	4.6E-15	NP-237	3.14E-08	4.5E-05	2.2E-10	9.9E-15	1.5E-14
PU-238	2.59E-09	1.6E-07	2.2E-10	3.5E-17	PU-238	5.18E-10	7.4E-07	2.2E-10	1.6E-16	2.0E-16
PU-239/240	6.50E-10	4.0E-08	2.3E-10	9.1E-18	PU-239/240	1.30E-10	1.9E-07	2.3E-10	4.3E-17	5.2E-17
RA-226	6.07E-06	3.7E-04	7.8E-10	2.9E-13	RA-226	1.09E-05	1.6E-02	7.8E-10	1.2E-11	1.2E-11
RA-228	3.31E-06	2.0E-04	1.0E-10	2.0E-14	RA-228	5.95E-06	8.5E-03	1.0E-10	8.5E-13	8.7E-13
SR-90	4.69E-06	2.9E-04	3.6E-11	1.0E-14	SR-90	2.34E-05	3.3E-02	3.6E-11	1.2E-12	1.2E-12
TH-228	1.28E-07	7.8E-06	5.5E-11	4.3E-16	TH-228	1.07E-07	1.5E-04	5.5E-11	8.4E-15	8.8E-15
TH-230	9.57E-06	5.8E-04	1.3E-11	7.6E-15	TH-230	7.98E-06	1.1E-02	1.3E-11	1.5E-13	1.6E-13
TH-232	2.80E-07	1.7E-05	1.7E-10	2.9E-15	TH-232	2.33E-07	3.3E-04	1.7E-10	5.7E-14	5.9E-14
U-234	3.21E-05	2.0E-03	1.6E-11	3.1E-14	U-234	9.64E-05	1.4E-01	1.6E-11	2.2E-12	2.2E-12
U-235/236	2.67E-06	1.6E-04	1.6E-11	2.6E-15	U-235/236	8.01E-06	1.1E-02	1.6E-11	1.8E-13	1.9E-13
U-238	1.09E-04	6.6E-03	2.8E-11	1.9E-13	U-238	3.27E-04	4.7E-01	2.8E-11	1.3E-11	1.3E-11
			Total Pathway:	1.0E-12				Total Pathway:	3.4E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	9.2E-08	1.5E-11	7.7E+00	1.1E-10	Aroclor-1254	2.9E-08	1.1E-10	7.7E+00	8.3E-10	9.5E-10
Arsenic	3.9E-07	6.2E-11	1.8E+00	1.1E-10	Arsenic	1.2E-08	4.4E-11	1.8E+00	7.6E-11	1.8E-10
Benzo(a)pyrene	2.9E-07	4.6E-11	7.3E+00	3.4E-10	Benzo(a)pyrene	9.2E-08	3.4E-10	7.3E+00	2.5E-09	2.8E-09
Benzo(a)anthracene	9.0E-08	1.4E-11	7.3E-01	1.0E-11	Benzo(a)anthracene	2.9E-08	1.1E-10	7.3E-01	7.8E-11	8.8E-11
Benzo(b)fluoranthene	2.7E-07	4.3E-11	7.3E-01	3.1E-11	Benzo(b)fluoranthene	8.5E-08	3.2E-10	7.3E-01	2.3E-10	2.6E-10
Benzo(g,h,i)perylene	2.1E-06	3.4E-10			Benzo(g,h,i)perylene	6.7E-07	2.5E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	2.1E-09	1.4E-02	3.0E-11	bis(2-Ethylhexyl)phthalate	4.2E-06	1.6E-08	1.4E-02	2.2E-10	2.5E-10
Beryllium	2.6E-08	4.2E-12	4.3E+00	1.8E-11	Beryllium	2.4E-11	8.8E-14	4.3E+00	3.8E-13	1.8E-11
Lead	9.7E-08	1.5E-11			Lead	8.1E-08	3.0E-10			
Dibenzo(a,h)anthracene	4.6E-07	7.3E-11	7.3E+00	5.3E-10	Dibenzo(a,h)anthracene	1.5E-07	5.4E-10	7.3E+00	3.9E-09	4.5E-09
Indeno(1,2,3-cd)pyrene	5.6E-07	8.9E-11	7.3E-01	6.5E-11	Indeno(1,2,3-cd)pyrene	1.8E-07	6.6E-10	7.3E-01	4.8E-10	5.5E-10
Phenanthrene	1.2E-11	1.9E-15			Phenanthrene	3.8E-12	1.4E-14			
TH-TOTAL	5.4E-09	8.5E-13			TH-TOTAL	4.5E-09	1.7E-11			
U-TOTAL	4.4E-07	7.0E-11			U-TOTAL	1.3E-06	4.9E-09			
			Total Pathway:	1.2E-09				Total Pathway:	8.4E-09	
			Total Rad + Chem	1.2E-09				Total Rad + Chem	8.4E-09	*Total:* 9.6E-09

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TABLE B.3.5-11(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.8E-04	1.7E-02			CS-137	9.80E-05	1.4E-01			
NP-237	3.5E-07	2.1E-05			NP-237	3.14E-08	4.5E-05			
PU-238	2.6E-09	1.6E-07			PU-238	5.18E-10	7.4E-07			
PU-239/240	6.5E-10	4.0E-08			PU-239/240	1.30E-10	1.9E-07			
RA-226	6.1E-06	3.7E-04			RA-226	1.09E-05	1.6E-02			
RA-228	3.3E-06	2.0E-04			RA-228	5.95E-06	8.5E-03			
SR-90	4.7E-06	2.9E-04			SR-90	2.34E-05	3.3E-02			
TH-228	1.3E-07	7.8E-06			TH-228	1.07E-07	1.5E-04			
TH-230	9.6E-06	5.8E-04			TH-230	7.98E-06	1.1E-02			
TH-232	2.8E-07	1.7E-05			TH-232	2.33E-07	3.3E-04			
U-234	3.2E-05	2.0E-03			U-234	9.64E-05	1.4E-01			
U-235/236	2.7E-06	1.6E-04			U-235/236	8.01E-06	1.1E-02			
U-238	1.1E-04	6.6E-03			U-238	3.27E-04	4.7E-01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	9.2E-08	1.7E-10			Aroclor-1254	2.9E-08	1.3E-09			
Arsenic	3.9E-07	7.2E-10	3.0E-04	2.4E-06	Arsenic	1.2E-08	5.1E-10	3.0E-04	1.7E-06	4.1E-06
Benzo(a)pyrene	2.9E-07	5.4E-10			Benzo(a)pyrene	9.2E-08	4.0E-09			
Benzo(a)anthracene	9.0E-08	1.7E-10			Benzo(a)anthracene	2.9E-08	1.2E-09			
Benzo(b)fluoranthene	2.7E-07	5.0E-10			Benzo(b)fluoranthene	8.5E-08	3.7E-09			
Benzo(g,h,i)perylene	2.1E-06	3.9E-09			Benzo(g,h,i)perylene	6.7E-07	2.9E-08			
bis(2-Ethylhexyl)phthalate	1.3E-05	2.5E-08	2.0E-02	1.2E-06	bis(2-Ethylhexyl)phthalate	4.2E-06	1.8E-07	2.0E-02	9.1E-06	1.0E-05
Beryllium	2.6E-08	4.9E-11	5.0E-03	9.8E-09	Beryllium	2.4E-11	1.0E-12	5.0E-03	2.1E-10	1.0E-08
Lead	9.7E-08	1.8E-10			Lead	8.1E-08	3.5E-09			
Dibenzo(a,h)anthracene	4.6E-07	8.5E-10			Dibenzo(a,h)anthracene	1.5E-07	6.3E-09			
Indeno(1,2,3-cd)pyrene	5.6E-07	1.0E-09			Indeno(1,2,3-cd)pyrene	1.8E-07	7.7E-09			
Phenanthrene	1.2E-11	2.2E-14			Phenanthrene	3.8E-12	1.6E-13			
TH-TOTAL	5.4E-09	1.0E-11			TH-TOTAL	4.5E-09	1.9E-10			
U-TOTAL	4.4E-07	8.2E-10	3.0E-03	2.7E-07	U-TOTAL	1.3E-06	5.8E-08	3.0E-03	1.9E-05	2.0E-05
			Total Pathway:	3.9E-06				Total Pathway:	3.0E-05	
			Total Rad + Chem	3.9E-06				Total Rad + Chem	3.0E-05	*Total:* 3.4E-05

TABLE B.3.5-11(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	5.94E-01	3.6E+01	1.3E-12	4.7E-11

Total Pathway: 4.7E-11

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	7.16E-01	1.0E+03	1.3E-12	1.3E-09

Total Pathway: 1.3E-09

Total	Total Dust & Groundwater Affected
	4.4E-12
	1.5E-14
	2.0E-16
	5.2E-17
	1.2E-11
	8.7E-13
	1.2E-12
	8.8E-15
	1.6E-13
	5.9E-14
	2.2E-12
	1.9E-13
	1.3E-11
1.4E-09	1.4E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 4.7E-11

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.3E-09

	9.5E-10	
	1.8E-10	
	2.8E-09	
	8.8E-11	
	2.6E-10	
	2.5E-10	
	1.8E-11	
	4.5E-09	
	5.5E-10	
Total: 1.4E-09	1.1E-08	

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TABLE B.3.5-11(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	5.9E-01	3.6E+01			TC-99	7.16E-01	1.0E+03				
Total Pathway:					Total Pathway:						

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			4.1E-06
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02			1.0E-05
Beryllium			5.0E-03		Beryllium			5.0E-03			1.0E-08
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			2.0E-05
Total Pathway:					Total Pathway:						
Total Rad + Chem					Total Rad + Chem					*Total:*	3.4E-05

TABLE B.3.5-11(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.80E-04	5.1E-01	2.8E-11	1.4E-11	CS-137	9.80E-05	7.2E-01	2.8E-11	2.0E-11	3.5E-11
NP-237	3.46E-07	6.4E-04	2.2E-10	1.4E-13	NP-237	3.14E-08	2.3E-04	2.2E-10	5.1E-14	1.9E-13
PU-238	2.59E-09	4.8E-06	2.2E-10	1.0E-15	PU-238	5.18E-10	3.8E-06	2.2E-10	8.4E-16	1.9E-15
PU-239/240	6.50E-10	1.2E-06	2.3E-10	2.7E-16	PU-239/240	1.30E-10	9.6E-07	2.3E-10	2.2E-16	4.9E-16
RA-226	6.07E-06	1.1E-02	7.8E-10	8.7E-12	RA-226	1.09E-05	8.0E-02	7.8E-10	6.3E-11	7.1E-11
RA-228	3.31E-06	6.1E-03	1.0E-10	6.1E-13	RA-228	5.95E-06	4.4E-02	1.0E-10	4.4E-12	5.0E-12
SR-90	4.69E-06	8.6E-03	3.6E-11	3.1E-13	SR-90	2.34E-05	1.7E-01	3.6E-11	6.2E-12	6.5E-12
TH-228	1.28E-07	2.3E-04	5.5E-11	1.3E-14	TH-228	1.07E-07	7.8E-04	5.5E-11	4.3E-14	5.6E-14
TH-230	9.57E-06	1.8E-02	1.3E-11	2.3E-13	TH-230	7.98E-06	5.9E-02	1.3E-11	7.6E-13	9.9E-13
TH-232	2.80E-07	5.1E-04	1.7E-10	8.7E-14	TH-232	2.33E-07	1.7E-03	1.7E-10	2.9E-13	3.8E-13
U-234	3.21E-05	5.9E-02	1.6E-11	9.4E-13	U-234	9.64E-05	7.1E-01	1.6E-11	1.1E-11	1.2E-11
U-235/236	2.67E-06	4.9E-03	1.6E-11	7.8E-14	U-235/236	8.01E-06	5.9E-02	1.6E-11	9.4E-13	1.0E-12
U-238	1.09E-04	2.0E-01	2.8E-11	5.6E-12	U-238	3.27E-04	2.4E+00	2.8E-11	6.7E-11	7.3E-11
			Total Pathway:	3.1E-11				Total Pathway:	1.7E-10	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	9.2E-08	9.4E-11	7.7E+00	7.3E-10	Aroclor-1254	2.9E-08	1.2E-10	7.7E+00	9.2E-10	1.6E-09
Arsenic	3.9E-07	4.0E-10	1.8E+00	7.0E-10	Arsenic	1.2E-08	4.8E-11	1.8E+00	8.4E-11	7.8E-10
Benzo(a)pyrene	2.9E-07	3.0E-10	7.3E+00	2.2E-09	Benzo(a)pyrene	9.2E-08	3.8E-10	7.3E+00	2.7E-09	4.9E-09
Benzo(a)anthracene	9.0E-08	9.3E-11	7.3E-01	6.8E-11	Benzo(a)anthracene	2.9E-08	1.2E-10	7.3E-01	8.6E-11	1.5E-10
Benzo(b)fluoranthene	2.7E-07	2.8E-10	7.3E-01	2.0E-10	Benzo(b)fluoranthene	8.5E-08	3.5E-10	7.3E-01	2.6E-10	4.6E-10
Benzo(g,h,i)perylene	2.1E-06	2.2E-09			Benzo(g,h,i)perylene	6.7E-07	2.8E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	1.4E-08	1.4E-02	1.9E-10	bis(2-Ethylhexyl)phthalate	4.2E-06	1.7E-08	1.4E-02	2.4E-10	4.3E-10
Beryllium	2.6E-08	2.7E-11	4.3E+00	1.2E-10	Beryllium	2.4E-11	9.8E-14	4.3E+00	4.2E-13	1.2E-10
Lead	9.7E-08	9.9E-11			Lead	8.1E-08	3.3E-10			
Dibenzo(a,h)anthracene	4.6E-07	4.7E-10	7.3E+00	3.4E-09	Dibenzo(a,h)anthracene	1.5E-07	6.0E-10	7.3E+00	4.4E-09	7.8E-09
Indeno(1,2,3-cd)pyrene	5.6E-07	5.8E-10	7.3E-01	4.2E-10	Indeno(1,2,3-cd)pyrene	1.8E-07	7.3E-10	7.3E-01	5.3E-10	9.5E-10
Phenanthrene	1.2E-11	1.2E-14			Phenanthrene	3.8E-12	1.5E-14			
TH-TOTAL	5.4E-09	5.5E-12			TH-TOTAL	4.5E-09	1.8E-11			
U-TOTAL	4.4E-07	4.5E-10			U-TOTAL	1.3E-06	5.5E-09			
			Total Pathway:	8.0E-09				Total Pathway:	9.2E-09	
			Total Rad + Chem	8.1E-09				Total Rad + Chem	9.4E-09	*Total:* 1.7E-08

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TABLE B.3.5-11(c)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.8E-04	5.1E-01			CS-137	9.80E-05	7.2E-01			
NP-237	3.5E-07	6.4E-04			NP-237	3.14E-08	2.3E-04			
PU-238	2.6E-09	4.8E-06			PU-238	5.18E-10	3.8E-06			
PU-239/240	6.5E-10	1.2E-06			PU-239/240	1.30E-10	9.6E-07			
RA-226	6.1E-06	1.1E-02			RA-226	1.09E-05	8.0E-02			
RA-228	3.3E-06	6.1E-03			RA-228	5.95E-06	4.4E-02			
SR-90	4.7E-06	8.6E-03			SR-90	2.34E-05	1.7E-01			
TH-228	1.3E-07	2.3E-04			TH-228	1.07E-07	7.8E-04			
TH-230	9.6E-06	1.8E-02			TH-230	7.98E-06	5.9E-02			
TH-232	2.8E-07	5.1E-04			TH-232	2.33E-07	1.7E-03			
U-234	3.2E-05	5.9E-02			U-234	9.64E-05	7.1E-01			
U-235/236	2.7E-06	4.9E-03			U-235/236	8.01E-06	5.9E-02			
U-238	1.1E-04	2.0E-01			U-238	3.27E-04	2.4E+00			
		Total Pathway:						Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	9.2E-08	9.4E-11			Aroclor-1254	2.9E-08	1.2E-10			
Arsenic	3.9E-07	4.0E-10	3.0E-04	1.3E-06	Arsenic	1.2E-08	4.8E-11	3.0E-04	1.6E-07	1.5E-06
Benzo(a)pyrene	2.9E-07	3.0E-10			Benzo(a)pyrene	9.2E-08	3.8E-10			
Benzo(a)anthracene	9.0E-08	9.3E-11			Benzo(a)anthracene	2.9E-08	1.2E-10			
Benzo(b)fluoranthene	2.7E-07	2.8E-10			Benzo(b)fluoranthene	8.5E-08	3.5E-10			
Benzo(g,h,i)perylene	2.1E-06	2.2E-09			Benzo(g,h,i)perylene	6.7E-07	2.8E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	1.4E-08	2.0E-02	6.8E-07	bis(2-Ethylhexyl)phthalate	4.2E-06	1.7E-08	2.0E-02	8.6E-07	1.5E-06
Beryllium	2.6E-08	2.7E-11	5.0E-03	5.4E-09	Beryllium	2.4E-11	9.8E-14	5.0E-03	2.0E-11	5.4E-09
Lead	9.7E-08	9.9E-11			Lead	8.1E-08	3.3E-10			
Dibenzo(a,h)anthracene	4.6E-07	4.7E-10			Dibenzo(a,h)anthracene	1.5E-07	6.0E-10			
Indeno(1,2,3-cd)pyrene	5.6E-07	5.8E-10			Indeno(1,2,3-cd)pyrene	1.8E-07	7.3E-10			
Phenanthrene	1.2E-11	1.2E-14			Phenanthrene	3.8E-12	1.5E-14			
TH-TOTAL	5.4E-09	5.5E-12			TH-TOTAL	4.5E-09	1.8E-11			
U-TOTAL	4.4E-07	4.5E-10	3.0E-03	1.5E-07	U-TOTAL	1.3E-06	5.5E-09	3.0E-03	1.8E-06	2.0E-06
		Total Pathway:		2.2E-06				Total Pathway:	2.8E-06	
		Total Rad + Chem		2.2E-06				Total Rad + Chem	2.8E-06	*Total:* 5.0E-06

TABLE B.3.5-11(c)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	5.94E-01	1.1E+03	1.3E-12	1.4E-09

Total Pathway: 1.4E-09

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	7.16E-01	5.3E+03	1.3E-12	6.8E-09

Total Pathway: 6.8E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.4E-09

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 6.8E-09

	Total	Total Dust & Groundwater Affected
CS-137		3.5E-11
NP-237		1.9E-13
PU-238		1.9E-15
PU-239/240		4.9E-16
RA-226		7.1E-11
RA-228		5.0E-12
SR-90		6.5E-12
TH-228		5.6E-14
TH-230		9.9E-13
TH-232		3.8E-13
U-234		1.2E-11
U-235/236		1.0E-12
U-238		7.3E-11
TC-99	8.3E-09	8.3E-09
Aroclor-1254		1.6E-09
Arsenic		7.8E-10
Benzo(a)pyrene		4.9E-09
Benzo(a)anthracene		1.5E-10
Benzo(b)fluoranthene		4.6E-10
Benzo(g,h,i)perylene		
bis(2-Ethylhexyl)phthalate		4.3E-10
Beryllium		1.2E-10
Lead		
Dibenzo(a,h)anthracene		7.8E-09
Indeno(1,2,3-cd)pyrene		9.5E-10
Phenanthrene		
TH-TOTAL		
U-TOTAL		
Total:	8.3E-09	2.6E-08

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TABLE B.3.5-11(c)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	5.9E-01	1.1E+03			TC-99	7.16E-01	5.3E+03				
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254					Aroclor-1254					
Arsenic			3.0E-04		Arsenic			3.0E-04		1.5E-06
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02		1.5E-06
Beryllium			5.0E-03		Beryllium			5.0E-03		5.4E-09
Lead					Lead					
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
Phenanthrene					Phenanthrene					
TH-TOTAL					TH-TOTAL					
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03		2.0E-06
			Total Pathway:					Total Pathway:		
			Total Rad + Chem					Total Rad + Chem		*Total:* 5.0E-06

TABLE B.3.5-11(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.80E-04	1.7E-02	2.8E-11	4.8E-13	CS-137	9.80E-05	1.4E-01	2.8E-11	3.9E-12	4.4E-12
NP-237	3.46E-07	2.1E-05	2.2E-10	4.6E-15	NP-237	3.14E-08	4.5E-05	2.2E-10	9.9E-15	1.5E-14
PU-238	2.59E-09	1.6E-07	2.2E-10	3.5E-17	PU-238	5.18E-10	7.4E-07	2.2E-10	1.6E-16	2.0E-16
PU-239/240	6.50E-10	4.0E-08	2.3E-10	9.1E-18	PU-239/240	1.30E-10	1.9E-07	2.3E-10	4.3E-17	5.2E-17
RA-226	6.07E-06	3.7E-04	7.8E-10	2.9E-13	RA-226	1.09E-05	1.6E-02	7.8E-10	1.2E-11	1.2E-11
RA-228	3.31E-06	2.0E-04	1.0E-10	2.0E-14	RA-228	5.95E-06	8.5E-03	1.0E-10	8.5E-13	8.7E-13
SR-90	4.69E-06	2.9E-04	3.6E-11	1.0E-14	SR-90	2.34E-05	3.3E-02	3.6E-11	1.2E-12	1.2E-12
TH-228	1.28E-07	7.8E-06	5.5E-11	4.3E-16	TH-228	1.07E-07	1.5E-04	5.5E-11	8.4E-15	8.8E-15
TH-230	9.57E-06	5.8E-04	1.3E-11	7.6E-15	TH-230	7.98E-06	1.1E-02	1.3E-11	1.5E-13	1.6E-13
TH-232	2.80E-07	1.7E-05	1.7E-10	2.9E-15	TH-232	2.33E-07	3.3E-04	1.7E-10	5.7E-14	5.9E-14
U-234	3.21E-05	2.0E-03	1.6E-11	3.1E-14	U-234	9.64E-05	1.4E-01	1.6E-11	2.2E-12	2.2E-12
U-235/236	2.67E-06	1.6E-04	1.6E-11	2.6E-15	U-235/236	8.01E-06	1.1E-02	1.6E-11	1.8E-13	1.9E-13
U-238	1.09E-04	6.6E-03	2.8E-11	1.9E-13	U-238	3.27E-04	4.7E-01	2.8E-11	1.3E-11	1.3E-11
			Total Pathway:	1.0E-12				Total Pathway:	3.4E-11	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	9.2E-08	1.5E-11	7.7E+00	1.1E-10	Aroclor-1254	2.9E-08	1.1E-10	7.7E+00	8.3E-10	9.5E-10
Arsenic	3.9E-07	6.2E-11	1.8E+00	1.1E-10	Arsenic	1.2E-08	4.4E-11	1.8E+00	7.6E-11	1.8E-10
Benzo(a)pyrene	2.9E-07	4.6E-11	7.3E+00	3.4E-10	Benzo(a)pyrene	9.2E-08	3.4E-10	7.3E+00	2.5E-09	2.8E-09
Benzo(a)anthracene	9.0E-08	1.4E-11	7.3E-01	1.0E-11	Benzo(a)anthracene	2.9E-08	1.1E-10	7.3E-01	7.8E-11	8.8E-11
Benzo(b)fluoranthene	2.7E-07	4.3E-11	7.3E-01	3.1E-11	Benzo(b)fluoranthene	8.5E-08	3.2E-10	7.3E-01	2.3E-10	2.6E-10
Benzo(g,h,i)perylene	2.1E-06	3.4E-10			Benzo(g,h,i)perylene	6.7E-07	2.5E-09			
bis(2-Ethylhexyl)phthalate	1.3E-05	2.1E-09	1.4E-02	3.0E-11	bis(2-Ethylhexyl)phthalate	4.2E-06	1.6E-08	1.4E-02	2.2E-10	2.5E-10
Beryllium	2.6E-08	4.2E-12	4.3E+00	1.8E-11	Beryllium	2.4E-11	8.8E-14	4.3E+00	3.8E-13	1.8E-11
Lead	9.7E-08	1.5E-11			Lead	8.1E-08	3.0E-10			
Dibenzo(a,h)anthracene	4.6E-07	7.3E-11	7.3E+00	5.3E-10	Dibenzo(a,h)anthracene	1.5E-07	5.4E-10	7.3E+00	3.9E-09	4.5E-09
Indeno(1,2,3-cd)pyrene	5.6E-07	8.9E-11	7.3E-01	6.5E-11	Indeno(1,2,3-cd)pyrene	1.8E-07	6.6E-10	7.3E-01	4.8E-10	5.5E-10
Phenanthrene	1.2E-11	1.9E-15			Phenanthrene	3.8E-12	1.4E-14			
TH-TOTAL	5.4E-09	8.5E-13			TH-TOTAL	4.5E-09	1.7E-11			
U-TOTAL	4.4E-07	7.0E-11			U-TOTAL	1.3E-06	4.9E-09			
			Total Pathway:	1.2E-09				Total Pathway:	8.4E-09	

Total Rad + Chem 1.2E-09 | Total Rad + Chem 8.4E-09 | *Total:* 9.6E-09

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TABLE B.3.5-11(d)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.8E-04	1.7E-02			CS-137	9.80E-05	1.4E-01			
NP-237	3.5E-07	2.1E-05			NP-237	3.14E-08	4.5E-05			
PU-238	2.6E-09	1.6E-07			PU-238	5.18E-10	7.4E-07			
PU-239/240	6.5E-10	4.0E-08			PU-239/240	1.30E-10	1.9E-07			
RA-226	6.1E-06	3.7E-04			RA-226	1.09E-05	1.6E-02			
RA-228	3.3E-06	2.0E-04			RA-228	5.95E-06	8.5E-03			
SR-90	4.7E-06	2.9E-04			SR-90	2.34E-05	3.3E-02			
TH-228	1.3E-07	7.8E-06			TH-228	1.07E-07	1.5E-04			
TH-230	9.6E-06	5.8E-04			TH-230	7.98E-06	1.1E-02			
TH-232	2.8E-07	1.7E-05			TH-232	2.33E-07	3.3E-04			
U-234	3.2E-05	2.0E-03			U-234	9.64E-05	1.4E-01			
U-235/236	2.7E-06	1.6E-04			U-235/236	8.01E-06	1.1E-02			
U-238	1.1E-04	6.6E-03			U-238	3.27E-04	4.7E-01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	9.2E-08	1.7E-10			Aroclor-1254	2.9E-08	1.3E-09			
Arsenic	3.9E-07	7.2E-10	3.0E-04	2.4E-06	Arsenic	1.2E-08	5.1E-10	3.0E-04	1.7E-06	4.1E-06
Benzo(a)pyrene	2.9E-07	5.4E-10			Benzo(a)pyrene	9.2E-08	4.0E-09			
Benzo(a)anthracene	9.0E-08	1.7E-10			Benzo(a)anthracene	2.9E-08	1.2E-09			
Benzo(b)fluoranthene	2.7E-07	5.0E-10			Benzo(b)fluoranthene	8.5E-08	3.7E-09			
Benzo(g,h,i)perylene	2.1E-06	3.9E-09			Benzo(g,h,i)perylene	6.7E-07	2.9E-08			
bis(2-Ethylhexyl)phthalate	1.3E-05	2.5E-08	2.0E-02	1.2E-06	bis(2-Ethylhexyl)phthalate	4.2E-06	1.8E-07	2.0E-02	9.1E-06	1.0E-05
Beryllium	2.6E-08	4.9E-11	5.0E-03	9.8E-09	Beryllium	2.4E-11	1.0E-12	5.0E-03	2.1E-10	1.0E-08
Lead	9.7E-08	1.8E-10			Lead	8.1E-08	3.5E-09			
Dibenzo(a,h)anthracene	4.6E-07	8.5E-10			Dibenzo(a,h)anthracene	1.5E-07	6.3E-09			
Indeno(1,2,3-cd)pyrene	5.6E-07	1.0E-09			Indeno(1,2,3-cd)pyrene	1.8E-07	7.7E-09			
Phenanthrene	1.2E-11	2.2E-14			Phenanthrene	3.8E-12	1.6E-13			
TH-TOTAL	5.4E-09	1.0E-11			TH-TOTAL	4.5E-09	1.9E-10			
U-TOTAL	4.4E-07	8.2E-10	3.0E-03	2.7E-07	U-TOTAL	1.3E-06	5.8E-08	3.0E-03	1.9E-05	2.0E-05
			Total Pathway:	3.9E-06				Total Pathway:	3.0E-05	
			Total Rad + Chem	3.9E-06				Total Rad + Chem	3.0E-05	*Total:* 3.4E-05

TABLE B.3.5-11(d)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	5.94E-01	3.6E+01	1.3E-12	4.7E-11

Total Pathway: 4.7E-11

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	7.16E-01	1.0E+03	1.3E-12	1.3E-09

Total Pathway: 1.3E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 4.7E-11

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.3E-09

	Total	Total Dust & Groundwater Affected
CS-137		4.4E-12
NP-237		1.5E-14
PU-238		2.0E-16
PU-239/240		5.2E-17
RA-226		1.2E-11
RA-228		8.7E-13
SR-90		1.2E-12
TH-228		8.8E-15
TH-230		1.6E-13
TH-232		5.9E-14
U-234		2.2E-12
U-235/236		1.9E-13
U-238		1.3E-11
TC-99	1.4E-09	1.4E-09
Aroclor-1254		9.5E-10
Arsenic		1.8E-10
Benzo(a)pyrene		2.8E-09
Benzo(a)anthracene		8.8E-11
Benzo(b)fluoranthene		2.6E-10
Benzo(g,h,i)perylene		
bis(2-Ethylhexyl)phthalate		2.5E-10
Beryllium		1.8E-11
Lead		
Dibenzo(a,h)anthracene		4.5E-09
Indeno(1,2,3-cd)pyrene		5.5E-10
Phenanthrene		
TH-TOTAL		
U-TOTAL		
Total:	1.4E-09	1.1E-08

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TABLE B.3.5-11(d)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	5.9E-01	3.6E+01			TC-99	7.16E-01	1.0E+03				
Total Pathway:					Total Pathway:						

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			4.1E-06
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02			1.0E-05
Beryllium			5.0E-03		Beryllium			5.0E-03			1.0E-08
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			2.0E-05
Total Pathway:					Total Pathway:						
Total Rad + Chem					Total Rad + Chem					*Total:*	3.4E-05

TABLE B.3.5-12 (a)

FUTURE OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.55E-08	1.7E-01	2.8E-11	4.7E-12	CS-137	8.54E-08	8.9E-02	2.8E-11	2.5E-12	7.2E-12
NP-237	6.32E-08	1.2E-01	2.2E-10	2.7E-11	NP-237	6.32E-08	6.6E-02	2.2E-10	1.5E-11	4.2E-11
PU-238	4.99E-08	9.8E-02	2.2E-10	2.2E-11	PU-238	4.99E-08	5.2E-02	2.2E-10	1.1E-11	3.3E-11
PU-239/240	1.17E-08	2.3E-02	2.3E-10	5.3E-12	PU-239/240	1.17E-08	1.2E-02	2.3E-10	2.8E-12	8.1E-12
RA-226	1.71E-07	3.4E-01	7.8E-10	2.6E-10	RA-226	1.71E-07	1.8E-01	7.8E-10	1.4E-10	4.0E-10
RA-228	1.42E-07	2.8E-01	1.0E-10	2.8E-11	RA-228	1.41E-07	1.5E-01	1.0E-10	1.5E-11	4.3E-11
SR-90	7.63E-08	1.5E-01	3.6E-11	5.4E-12	SR-90	7.61E-08	7.9E-02	3.6E-11	2.9E-12	8.3E-12
TH-228	2.52E-07	5.0E-01	5.5E-11	2.7E-11	TH-228	2.45E-07	2.6E-01	5.5E-11	1.4E-11	4.1E-11
TH-230	3.96E-06	7.8E+00	1.3E-11	1.0E-10	TH-230	3.96E-06	4.1E+00	1.3E-11	5.4E-11	1.6E-10
TH-232	1.15E-07	2.3E-01	1.7E-10	3.9E-11	TH-232	1.15E-07	1.2E-01	1.7E-10	2.0E-11	5.9E-11
U-234	1.82E-06	3.6E+00	1.6E-11	5.7E-11	U-234	1.82E-06	1.9E+00	1.6E-11	3.0E-11	8.8E-11
U-235/236	1.51E-07	3.0E-01	1.6E-11	4.8E-12	U-235/236	1.51E-07	1.6E-01	1.6E-11	2.5E-12	7.3E-12
U-238	6.17E-06	1.2E+01	2.8E-11	3.4E-10	U-238	6.17E-06	6.4E+00	2.8E-11	1.8E-10	5.2E-10
			Total Pathway:	9.3E-10				Total Pathway:	4.9E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.93E-08	2.1E-11	7.7E+00	1.6E-10	Aroclor-1254	1.93E-08	1.1E-11	7.7E+00	8.7E-11	2.5E-10
Arsenic	7.66E-07	8.4E-10	1.8E+00	1.5E-09	Arsenic	7.66E-07	4.5E-10	1.8E+00	7.8E-10	2.3E-09
Benzo(a)pyrene	9.95E-08	1.1E-10	7.3E+00	8.0E-10	Benzo(a)pyrene	9.88E-08	5.8E-11	7.3E+00	4.2E-10	1.2E-09
Benzo(a)anthracene	8.48E-08	9.3E-11	7.3E-01	6.8E-11	Benzo(a)anthracene	8.42E-08	4.9E-11	7.3E-01	3.6E-11	1.0E-10
Benzo(b)fluoranthene	8.96E-08	9.9E-11	7.3E-01	7.2E-11	Benzo(b)fluoranthene	8.89E-08	5.2E-11	7.3E-01	3.8E-11	1.1E-10
Benzo(g,h,i)perylene	5.48E-08	6.0E-11			Benzo(g,h,i)perylene	5.44E-08	3.2E-11			
bis(2-Ethylhexyl)phthalate	8.67E-07	9.6E-10	1.4E-02	1.3E-11	bis(2-Ethylhexyl)phthalate	8.67E-07	5.1E-10	1.4E-02	7.1E-12	2.0E-11
Beryllium	1.41E-07	1.6E-10	4.3E+00	6.7E-10	Beryllium	1.41E-07	8.2E-11	4.3E+00	3.5E-10	1.0E-09
Lead	2.55E-06	2.8E-09			Lead	2.55E-06	1.5E-09			
Dibenzo(a,h)anthracene	2.83E-08	3.1E-11	7.3E+00	2.3E-10	Dibenzo(a,h)anthracene	2.82E-08	1.6E-11	7.3E+00	1.2E-10	3.5E-10
Indeno(1,2,3-cd)pyrene	6.41E-08	7.1E-11	7.3E-01	5.2E-11	Indeno(1,2,3-cd)pyrene	6.36E-08	3.7E-11	7.3E-01	2.7E-11	7.9E-11
Phenanthrene	1.47E-10	1.6E-13			Phenanthrene	1.43E-10	8.4E-14			
TH-TOTAL	2.22E-06	2.4E-09			TH-TOTAL	2.22E-06	1.3E-09			
U-TOTAL	1.97E-05	2.2E-08			U-TOTAL	1.97E-05	1.1E-08			
			Total Pathway:	3.5E-09				Total Pathway:	1.9E-09	
			Total Rad + Chem	4.5E-09				Total Rad + Chem	2.4E-09	*Total:* 6.8E-09

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TABLE B.3.5-12 (a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	8.6E-08	1.7E-01		
NP-237	6.3E-08	1.2E-01		
PU-238	5.0E-08	9.8E-02		
PU-239/240	1.2E-08	2.3E-02		
RA-226	1.7E-07	3.4E-01		
RA-228	1.4E-07	2.8E-01		
SR-90	7.6E-08	1.5E-01		
TH-228	2.5E-07	5.0E-01		
TH-230	4.0E-06	7.8E+00		
TH-232	1.2E-07	2.3E-01		
U-234	1.8E-06	3.6E+00		
U-235/236	1.5E-07	3.0E-01		
U-238	6.2E-06	1.2E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	8.54E-08	8.9E-02		
NP-237	6.32E-08	6.6E-02		
PU-238	4.99E-08	5.2E-02		
PU-239/240	1.17E-08	1.2E-02		
RA-226	1.71E-07	1.8E-01		
RA-228	1.41E-07	1.5E-01		
SR-90	7.61E-08	7.9E-02		
TH-228	2.45E-07	2.6E-01		
TH-230	3.96E-06	4.1E+00		
TH-232	1.15E-07	1.2E-01		
U-234	1.82E-06	1.9E+00		
U-235/236	1.51E-07	1.6E-01		
U-238	6.17E-06	6.4E+00		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	1.9E-08	2.1E-11		
Arsenic	7.7E-07	8.4E-10	3.0E-04	2.8E-06
Benzo(a)pyrene	1.0E-07	1.1E-10		
Benzo(a)anthracene	8.5E-08	9.3E-11		
Benzo(b)fluoranthene	9.0E-08	9.9E-11		
Benzo(g,h,i)perylene	5.5E-08	6.0E-11		
bis(2-Ethylhexyl)phthalat	8.7E-07	9.6E-10	2.0E-02	4.8E-08
Beryllium	1.4E-07	1.6E-10	5.0E-03	3.1E-08
Lead	2.5E-06	2.8E-09		
Dibenzo(a,h)anthracene	2.8E-08	3.1E-11		
Indeno(1,2,3-cd)pyrene	6.4E-08	7.1E-11		
Phenanthrene	1.5E-10	1.6E-13		
TH-TOTAL	2.2E-06	2.4E-09		
U-TOTAL	2.0E-05	2.2E-08	3.0E-03	7.2E-06

Total Pathway: 1.0E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	1.93E-08	1.1E-11		
Arsenic	7.66E-07	4.5E-10	3.0E-04	1.5E-06
Benzo(a)pyrene	9.88E-08	5.8E-11		
Benzo(a)anthracene	8.42E-08	4.9E-11		
Benzo(b)fluoranthene	8.89E-08	5.2E-11		
Benzo(g,h,i)perylene	5.44E-08	3.2E-11		
bis(2-Ethylhexyl)phthalat	8.67E-07	5.1E-10	2.0E-02	2.5E-08
Beryllium	1.41E-07	8.2E-11	5.0E-03	1.6E-08
Lead	2.55E-06	1.5E-09		
Dibenzo(a,h)anthracene	2.82E-08	1.6E-11		
Indeno(1,2,3-cd)pyrene	6.36E-08	3.7E-11		
Phenanthrene	1.43E-10	8.4E-14		
TH-TOTAL	2.22E-06	1.3E-09		
U-TOTAL	1.97E-05	1.1E-08	3.0E-03	3.8E-06

Total Pathway: 5.4E-06

	Total
	4.3E-06
	7.3E-08
	4.8E-08
	1.1E-05

Total Rad + Chem 1.0E-05

Total Rad + Chem 5.4E-06 | *Total:* 1.5E-05

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TABLE B.3.5-12 (a)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			7.2E-12
NP-237			2.2E-10		NP-237			2.2E-10			4.2E-11
PU-238			2.2E-10		PU-238			2.2E-10			3.3E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			8.1E-12
RA-226			7.8E-10		RA-226			7.8E-10			4.0E-10
RA-228			1.0E-10		RA-228			1.0E-10			4.3E-11
SR-90			3.6E-11		SR-90			3.6E-11			8.3E-12
TH-228			5.5E-11		TH-228			5.5E-11			4.1E-11
TH-230			1.3E-11		TH-230			1.3E-11			1.6E-10
TH-232			1.7E-10		TH-232			1.7E-10			5.9E-11
U-234			1.6E-11		U-234			1.6E-11			8.8E-11
U-235/236			1.6E-11		U-235/236			1.6E-11			7.3E-12
U-238			2.8E-11		U-238			2.8E-11			5.2E-10
TC-99	8.87E-04	1.7E+03	1.3E-12	2.3E-09	TC-99	8.87E-04	9.3E+02	1.3E-12	1.2E-09	3.5E-09	3.5E-09
			Total Pathway:	2.3E-09				Total Pathway:	1.2E-09		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		2.5E-10
Arsenic			1.8E+00		Arsenic			1.8E+00		2.3E-09
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		1.2E-09
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		1.0E-10
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		1.1E-10
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalate			1.4E-02		bis(2-Ethylhexyl)phthalate			1.4E-02		2.0E-11
Beryllium			4.3E+00		Beryllium			4.3E+00		1.0E-09
Lead					Lead					
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		3.5E-10
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		7.9E-11
Phenanthrene					Phenanthrene					
TH-TOTAL					TH-TOTAL					
U-TOTAL					U-TOTAL					
			Total Pathway:					Total Pathway:		

Total Rad + Chem	2.3E-09	Total Rad + Chem	1.2E-09	*Total:*	3.5E-09	1.0E-08

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TABLE B.3.5-12 (a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	8.9E-04	1.7E+03		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	8.87E-04	9.3E+02		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		4.3E-06
		7.3E-08
		4.8E-08
		1.1E-05
Total:		1.5E-05

TABLE B.3.5-12 (b)

FUTURE OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.55E-08	7.2E-03	2.8E-11	2.0E-13	CS-137	8.54E-08	1.1E-02	2.8E-11	3.1E-13	5.1E-13
NP-237	6.32E-08	5.3E-03	2.2E-10	1.2E-12	NP-237	6.32E-08	8.1E-03	2.2E-10	1.8E-12	3.0E-12
PU-238	4.99E-08	4.2E-03	2.2E-10	9.2E-13	PU-238	4.99E-08	6.4E-03	2.2E-10	1.4E-12	2.3E-12
PU-239/240	1.17E-08	9.8E-04	2.3E-10	2.3E-13	PU-239/240	1.17E-08	1.5E-03	2.3E-10	3.5E-13	5.7E-13
RA-226	1.71E-07	1.4E-02	7.8E-10	1.1E-11	RA-226	1.71E-07	2.2E-02	7.8E-10	1.7E-11	2.8E-11
RA-228	1.42E-07	1.2E-02	1.0E-10	1.2E-12	RA-228	1.41E-07	1.8E-02	1.0E-10	1.8E-12	3.0E-12
SR-90	7.63E-08	6.4E-03	3.6E-11	2.3E-13	SR-90	7.61E-08	9.8E-03	3.6E-11	3.5E-13	5.8E-13
TH-228	2.52E-07	2.1E-02	5.5E-11	1.2E-12	TH-228	2.45E-07	3.1E-02	5.5E-11	1.7E-12	2.9E-12
TH-230	3.96E-06	3.3E-01	1.3E-11	4.3E-12	TH-230	3.96E-06	5.1E-01	1.3E-11	6.6E-12	1.1E-11
TH-232	1.15E-07	9.7E-03	1.7E-10	1.6E-12	TH-232	1.15E-07	1.5E-02	1.7E-10	2.5E-12	4.2E-12
U-234	1.82E-06	1.5E-01	1.6E-11	2.4E-12	U-234	1.82E-06	2.3E-01	1.6E-11	3.7E-12	6.2E-12
U-235/236	1.51E-07	1.3E-02	1.6E-11	2.0E-13	U-235/236	1.51E-07	1.9E-02	1.6E-11	3.1E-13	5.1E-13
U-238	6.17E-06	5.2E-01	2.8E-11	1.5E-11	U-238	6.17E-06	7.9E-01	2.8E-11	2.2E-11	3.7E-11
			Total Pathway:	3.9E-11				Total Pathway:	6.0E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.93E-08	4.2E-12	7.7E+00	3.3E-11	Aroclor-1254	1.93E-08	6.5E-12	7.7E+00	5.0E-11	8.2E-11
Arsenic	7.66E-07	1.7E-10	1.8E+00	2.9E-10	Arsenic	7.66E-07	2.6E-10	1.8E+00	4.5E-10	7.4E-10
Benzo(a)pyrene	9.95E-08	2.2E-11	7.3E+00	1.6E-10	Benzo(a)pyrene	9.88E-08	3.3E-11	7.3E+00	2.4E-10	4.0E-10
Benzo(a)anthracene	8.48E-08	1.9E-11	7.3E-01	1.4E-11	Benzo(a)anthracene	8.42E-08	2.8E-11	7.3E-01	2.1E-11	3.4E-11
Benzo(b)fluoranthene	8.96E-08	2.0E-11	7.3E-01	1.4E-11	Benzo(b)fluoranthene	8.89E-08	3.0E-11	7.3E-01	2.2E-11	3.6E-11
Benzo(g,h,i)perylene	5.48E-08	1.2E-11			Benzo(g,h,i)perylene	5.44E-08	1.8E-11			
bis(2-Ethylhexyl)phthalate	8.67E-07	1.9E-10	1.4E-02	2.7E-12	bis(2-Ethylhexyl)phthalate	8.67E-07	2.9E-10	1.4E-02	4.1E-12	6.7E-12
Beryllium	1.41E-07	3.1E-11	4.3E+00	1.3E-10	Beryllium	1.41E-07	4.7E-11	4.3E+00	2.0E-10	3.4E-10
Lead	2.55E-06	5.6E-10			Lead	2.55E-06	8.5E-10			
Dibenzo(a,h)anthracene	2.83E-08	6.2E-12	7.3E+00	4.5E-11	Dibenzo(a,h)anthracene	2.82E-08	9.5E-12	7.3E+00	6.9E-11	1.1E-10
Indeno(1,2,3-cd)pyrene	6.41E-08	1.4E-11	7.3E-01	1.0E-11	Indeno(1,2,3-cd)pyrene	6.36E-08	2.1E-11	7.3E-01	1.6E-11	2.6E-11
Phenanthrene	1.47E-10	3.2E-14			Phenanthrene	1.43E-10	4.8E-14			
TH-TOTAL	2.22E-06	4.9E-10			TH-TOTAL	2.22E-06	7.4E-10			
U-TOTAL	1.97E-05	4.3E-09			U-TOTAL	1.97E-05	6.6E-09			
			Total Pathway:	7.0E-10				Total Pathway:	1.1E-09	

Total Rad + Chem	7.4E-10	Total Rad + Chem	1.1E-09	*Total:* 1.9E-09

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TABLE B.3.5-12 (b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	8.6E-08				CS-137	8.54E-08				
NP-237	6.3E-08				NP-237	6.32E-08				
PU-238	5.0E-08				PU-238	4.99E-08				
PU-239/240	1.2E-08				PU-239/240	1.17E-08				
RA-226	1.7E-07				RA-226	1.71E-07				
RA-228	1.4E-07				RA-228	1.41E-07				
SR-90	7.6E-08				SR-90	7.61E-08				
TH-228	2.5E-07				TH-228	2.45E-07				
TH-230	4.0E-06				TH-230	3.96E-06				
TH-232	1.2E-07				TH-232	1.15E-07				
U-234	1.8E-06				U-234	1.82E-06				
U-235/236	1.5E-07				U-235/236	1.51E-07				
U-238	6.2E-06				U-238	6.17E-06				
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.9E-08	4.9E-11			Aroclor-1254	1.93E-08	7.6E-11			
Arsenic	7.7E-07	2.0E-09	3.0E-04	6.5E-06	Arsenic	7.66E-07	3.0E-09	3.0E-04	1.0E-05	1.7E-05
Benzo(a)pyrene	1.0E-07	2.5E-10			Benzo(a)pyrene	9.88E-08	3.9E-10			
Benzo(a)anthracene	8.5E-08	2.2E-10			Benzo(a)anthracene	8.42E-08	3.3E-10			
Benzo(b)fluoranthene	9.0E-08	2.3E-10			Benzo(b)fluoranthene	8.89E-08	3.5E-10			
Benzo(g,h,i)perylene	5.5E-08	1.4E-10			Benzo(g,h,i)perylene	5.44E-08	2.1E-10			
bis(2-Ethylhexyl)phthalat	8.7E-07	2.2E-09	2.0E-02	1.1E-07	bis(2-Ethylhexyl)phthalat	8.67E-07	3.4E-09	2.0E-02	1.7E-07	2.8E-07
Beryllium	1.4E-07	3.6E-10	5.0E-03	7.2E-08	Beryllium	1.41E-07	5.5E-10	5.0E-03	1.1E-07	1.8E-07
Lead	2.5E-06	6.5E-09			Lead	2.55E-06	1.0E-08			
Dibenzo(a,h)anthracene	2.8E-08	7.2E-11			Dibenzo(a,h)anthracene	2.82E-08	1.1E-10			
Indeno(1,2,3-cd)pyrene	6.4E-08	1.6E-10			Indeno(1,2,3-cd)pyrene	6.36E-08	2.5E-10			
Phenanthrene	1.5E-10	3.8E-13			Phenanthrene	1.43E-10	5.6E-13			
TH-TOTAL	2.2E-06	5.7E-09			TH-TOTAL	2.22E-06	8.7E-09			
U-TOTAL	2.0E-05	5.0E-08	3.0E-03	1.7E-05	U-TOTAL	1.97E-05	7.7E-08	3.0E-03	2.6E-05	4.2E-05
			Total Pathway:	2.3E-05				Total Pathway:	3.6E-05	

Total Rad + Chem 2.3E-05

Total Rad + Chem 3.6E-05 *Total:* 5.9E-05

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TABLE B.3.5-12 (b)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	8.87E-04	7.5E+01	1.3E-12	9.7E-11
			Total Pathway:	9.7E-11

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	8.87E-04	1.1E+02	1.3E-12	1.5E-10
			Total Pathway:	1.5E-10

Total	Total Dust & Groundwater Affected
	5.1E-13
	3.0E-12
	2.3E-12
	5.7E-13
	2.8E-11
	3.0E-12
	5.8E-13
	2.9E-12
	1.1E-11
	4.2E-12
	6.2E-12
	5.1E-13
	3.7E-11
2.5E-10	2.5E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

			8.2E-11
			7.4E-10
			4.0E-10
			3.4E-11
			3.6E-11
			6.7E-12
			3.4E-10
			1.1E-10
			2.6E-11

Total Rad + Chem 9.7E-11

Total Rad + Chem 1.5E-10

Total:	2.5E-10	2.1E-09

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FEMP-OU02-6 FINAL
January 21, 1995

TABLE B.3.5-12 (b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	8.9E-04	7.5E+01			TC-99	8.87E-04	1.1E+02				
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			1.7E-05
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalat			2.0E-02		bis(2-Ethylhexyl)phthalat			2.0E-02			2.8E-07
Beryllium			5.0E-03		Beryllium			5.0E-03			1.8E-07
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			4.2E-05
		Total Pathway:					Total Pathway:				

Total Rad + Chem

Total Rad + Chem

Total: 5.9E-05

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TABLE B.3.5-12 (c)

FUTURE OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.55E-08	1.7E-01	2.8E-11	4.7E-12	CS-137	8.54E-08	8.9E-02	2.8E-11	2.5E-12	7.2E-12
NP-237	6.32E-08	1.2E-01	2.2E-10	2.7E-11	NP-237	6.32E-08	6.6E-02	2.2E-10	1.5E-11	4.2E-11
PU-238	4.99E-08	9.8E-02	2.2E-10	2.2E-11	PU-238	4.99E-08	5.2E-02	2.2E-10	1.1E-11	3.3E-11
PU-239/240	1.17E-08	2.3E-02	2.3E-10	5.3E-12	PU-239/240	1.17E-08	1.2E-02	2.3E-10	2.8E-12	8.1E-12
RA-226	1.71E-07	3.4E-01	7.8E-10	2.6E-10	RA-226	1.71E-07	1.8E-01	7.8E-10	1.4E-10	4.0E-10
RA-228	1.42E-07	2.8E-01	1.0E-10	2.8E-11	RA-228	1.41E-07	1.5E-01	1.0E-10	1.5E-11	4.3E-11
SR-90	7.63E-08	1.5E-01	3.6E-11	5.4E-12	SR-90	7.61E-08	7.9E-02	3.6E-11	2.9E-12	8.3E-12
TH-228	2.52E-07	5.0E-01	5.5E-11	2.7E-11	TH-228	2.45E-07	2.6E-01	5.5E-11	1.4E-11	4.1E-11
TH-230	3.96E-06	7.8E+00	1.3E-11	1.0E-10	TH-230	3.96E-06	4.1E+00	1.3E-11	5.4E-11	1.6E-10
TH-232	1.15E-07	2.3E-01	1.7E-10	3.9E-11	TH-232	1.15E-07	1.2E-01	1.7E-10	2.0E-11	5.9E-11
U-234	1.82E-06	3.6E+00	1.6E-11	5.7E-11	U-234	1.82E-06	1.9E+00	1.6E-11	3.0E-11	8.8E-11
U-235/236	1.51E-07	3.0E-01	1.6E-11	4.8E-12	U-235/236	1.51E-07	1.6E-01	1.6E-11	2.5E-12	7.3E-12
U-238	6.17E-06	1.2E+01	2.8E-11	3.4E-10	U-238	6.17E-06	6.4E+00	2.8E-11	1.8E-10	5.2E-10
			Total Pathway:	9.3E-10				Total Pathway:	4.9E-10	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.93E-08	2.1E-11	7.7E+00	1.6E-10	Aroclor-1254	1.93E-08	1.1E-11	7.7E+00	8.7E-11	2.5E-10
Arsenic	7.66E-07	8.4E-10	1.8E+00	1.5E-09	Arsenic	7.66E-07	4.5E-10	1.8E+00	7.8E-10	2.3E-09
Benzo(a)pyrene	9.95E-08	1.1E-10	7.3E+00	8.0E-10	Benzo(a)pyrene	9.88E-08	5.8E-11	7.3E+00	4.2E-10	1.2E-09
Benzo(a)anthracene	8.48E-08	9.3E-11	7.3E-01	6.8E-11	Benzo(a)anthracene	8.42E-08	4.9E-11	7.3E-01	3.6E-11	1.0E-10
Benzo(b)fluoranthene	8.96E-08	9.9E-11	7.3E-01	7.2E-11	Benzo(b)fluoranthene	8.89E-08	5.2E-11	7.3E-01	3.8E-11	1.1E-10
Benzo(g,h,i)perylene	5.48E-08	6.0E-11			Benzo(g,h,i)perylene	5.44E-08	3.2E-11			
bis(2-Ethylhexyl)phthalate	8.67E-07	9.6E-10	1.4E-02	1.3E-11	bis(2-Ethylhexyl)phthalate	8.67E-07	5.1E-10	1.4E-02	7.1E-12	2.0E-11
Beryllium	1.41E-07	1.6E-10	4.3E+00	6.7E-10	Beryllium	1.41E-07	8.2E-11	4.3E+00	3.5E-10	1.0E-09
Lead	2.55E-06	2.8E-09			Lead	2.55E-06	1.5E-09			
Dibenzo(a,h)anthracene	2.83E-08	3.1E-11	7.3E+00	2.3E-10	Dibenzo(a,h)anthracene	2.82E-08	1.6E-11	7.3E+00	1.2E-10	3.5E-10
Indeno(1,2,3-cd)pyrene	6.41E-08	7.1E-11	7.3E-01	5.2E-11	Indeno(1,2,3-cd)pyrene	6.36E-08	3.7E-11	7.3E-01	2.7E-11	7.9E-11
Phenanthrene	1.47E-10	1.6E-13			Phenanthrene	1.43E-10	8.4E-14			
TH-TOTAL	2.22E-06	2.4E-09			TH-TOTAL	2.22E-06	1.3E-09			
U-TOTAL	1.97E-05	2.2E-08			U-TOTAL	1.97E-05	1.1E-08			
			Total Pathway:	3.5E-09				Total Pathway:	1.9E-09	

Total Rad + Chem 4.5E-09 | Total Rad + Chem 2.4E-09 | *Total:* 6.8E-09

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TABLE B.3.5-12 (c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	8.6E-08	1.7E-01		
NP-237	6.3E-08	1.2E-01		
PU-238	5.0E-08	9.8E-02		
PU-239/240	1.2E-08	2.3E-02		
RA-226	1.7E-07	3.4E-01		
RA-228	1.4E-07	2.8E-01		
SR-90	7.6E-08	1.5E-01		
TH-228	2.5E-07	5.0E-01		
TH-230	4.0E-06	7.8E+00		
TH-232	1.2E-07	2.3E-01		
U-234	1.8E-06	3.6E+00		
U-235/236	1.5E-07	3.0E-01		
U-238	6.2E-06	1.2E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	8.54E-08	8.9E-02		
NP-237	6.32E-08	6.6E-02		
PU-238	4.99E-08	5.2E-02		
PU-239/240	1.17E-08	1.2E-02		
RA-226	1.71E-07	1.8E-01		
RA-228	1.41E-07	1.5E-01		
SR-90	7.61E-08	7.9E-02		
TH-228	2.45E-07	2.6E-01		
TH-230	3.96E-06	4.1E+00		
TH-232	1.15E-07	1.2E-01		
U-234	1.82E-06	1.9E+00		
U-235/236	1.51E-07	1.6E-01		
U-238	6.17E-06	6.4E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	1.9E-08	2.1E-11		
Arsenic	7.7E-07	8.4E-10	3.0E-04	2.8E-06
Benzo(a)pyrene	1.0E-07	1.1E-10		
Benzo(a)anthracene	8.5E-08	9.3E-11		
Benzo(b)fluoranthene	9.0E-08	9.9E-11		
Benzo(g,h,i)perylene	5.5E-08	6.0E-11		
bis(2-Ethylhexyl)phthalat	8.7E-07	9.6E-10	2.0E-02	4.8E-08
Beryllium	1.4E-07	1.6E-10	5.0E-03	3.1E-08
Lead	2.5E-06	2.8E-09		
Dibenzo(a,h)anthracene	2.8E-08	3.1E-11		
Indeno(1,2,3-cd)pyrene	6.4E-08	7.1E-11		
Phenanthrene	1.5E-10	1.6E-13		
TH-TOTAL	2.2E-06	2.4E-09		
U-TOTAL	2.0E-05	2.2E-08	3.0E-03	7.2E-06

Total Pathway: 1.0E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	1.93E-08	1.1E-11		
Arsenic	7.66E-07	4.5E-10	3.0E-04	1.5E-06
Benzo(a)pyrene	9.88E-08	5.8E-11		
Benzo(a)anthracene	8.42E-08	4.9E-11		
Benzo(b)fluoranthene	8.89E-08	5.2E-11		
Benzo(g,h,i)perylene	5.44E-08	3.2E-11		
bis(2-Ethylhexyl)phthalat	8.67E-07	5.1E-10	2.0E-02	2.5E-08
Beryllium	1.41E-07	8.2E-11	5.0E-03	1.6E-08
Lead	2.55E-06	1.5E-09		
Dibenzo(a,h)anthracene	2.82E-08	1.6E-11		
Indeno(1,2,3-cd)pyrene	6.36E-08	3.7E-11		
Phenanthrene	1.43E-10	8.4E-14		
TH-TOTAL	2.22E-06	1.3E-09		
U-TOTAL	1.97E-05	1.1E-08	3.0E-03	3.8E-06

Total Pathway: 5.4E-06

Total

4.3E-06

7.3E-08

4.8E-08

1.1E-05

Total Rad + Chem 1.0E-05

Total Rad + Chem 5.4E-06 *Total:* 1.5E-05

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TABLE B.3.5-12 (c)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	8.87E-04	1.7E+03	1.3E-12	2.3E-09
			Total Pathway:	2.3E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	8.87E-04	9.3E+02	1.3E-12	1.2E-09
			Total Pathway:	1.2E-09

Total	Total Dust & Groundwater Affected
	7.2E-12
	4.2E-11
	3.3E-11
	8.1E-12
	4.0E-10
	4.3E-11
	8.3E-12
	4.1E-11
	1.6E-10
	5.9E-11
	8.8E-11
	7.3E-12
	5.2E-10
3.5E-09	3.5E-09

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

2.5E-10			
2.3E-09			
1.2E-09			
1.0E-10			
1.1E-10			
2.0E-11			
1.0E-09			
3.5E-10			
7.9E-11			

Total Rad + Chem 2.3E-09

Total Rad + Chem 1.2E-09

Total:	3.5E-09	1.0E-08

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TABLE B.3.5-12 (c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	8.9E-04	1.7E+03		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	8.87E-04	9.3E+02		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
Arsenic		4.3E-06
bis(2-Ethylhexyl)phthalat		7.3E-08
Beryllium		4.8E-08
U-TOTAL		1.1E-05
Total:		1.5E-05

TABLE B.3.5-12 (d)

FUTURE OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	8.55E-08	7.2E-03	2.8E-11	2.0E-13	CS-137	8.54E-08	1.1E-02	2.8E-11	3.1E-13	5.1E-13
NP-237	6.32E-08	5.3E-03	2.2E-10	1.2E-12	NP-237	6.32E-08	8.1E-03	2.2E-10	1.8E-12	3.0E-12
PU-238	4.99E-08	4.2E-03	2.2E-10	9.2E-13	PU-238	4.99E-08	6.4E-03	2.2E-10	1.4E-12	2.3E-12
PU-239/240	1.17E-08	9.8E-04	2.3E-10	2.3E-13	PU-239/240	1.17E-08	1.5E-03	2.3E-10	3.5E-13	5.7E-13
RA-226	1.71E-07	1.4E-02	7.8E-10	1.1E-11	RA-226	1.71E-07	2.2E-02	7.8E-10	1.7E-11	2.8E-11
RA-228	1.42E-07	1.2E-02	1.0E-10	1.2E-12	RA-228	1.41E-07	1.8E-02	1.0E-10	1.8E-12	3.0E-12
SR-90	7.63E-08	6.4E-03	3.6E-11	2.3E-13	SR-90	7.61E-08	9.8E-03	3.6E-11	3.5E-13	5.8E-13
TH-228	2.52E-07	2.1E-02	5.5E-11	1.2E-12	TH-228	2.45E-07	3.1E-02	5.5E-11	1.7E-12	2.9E-12
TH-230	3.96E-06	3.3E-01	1.3E-11	4.3E-12	TH-230	3.96E-06	5.1E-01	1.3E-11	6.6E-12	1.1E-11
TH-232	1.15E-07	9.7E-03	1.7E-10	1.6E-12	TH-232	1.15E-07	1.5E-02	1.7E-10	2.5E-12	4.2E-12
U-234	1.82E-06	1.5E-01	1.6E-11	2.4E-12	U-234	1.82E-06	2.3E-01	1.6E-11	3.7E-12	6.2E-12
U-235/236	1.51E-07	1.3E-02	1.6E-11	2.0E-13	U-235/236	1.51E-07	1.9E-02	1.6E-11	3.1E-13	5.1E-13
U-238	6.17E-06	5.2E-01	2.8E-11	1.5E-11	U-238	6.17E-06	7.9E-01	2.8E-11	2.2E-11	3.7E-11
			Total Pathway:	3.9E-11				Total Pathway:	6.0E-11	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	1.93E-08	4.2E-12	7.7E+00	3.3E-11	Aroclor-1254	1.93E-08	6.5E-12	7.7E+00	5.0E-11	8.2E-11
Arsenic	7.66E-07	1.7E-10	1.8E+00	2.9E-10	Arsenic	7.66E-07	2.6E-10	1.8E+00	4.5E-10	7.4E-10
Benzo(a)pyrene	9.95E-08	2.2E-11	7.3E+00	1.6E-10	Benzo(a)pyrene	9.88E-08	3.3E-11	7.3E+00	2.4E-10	4.0E-10
Benzo(a)anthracene	8.48E-08	1.9E-11	7.3E-01	1.4E-11	Benzo(a)anthracene	8.42E-08	2.8E-11	7.3E-01	2.1E-11	3.4E-11
Benzo(b)fluoranthene	8.96E-08	2.0E-11	7.3E-01	1.4E-11	Benzo(b)fluoranthene	8.89E-08	3.0E-11	7.3E-01	2.2E-11	3.6E-11
Benzo(g,h,i)perylene	5.48E-08	1.2E-11			Benzo(g,h,i)perylene	5.44E-08	1.8E-11			
bis(2-Ethylhexyl)phthalate	8.67E-07	1.9E-10	1.4E-02	2.7E-12	bis(2-Ethylhexyl)phthalate	8.67E-07	2.9E-10	1.4E-02	4.1E-12	6.7E-12
Beryllium	1.41E-07	3.1E-11	4.3E+00	1.3E-10	Beryllium	1.41E-07	4.7E-11	4.3E+00	2.0E-10	3.4E-10
Lead	2.55E-06	5.6E-10			Lead	2.55E-06	8.5E-10			
Dibenzo(a,h)anthracene	2.83E-08	6.2E-12	7.3E+00	4.5E-11	Dibenzo(a,h)anthracene	2.82E-08	9.5E-12	7.3E+00	6.9E-11	1.1E-10
Indeno(1,2,3-cd)pyrene	6.41E-08	1.4E-11	7.3E-01	1.0E-11	Indeno(1,2,3-cd)pyrene	6.36E-08	2.1E-11	7.3E-01	1.6E-11	2.6E-11
Phenanthrene	1.47E-10	3.2E-14			Phenanthrene	1.43E-10	4.8E-14			
TH-TOTAL	2.22E-06	4.9E-10			TH-TOTAL	2.22E-06	7.4E-10			
U-TOTAL	1.97E-05	4.3E-09			U-TOTAL	1.97E-05	6.6E-09			
			Total Pathway:	7.0E-10				Total Pathway:	1.1E-09	

Total Rad + Chem 7.4E-10 | Total Rad + Chem 1.1E-09 | *Total:* 1.9E-09

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TABLE B.3.5-12 (d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	8.6E-08	7.2E-03			CS-137	8.54E-08	1.1E-02			
NP-237	6.3E-08	5.3E-03			NP-237	6.32E-08	8.1E-03			
PU-238	5.0E-08	4.2E-03			PU-238	4.99E-08	6.4E-03			
PU-239/240	1.2E-08	9.8E-04			PU-239/240	1.17E-08	1.5E-03			
RA-226	1.7E-07	1.4E-02			RA-226	1.71E-07	2.2E-02			
RA-228	1.4E-07	1.2E-02			RA-228	1.41E-07	1.8E-02			
SR-90	7.6E-08	6.4E-03			SR-90	7.61E-08	9.8E-03			
TH-228	2.5E-07	2.1E-02			TH-228	2.45E-07	3.1E-02			
TH-230	4.0E-06	3.3E-01			TH-230	3.96E-06	5.1E-01			
TH-232	1.2E-07	9.7E-03			TH-232	1.15E-07	1.5E-02			
U-234	1.8E-06	1.5E-01			U-234	1.82E-06	2.3E-01			
U-235/236	1.5E-07	1.3E-02			U-235/236	1.51E-07	1.9E-02			
U-238	6.2E-06	5.2E-01			U-238	6.17E-06	7.9E-01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.9E-08	4.9E-11			Aroclor-1254	1.93E-08	7.6E-11			
Arsenic	7.7E-07	2.0E-09	3.0E-04	6.5E-06	Arsenic	7.66E-07	3.0E-09	3.0E-04	1.0E-05	1.7E-05
Benzo(a)pyrene	1.0E-07	2.5E-10			Benzo(a)pyrene	9.88E-08	3.9E-10			
Benzo(a)anthracene	8.5E-08	2.2E-10			Benzo(a)anthracene	8.42E-08	3.3E-10			
Benzo(b)fluoranthene	9.0E-08	2.3E-10			Benzo(b)fluoranthene	8.89E-08	3.5E-10			
Benzo(g,h,i)perylene	5.5E-08	1.4E-10			Benzo(g,h,i)perylene	5.44E-08	2.1E-10			
bis(2-Ethylhexyl)phthalat	8.7E-07	2.2E-09	2.0E-02	1.1E-07	bis(2-Ethylhexyl)phthalat	8.67E-07	3.4E-09	2.0E-02	1.7E-07	2.8E-07
Beryllium	1.4E-07	3.6E-10	5.0E-03	7.2E-08	Beryllium	1.41E-07	5.5E-10	5.0E-03	1.1E-07	1.8E-07
Lead	2.5E-06	6.5E-09			Lead	2.55E-06	1.0E-08			
Dibenzo(a,h)anthracene	2.8E-08	7.2E-11			Dibenzo(a,h)anthracene	2.82E-08	1.1E-10			
Indeno(1,2,3-cd)pyrene	6.4E-08	1.6E-10			Indeno(1,2,3-cd)pyrene	6.36E-08	2.5E-10			
Phenanthrene	1.5E-10	3.8E-13			Phenanthrene	1.43E-10	5.6E-13			
TH-TOTAL	2.2E-06	5.7E-09			TH-TOTAL	2.22E-06	8.7E-09			
U-TOTAL	2.0E-05	5.0E-08	3.0E-03	1.7E-05	U-TOTAL	1.97E-05	7.7E-08	3.0E-03	2.6E-05	4.2E-05
		Total Pathway:		2.3E-05			Total Pathway:		3.6E-05	

Total Rad + Chem 2.3E-05

Total Rad + Chem 3.6E-05 *Total:* 5.9E-05

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TABLE B.3.5-12 (d)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	8.87E-04	7.5E+01	1.3E-12	9.7E-11
			Total Pathway:	9.7E-11

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	8.87E-04	1.1E+02	1.3E-12	1.5E-10
			Total Pathway:	1.5E-10

Total	Total Dust & Groundwater Affected
	5.1E-13
	3.0E-12
	2.3E-12
	5.7E-13
	2.8E-11
	3.0E-12
	5.8E-13
	2.9E-12
	1.1E-11
	4.2E-12
	6.2E-12
	5.1E-13
	3.7E-11
2.5E-10	2.5E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

			8.2E-11
			7.4E-10
			4.0E-10
			3.4E-11
			3.6E-11
			6.7E-12
			3.4E-10
			1.1E-10
			2.6E-11

Total Rad + Chem 9.7E-11

Total Rad + Chem 1.5E-10

Total:	2.5E-10	2.1E-09

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TABLE B.3.5-12 (d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	8.9E-04			

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	8.87E-04			

Total Pathway:

	Total	Total Dust & Groundwater Affected

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

	Arsenic	1.7E-05
	bis(2-Ethylhexyl)phthalat	2.8E-07
	Beryllium	1.8E-07
	U-TOTAL	4.2E-05

Total Rad + Chem

Total Rad + Chem

Total:	5.9E-05

TABLE B.3.5-13(a)
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
LIME SLUDGE PONDS: GROUNDWATER

Carcinogenic Risk

Radiation Risk								
Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	1.70E-01	8.3E+03	1.3E-12	1.1E-08	Not applicable	Not applicable	1.1E-08
			Total Pathway:	1.1E-08	Total Pathway:	Total Pathway:	
			Total Rad + Chem	1.1E-08	Total Rad + Chem	Total Rad + Chem	*Total:* 1.1E-08

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TABLE B.3.5-13(b)
FUTURE, OFF-PROPERTY CHILD (PRIVATE OWNERSHIP)
LIME SLUDGE PONDS: GROUNDWATER
Carcinogenic Risk

Radiation Risk									
Ingestion/Groundwater					Inhalation/Groundwater		Dermal Contact/Groundwater		Total
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk					
TC-99	1.70E-01	3.6E+02	1.3E-12	4.6E-10	Not applicable		Not applicable		4.6E-10
			Total Pathway:	4.6E-10	Total Pathway:	0.0E+00	Total Pathway:	0.0E+00	
			Total Rad + Chem	4.6E-10	Total Rad + Chem	0.0E+00	Total Rad + Chem	0.0E+00	*Total:* 4.6E-10

TABLE B.3.5-13(c)
FUTURE, OFF-PROPERTY FARMER (FEDERAL OWNERSHIP)
LIME SLUDGE PONDS: GROUNDWATER

Carcinogenic Risk

Radiation Risk								
Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk			
TC-99	1.70E-01	8.3E+03	1.3E-12	1.1E-08	Not applicable	Not applicable	1.1E-08
			Total Pathway:	1.1E-08	Total Pathway:	Total Pathway:	
			Total Rad + Chem	1.1E-08	Total Rad + Chem	Total Rad + Chem	*Total:* 1.1E-08

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TABLE B.3.5-13(d)
FUTURE, OFF-PROPERTY CHILD (FEDERAL OWNERSHIP)
LIME SLUDGE PONDS: GROUNDWATER

Carcinogenic Risk

Radiation Risk									
Ingestion/Groundwater					Inhalation/Groundwater		Dermal Contact/Groundwater		Total
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk					
TC-99	1.70E-01	3.6E+02	1.3E-12	4.6E-10	Not applicable		Not applicable		4.6E-10
			Total Pathway:	4.6E-10	Total Pathway:	0.0E+00	Total Pathway:	0.0E+00	
			Total Rad + Chem	4.6E-10	Total Rad + Chem	0.0E+00	Total Rad + Chem	0.0E+00	*Total:* 4.6E-10

TABLE B.3.5-14
FUTURE, EXPANDED TRESPASSER
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.83E-05	6.0E-02	1.9E-11	1.1E-12
NP-237	1.87E-05	6.1E-02	2.9E-08	1.8E-09
PU-238	1.50E-05	4.9E-02	3.9E-08	1.9E-09
PU-239/240	3.51E-06	1.1E-02	3.8E-08	4.3E-10
RA-226	4.99E-05	1.6E-01	7.0E-09	1.1E-09
RA-228	4.26E-05	1.4E-01	6.9E-10	9.6E-11
SR-90	2.04E-05	6.6E-02	6.2E-11	4.1E-12
TH-228	7.57E-05	2.5E-01	7.8E-08	1.9E-08
TH-230	1.16E-03	3.8E+00	2.9E-08	1.1E-07
TH-232	3.40E-05	1.1E-01	1.1E-07	1.2E-08
U-234	5.46E-04	1.8E+00	2.6E-08	4.6E-08
U-235/236	4.53E-05	1.5E-01	2.5E-08	3.7E-09
U-238	1.86E-03	6.1E+00	5.2E-08	3.1E-07
			Total Pathway:	5.1E-07

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	7.02E-01	2.3E+01	2.8E-11	6.4E-10
NP-237	7.20E-01	2.3E+01	2.2E-10	5.1E-09
PU-238	5.76E-01	1.9E+01	2.2E-10	4.1E-09
PU-239/240	1.35E-01	4.4E+00	2.3E-10	1.0E-09
RA-226	1.92E+00	6.2E+01	7.8E-10	4.9E-08
RA-228	1.64E+00	5.3E+01	1.0E-10	5.3E-09
SR-90	7.85E-01	2.6E+01	3.6E-11	9.2E-10
TH-228	2.91E+00	9.5E+01	5.5E-11	5.2E-09
TH-230	4.48E+01	1.5E+03	1.3E-11	1.9E-08
TH-232	1.31E+00	4.3E+01	1.7E-10	7.2E-09
U-234	2.10E+01	6.8E+02	1.6E-11	1.1E-08
U-235/236	1.74E+00	5.7E+01	1.6E-11	9.0E-10
U-238	7.14E+01	2.3E+03	2.8E-11	6.5E-08
			Total Pathway:	1.7E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Consubc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	1.53E-09	4.0E-12		
Arsenic	1.87E-07	4.8E-10	1.5E+01	7.3E-09
Benzo(a)pyrene	2.86E-08	7.4E-11	6.1E+00	4.5E-10
Benzo(a)anthracene	2.37E-08	6.1E-11	6.1E-01	3.7E-11
Benzo(b)fluoranthene	2.60E-08	6.7E-11	6.1E-01	4.1E-11
Benzo(g,h,i)perylene	1.61E-08	4.2E-11		
bis(2-Ethylhexyl)phthalate	2.60E-07	6.7E-10		
Beryllium	3.95E-08	1.0E-10	8.4E+00	8.6E-10
Lead	7.17E-07	1.9E-09		
Dibenzo(a,h)anthracene	8.32E-09	2.2E-11	6.1E+00	1.3E-10
Indeno(1,2,3-cd)pyrene	1.87E-08	4.8E-11	6.1E-01	3.0E-11
Phenanthrene	4.10E-08	1.1E-10		
TH-TOTAL	6.43E-07	1.7E-09		
U-TOTAL	5.57E-06	1.4E-08		
			Total Pathway:	8.8E-09

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	5.90E-02	1.4E-09	7.7E+00	1.1E-08
Arsenic	7.19E+00	1.7E-07	1.8E+00	3.0E-07
Benzo(a)pyrene	1.10E+00	2.6E-08	7.3E+00	1.9E-07
Benzo(a)anthracene	9.10E-01	2.2E-08	7.3E-01	1.6E-08
Benzo(b)fluoranthene	1.00E+00	2.4E-08	7.3E-01	1.7E-08
Benzo(g,h,i)perylene	6.30E-01	1.5E-08		
bis(2-Ethylhexyl)phthalate	1.00E+01	2.4E-07	1.4E-02	3.4E-09
Beryllium	1.52E+00	3.6E-08	4.3E+00	1.6E-07
Lead	2.76E+01	6.6E-07		
Dibenzo(a,h)anthracene	3.20E-01	7.7E-09	7.3E+00	5.6E-08
Indeno(1,2,3-cd)pyrene	7.20E-01	1.7E-08	7.3E-01	1.3E-08
Phenanthrene	1.60E+00	3.8E-08		
TH-TOTAL	2.51E+01	6.0E-07		
U-TOTAL	2.14E+02	5.1E-06		
			Total Pathway:	7.7E-07

Total Rad + Chem 5.2E-07

Total Rad + Chem 9.4E-07

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TABLE B.3.5-14
(continued)

CARCINOGENIC RISK

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	3.1E-01	2.0E-06	6.3E-07	6.3E-07
	NP-237	3.2E-01	4.3E-07	1.4E-07	1.5E-07
	PU-238	2.6E-01	2.8E-11	7.2E-12	6.0E-09
	PU-239/240	6.0E-02	2.7E-11	1.6E-12	1.4E-09
	RA-226	8.6E-01	6.0E-06	5.2E-06	5.2E-06
	RA-228	7.3E-01	2.9E-06	2.1E-06	2.1E-06
	SR-90	3.5E-01			9.2E-10
	TH-228	1.3E+00	5.6E-06	7.3E-06	7.3E-06
	TH-230	2.0E+01	5.4E-11	1.1E-09	1.3E-07
	TH-232	5.9E-01	8.5E-06	5.0E-06	5.0E-06
	U-234	9.4E+00	3.0E-11	2.8E-10	5.7E-08
	U-235/236	7.8E-01	2.4E-07	1.9E-07	1.9E-07
	U-238	3.2E+01	3.6E-08	1.2E-06	1.5E-06
Total Pathway:			Total Pathway:	2.2E-05	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	3.24E-08	1.0E+01	3.3E-07					3.4E-07
Arsenic	6.59E-08	1.8E+00	1.2E-07					4.3E-07
Benzo(a)pyrene			1.9E-07					3.9E-07
Benzo(a)anthracene			1.6E-08					3.2E-08
Benzo(b)fluoranthene			1.7E-08					3.5E-08
Benzo(g,h,i)perylene	1.73E-06							
bis(2-Ethylhexyl)phthalate	3.66E-07	1.4E-02	5.1E-09					8.5E-09
Beryllium			1.6E-07					3.1E-07
Lead	2.53E-06							
Dibenzo(a,h)anthracene			5.6E-08	Not applicable				1.1E-07
Indeno(1,2,3-cd)pyrene			1.3E-08					2.5E-08
Phenanthrene	4.40E-06							
TH-TOTAL	2.30E-06							
U-TOTAL	1.96E-05							
		Total Pathway:	9.1E-07			Total Pathway:		

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 9.1E-07 2.2E-05 *Total:* 2.4E-05

TABLE B.3.5-14
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.83E-05	6.0E-02		
NP-237	1.87E-05	6.1E-02		
PU-238	1.50E-05	4.9E-02		
PU-239/240	3.51E-06	1.1E-02		
RA-226	4.99E-05	1.6E-01		
RA-228	4.26E-05	1.4E-01		
SR-90	2.04E-05	6.6E-02		
TH-228	7.57E-05	2.5E-01		
TH-230	1.16E-03	3.8E+00		
TH-232	3.40E-05	1.1E-01		
U-234	5.46E-04	1.8E+00		
U-235/236	4.53E-05	1.5E-01		
U-238	1.86E-03	6.1E+00		
Total Pathway:				

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	7.02E-01	2.3E+01		
NP-237	7.20E-01	2.3E+01		
PU-238	5.76E-01	1.9E+01		
PU-239/240	1.35E-01	4.4E+00		
RA-226	1.92E+00	6.2E+01		
RA-228	1.64E+00	5.3E+01		
SR-90	7.85E-01	2.6E+01		
TH-228	2.91E+00	9.5E+01		
TH-230	4.48E+01	1.5E+03		
TH-232	1.31E+00	4.3E+01		
U-234	2.10E+01	6.8E+02		
U-235/236	1.74E+00	5.7E+01		
U-238	7.14E+01	2.3E+03		
Total Pathway:				

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Consubc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.53E-09	6.3E-12		
Arsenic	1.87E-07	7.7E-10		
Benzo(a)pyrene	2.86E-08	1.2E-10		
Benzo(a)anthracene	2.37E-08	9.8E-11		
Benzo(b)fluoranthene	2.60E-08	1.1E-10		
Benzo(g,h,i)perylene	1.61E-08	6.6E-11		
bis(2-Ethylhexyl)phthalate	2.60E-07	1.1E-09		
Beryllium	3.95E-08	1.6E-10		
Lead	7.17E-07	3.0E-09		
Dibenzo(a,h)anthracene	8.32E-09	3.4E-11		
Indeno(1,2,3-cd)pyrene	1.87E-08	7.7E-11		
Phenanthrene	4.10E-08	1.7E-10		
TH-TOTAL	6.43E-07	2.6E-09		
U-TOTAL	5.57E-06	2.3E-08		
Total Pathway:				

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	5.90E-02	2.2E-09		
Arsenic	7.19E+00	2.7E-07	3.0E-04	9.1E-04
Benzo(a)pyrene	1.10E+00	4.2E-08		
Benzo(a)anthracene	9.10E-01	3.5E-08		
Benzo(b)fluoranthene	1.00E+00	3.8E-08		
Benzo(g,h,i)perylene	6.30E-01	2.4E-08		
bis(2-Ethylhexyl)phthalate	1.00E+01	3.8E-07	2.0E-02	1.9E-05
Beryllium	1.52E+00	5.8E-08	5.0E-03	1.2E-05
Lead	2.76E+01	1.1E-06		
Dibenzo(a,h)anthracen	3.20E-01	1.2E-08		
Indeno(1,2,3-cd)pyrene	7.20E-01	2.7E-08		
Phenanthrene	1.60E+00	6.1E-08		
TH-TOTAL	2.51E+01	9.6E-07		
U-TOTAL	2.14E+02	8.2E-06	3.0E-03	2.7E-03
Total Pathway:				3.7E-03

Total Rad + Chem

Total Rad + Chem 3.7E-03

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TABLE B.3.5-14
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	3.1E-01		
	NP-237	3.2E-01		
	PU-238	2.6E-01		
	PU-239/240	6.0E-02		
	RA-226	8.6E-01		
	RA-228	7.3E-01		
	SR-90	3.5E-01		
	TH-228	1.3E+00		
	TH-230	2.0E+01		
	TH-232	5.9E-01		
	U-234	9.4E+00		
	U-235/236	7.8E-01		
	U-238	3.2E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				Total
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Aroclor-1254	5.2E-08							
Arsenic	1.0E-07	2.9E-04	3.7E-04					1.3E-03
Benzo(a)pyrene								
Benzo(a)anthracene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	2.8E-06							
bis(2-Ethylhexyl)phthalate	5.8E-07	2.0E-02	2.9E-05					4.8E-05
Beryllium	2.2E-07	5.0E-05	4.4E-03					4.4E-03
Lead	4.0E-06							
Dibenzo(a,h)anthracen				Not applicable				
Indeno(1,2,3-cd)pyren								
Phenanthrene	7.0E-06							
TH-TOTAL	3.7E-06							
U-TOTAL	3.1E-05	1.5E-04	2.1E-01					2.1E-01
		Total Pathway:	2.1E-01			Total Pathway:		

Total Rad + Chem 2.1E-01

Total: 2.2E-01

TABLE B.3.5-15(a)
FUTURE ON-PROPERTY FARMER (RME VALUES)
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.05E-05	1.2E+00	1.9E-11	2.3E-11	2.3E-11
NP-237	1.08E-05	1.3E+00	2.9E-08	3.6E-08	3.6E-08
PU-238	8.64E-06	1.0E+00	3.9E-08	3.9E-08	3.9E-08
PU-239/240	2.03E-06	2.4E-01	3.8E-08	8.9E-09	8.9E-09
RA-226	2.88E-05	3.3E+00	7.0E-09	2.3E-08	2.3E-08
RA-228	2.46E-05	2.9E+00	6.9E-10	2.0E-09	2.0E-09
SR-90	1.18E-05	1.4E+00	6.2E-11	8.5E-11	8.5E-11
TH-228	4.37E-05	5.1E+00	7.8E-08	4.0E-07	4.0E-07
TH-230	6.72E-04	7.8E+01	2.9E-08	2.3E-06	2.3E-06
TH-232	1.96E-05	2.3E+00	1.1E-07	2.5E-07	2.5E-07
U-234	3.15E-04	3.7E+01	2.6E-08	9.5E-07	9.5E-07
U-235/236	2.61E-05	3.0E+00	2.5E-08	7.6E-08	7.6E-08
U-238	1.07E-03	1.2E+02	5.2E-08	6.4E-06	6.4E-06
			Total Pathway:	1.0E-05	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	8.85E-10	5.7E-11			
Arsenic	1.08E-07	7.0E-09	1.5E+01	1.0E-07	1.0E-07
Benzo(a)pyrene	1.65E-08	1.1E-09	6.1E+00	6.5E-09	6.5E-09
Benzo(a)anthracene	1.37E-08	8.9E-10	6.1E-01	5.4E-10	5.4E-10
Benzo(b)fluoranthene	1.50E-08	9.7E-10	6.1E-01	5.9E-10	5.9E-10
Benzo(g,h,i)perylene	9.51E-09	6.2E-10			
bis(2-Ethylhexyl)phthalate	1.50E-07	9.7E-09			
Beryllium	2.28E-08	1.5E-09	8.4E+00	1.2E-08	1.2E-08
Lead	4.13E-07	2.7E-08			
Dibenzo(a,h)anthracene	4.80E-09	3.1E-10	6.1E+00	1.9E-09	1.9E-09
Indeno(1,2,3-cd)pyrene	1.08E-08	7.0E-10	6.1E-01	4.3E-10	4.3E-10
Phenanthrene	2.42E-08	1.6E-09			
TH-TOTAL	3.79E-07	2.5E-08			
U-TOTAL	3.21E-06	2.1E-07			
			Total Pathway:	1.3E-07	

Total Rad + Chem 1.1E-05 *Total:* 1.1E-05

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TABLE B.3.5-15(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.05E-05	1.2E+00		
NP-237	1.08E-05	1.3E+00		
PU-238	8.64E-06	1.0E+00		
PU-239/240	2.03E-06	2.4E-01		
RA-226	2.88E-05	3.3E+00		
RA-228	2.46E-05	2.9E+00		
SR-90	1.18E-05	1.4E+00		
TH-228	4.37E-05	5.1E+00		
TH-230	6.72E-04	7.8E+01		
TH-232	1.96E-05	2.3E+00		
U-234	3.15E-04	3.7E+01		
U-235/236	2.61E-05	3.0E+00		
U-238	1.07E-03	1.2E+02		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.85E-10	5.7E-11		
Arsenic	1.08E-07	7.0E-09		
Benzo(a)pyrene	1.65E-08	1.1E-09		
Benzo(a)anthracene	1.37E-08	8.9E-10		
Benzo(b)fluoranthene	1.50E-08	9.7E-10		
Benzo(g,h,i)perylene	9.51E-09	6.2E-10		
bis(2-Ethylhexyl)phthalate	1.50E-07	9.7E-09		
Beryllium	2.28E-08	1.5E-09		
Lead	4.13E-07	2.7E-08		
Dibenzo(a,h)anthracene	4.80E-09	3.1E-10		
Indeno(1,2,3-cd)pyrene	1.08E-08	7.0E-10		
Phenanthrene	2.42E-08	1.6E-09		
TH-TOTAL	3.79E-07	2.5E-08		
U-TOTAL	3.21E-06	2.1E-07		

Total Pathway:

Total Rad + Chem

Total

Total:

TABLE B.3.5-15(b)
FUTURE ON-PROPERTY CHILD
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.05E-05	2.2E-02	1.9E-11	4.2E-13	4.2E-13
NP-237	1.08E-05	2.3E-02	2.9E-08	6.6E-10	6.6E-10
PU-238	8.64E-06	1.8E-02	3.9E-08	7.1E-10	7.1E-10
PU-239/240	2.03E-06	4.3E-03	3.8E-08	1.6E-10	1.6E-10
RA-226	2.88E-05	6.0E-02	7.0E-09	4.2E-10	4.2E-10
RA-228	2.46E-05	5.2E-02	6.9E-10	3.6E-11	3.6E-11
SR-90	1.18E-05	2.5E-02	6.2E-11	1.5E-12	1.5E-12
TH-228	4.37E-05	9.2E-02	7.8E-08	7.2E-09	7.2E-09
TH-230	6.72E-04	1.4E+00	2.9E-08	4.1E-08	4.1E-08
TH-232	1.96E-05	4.1E-02	1.1E-07	4.5E-09	4.5E-09
U-234	3.15E-04	6.6E-01	2.6E-08	1.7E-08	1.7E-08
U-235/236	2.61E-05	5.5E-02	2.5E-08	1.4E-09	1.4E-09
U-238	1.07E-03	2.2E+00	5.2E-08	1.2E-07	1.2E-07
			Total Pathway:	1.9E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	8.85E-10	4.8E-12			
Arsenic	1.08E-07	5.9E-10	1.5E+01	8.9E-09	8.9E-09
Benzo(a)pyrene	1.65E-08	9.0E-11	6.1E+00	5.5E-10	5.5E-10
Benzo(a)anthracene	1.37E-08	7.5E-11	6.1E-01	4.6E-11	4.6E-11
Benzo(b)fluoranthene	1.50E-08	8.2E-11	6.1E-01	5.0E-11	5.0E-11
Benzo(g,h,i)perylene	9.51E-09	5.2E-11			
bis(2-Ethylhexyl)phthalate	1.50E-07	8.2E-10			
Beryllium	2.28E-08	1.2E-10	8.4E+00	1.0E-09	1.0E-09
Lead	4.13E-07	2.3E-09			
Dibenzo(a,h)anthracene	4.80E-09	2.6E-11	6.1E+00	1.6E-10	1.6E-10
Indeno(1,2,3-cd)pyrene	1.08E-08	5.9E-11	6.1E-01	3.6E-11	3.6E-11
Phenanthrene	2.42E-08	1.3E-10			
TH-TOTAL	3.79E-07	2.1E-09			
U-TOTAL	3.21E-06	1.8E-08			
			Total Pathway:	1.1E-08	

Total Rad + Chem 2.0E-07 *Total:* 2.0E-07

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TABLE B.3.5-15(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.05E-05	2.2E-02		
NP-237	1.08E-05	2.3E-02		
PU-238	8.64E-06	1.8E-02		
PU-239/240	2.03E-06	4.3E-03		
RA-226	2.88E-05	6.0E-02		
RA-228	2.46E-05	5.2E-02		
SR-90	1.18E-05	2.5E-02		
TH-228	4.37E-05	9.2E-02		
TH-230	6.72E-04	1.4E+00		
TH-232	1.96E-05	4.1E-02		
U-234	3.15E-04	6.6E-01		
U-235/236	2.61E-05	5.5E-02		
U-238	1.07E-03	2.2E+00		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.85E-10	5.7E-11		
Arsenic	1.08E-07	6.9E-09		
Benzo(a)pyrene	1.65E-08	1.1E-09		
Benzo(a)anthracene	1.37E-08	8.8E-10		
Benzo(b)fluoranthene	1.50E-08	9.6E-10		
Benzo(g,h,i)perylene	9.51E-09	6.1E-10		
bis(2-Ethylhexyl)phthalate	1.50E-07	9.6E-09		
Beryllium	2.28E-08	1.5E-09		
Lead	4.13E-07	2.6E-08		
Dibenzo(a,h)anthracene	4.80E-09	3.1E-10		
Indeno(1,2,3-cd)pyrene	1.08E-08	6.9E-10		
Phenanthrene	2.42E-08	1.5E-09		
TH-TOTAL	3.79E-07	2.4E-08		
U-TOTAL	3.21E-06	2.1E-07		

Total Pathway:

Total Rad + Chem

Total
Total:

TABLE B.3.5-16(a)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.39E-02	4.4E+01	2.8E-11	1.2E-09	CS-137	8.36E-03	6.1E+01	2.8E-11	1.7E-09	2.9E-09
NP-237	6.52E-05	1.2E-01	2.2E-10	2.6E-11	NP-237	5.93E-06	4.4E-02	2.2E-10	9.6E-12	3.6E-11
PU-238	2.81E-07	5.2E-04	2.2E-10	1.1E-13	PU-238	5.62E-08	4.1E-04	2.2E-10	9.1E-14	2.0E-13
PU-239/240	1.68E-07	3.1E-04	2.3E-10	7.1E-14	PU-239/240	3.37E-08	2.5E-04	2.3E-10	5.7E-14	1.3E-13
RA-226	1.42E-03	2.6E+00	7.8E-10	2.0E-09	RA-226	2.56E-03	1.9E+01	7.8E-10	1.5E-08	1.7E-08
RA-228	2.83E-04	5.2E-01	1.0E-10	5.2E-11	RA-228	5.09E-04	3.7E+00	1.0E-10	3.7E-10	4.3E-10
SR-90	1.02E-03	1.9E+00	3.6E-11	6.7E-11	SR-90	5.09E-03	3.7E+01	3.6E-11	1.3E-09	1.4E-09
TH-228	1.09E-05	2.0E-02	5.5E-11	1.1E-12	TH-228	9.04E-06	6.6E-02	5.5E-11	3.7E-12	4.8E-12
TH-230	8.87E-04	1.6E+00	1.3E-11	2.1E-11	TH-230	7.39E-04	5.4E+00	1.3E-11	7.1E-11	9.2E-11
TH-232	2.37E-05	4.4E-02	1.7E-10	7.4E-12	TH-232	1.98E-05	1.5E-01	1.7E-10	2.5E-11	3.2E-11
U-234	3.67E-03	6.7E+00	1.6E-11	1.1E-10	U-234	1.10E-02	8.1E+01	1.6E-11	1.3E-09	1.4E-09
U-235/236	3.04E-04	5.6E-01	1.6E-11	8.9E-12	U-235/236	9.12E-04	6.7E+00	1.6E-11	1.1E-10	1.2E-10
U-238	1.25E-02	2.3E+01	2.8E-11	6.4E-10	U-238	3.74E-02	2.7E+02	2.8E-11	7.7E-09	8.3E-09
		Total Pathway:		4.2E-09			Total Pathway:		2.7E-08	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	1.0E-06	1.0E-09	7.7E+00	8.1E-09	Aroclor-1254	3.2E-07	1.3E-09	7.7E+00	1.0E-08	1.8E-08
Arsenic	3.3E-05	3.4E-08	1.8E+00	6.0E-08	Arsenic	9.9E-07	4.1E-09	1.8E+00	7.1E-09	6.7E-08
Benzo(a)pyrene	2.5E-05	2.5E-08	7.3E+00	1.8E-07	Benzo(a)pyrene	7.8E-06	3.2E-08	7.3E+00	2.3E-07	4.2E-07
Benzo(a)anthracene	7.7E-06	7.9E-09	7.3E-01	5.8E-09	Benzo(a)anthracene	2.4E-06	1.0E-08	7.3E-01	7.3E-09	1.3E-08
Benzo(b)fluoranthene	2.3E-05	2.4E-08	7.3E-01	1.7E-08	Benzo(b)fluoranthene	7.2E-06	3.0E-08	7.3E-01	2.2E-08	3.9E-08
Benzo(g,h,i)perylene	1.8E-04	1.9E-07			Benzo(g,h,i)perylene	5.7E-05	2.4E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.2E-06	1.4E-02	1.6E-08	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-06	1.4E-02	2.0E-08	3.7E-08
Beryllium	5.8E-06	5.9E-09	4.3E+00	2.6E-08	Beryllium	5.2E-09	2.1E-11	4.3E+00	9.2E-11	2.6E-08
Lead	1.0E-04	1.1E-07			Lead	8.6E-05	3.5E-07			
Dibenzo(a,h)anthracene	3.9E-05	4.0E-08	7.3E+00	2.9E-07	Dibenzo(a,h)anthracene	1.2E-05	5.0E-08	7.3E+00	3.7E-07	6.6E-07
Indeno(1,2,3-cd)pyrene	4.7E-05	4.9E-08	7.3E-01	3.5E-08	Indeno(1,2,3-cd)pyrene	1.5E-05	6.1E-08	7.3E-01	4.5E-08	8.0E-08
Phenanthrene	1.0E-06	1.0E-09			Phenanthrene	3.2E-07	1.3E-09			
TH-TOTAL	5.0E-07	5.2E-10			TH-TOTAL	4.2E-07	1.7E-09			
U-TOTAL	3.7E-05	3.8E-08			U-TOTAL	1.1E-04	4.6E-07			
		Total Pathway:		6.4E-07			Total Pathway:		7.1E-07	
		Total Rad + Chem		6.5E-07			Total Rad + Chem		7.4E-07	*Total:* 1.4E-06

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TABLE B.3.5-16(a)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.4E-02	4.4E+01			CS-137	8.36E-03	6.1E+01			
NP-237	6.5E-05	1.2E-01			NP-237	5.93E-06	4.4E-02			
PU-238	2.8E-07	5.2E-04			PU-238	5.62E-08	4.1E-04			
PU-239/240	1.7E-07	3.1E-04			PU-239/240	3.37E-08	2.5E-04			
RA-226	1.4E-03	2.6E+00			RA-226	2.56E-03	1.9E+01			
RA-228	2.8E-04	5.2E-01			RA-228	5.09E-04	3.7E+00			
SR-90	1.0E-03	1.9E+00			SR-90	5.09E-03	3.7E+01			
TH-228	1.1E-05	2.0E-02			TH-228	9.04E-06	6.6E-02			
TH-230	8.9E-04	1.6E+00			TH-230	7.39E-04	5.4E+00			
TH-232	2.4E-05	4.4E-02			TH-232	1.98E-05	1.5E-01			
U-234	3.7E-03	6.7E+00			U-234	1.10E-02	8.1E+01			
U-235/236	3.0E-04	5.6E-01			U-235/236	9.12E-04	6.7E+00			
U-238	1.2E-02	2.3E+01			U-238	3.74E-02	2.7E+02			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.0E-06	1.0E-09			Aroclor-1254	3.2E-07	1.3E-09			
Arsenic	3.3E-05	3.4E-08	3.0E-04	1.1E-04	Arsenic	9.9E-07	4.1E-09	3.0E-04	1.4E-05	1.3E-04
Benzo(a)pyrene	2.5E-05	2.5E-08			Benzo(a)pyrene	7.8E-06	3.2E-08			
Benzo(a)anthracene	7.7E-06	7.9E-09			Benzo(a)anthracene	2.4E-06	1.0E-08			
Benzo(b)fluoranthene	2.3E-05	2.4E-08			Benzo(b)fluoranthene	7.2E-06	3.0E-08			
Benzo(g,h,i)perylene	1.8E-04	1.9E-07			Benzo(g,h,i)perylene	5.7E-05	2.4E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.2E-06	2.0E-02	5.8E-05	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-06	2.0E-02	7.3E-05	1.3E-04
Beryllium	5.8E-06	5.9E-09	5.0E-03	1.2E-06	Beryllium	5.2E-09	2.1E-11	5.0E-03	4.3E-09	1.2E-06
Lead	1.0E-04	1.1E-07			Lead	8.6E-05	3.5E-07			
Dibenzo(a,h)anthracene	3.9E-05	4.0E-08			Dibenzo(a,h)anthracene	1.2E-05	5.0E-08			
Indeno(1,2,3-cd)pyrene	4.7E-05	4.9E-08			Indeno(1,2,3-cd)pyrene	1.5E-05	6.1E-08			
Phenanthrene	1.0E-06	1.0E-09			Phenanthrene	3.2E-07	1.3E-09			
TH-TOTAL	5.0E-07	5.2E-10			TH-TOTAL	4.2E-07	1.7E-09			
U-TOTAL	3.7E-05	3.8E-08	3.0E-03	1.3E-05	U-TOTAL	1.1E-04	4.6E-07	3.0E-03	1.5E-04	1.7E-04
			Total Pathway:	1.9E-04				Total Pathway:	2.4E-04	
			Total Rad + Chem	1.9E-04				Total Rad + Chem	2.4E-04	*Total:* 4.3E-04

TABLE B.3.5-16(a)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.03E+01	1.9E+04	1.3E-12	2.5E-08

Total Pathway: 2.5E-08

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.25E+01	9.2E+04	1.3E-12	1.2E-07

Total Pathway: 1.2E-07

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 2.5E-08

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.2E-07

	Total	Total Dust & Groundwater Affected
CS-137		2.9E-09
NP-237		3.6E-11
PU-238		2.0E-13
PU-239/240		1.3E-13
RA-226		1.7E-08
RA-228		4.3E-10
SR-90		1.4E-09
TH-228		4.8E-12
TH-230		9.2E-11
TH-232		3.2E-11
U-234		1.4E-09
U-235/236		1.2E-10
U-238		8.3E-09
TC-99	1.4E-07	1.4E-07
		1.8E-08
		6.7E-08
		4.2E-07
		1.3E-08
		3.9E-08
		3.7E-08
		2.6E-08
		6.6E-07
		8.0E-08
Total:	1.4E-07	1.5E-06

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TABLE B.3.5-16(a)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n-(pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	1.0E+01	1.9E+04			TC-99	1.25E+01	9.2E+04				
Total Pathway:					Total Pathway:						

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			1.3E-04
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02			1.3E-04
Beryllium			5.0E-03		Beryllium			5.0E-03			1.2E-06
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			1.7E-04
Total Pathway:					Total Pathway:						
Total Rad + Chem					Total Rad + Chem					*Total:*	4.3E-04

TABLE B.3.5-16(b)
FUTURE, ON-PROPERTY [SOLID WASTE LANDFILL] CHILD
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.39E-02	1.5E+00	2.8E-11	4.1E-11	CS-137	8.36E-03	1.2E+01	2.8E-11	3.3E-10	3.8E-10
NP-237	6.52E-05	4.0E-03	2.2E-10	8.7E-13	NP-237	5.93E-06	8.5E-03	2.2E-10	1.9E-12	2.7E-12
PU-238	2.81E-07	1.7E-05	2.2E-10	3.8E-15	PU-238	5.62E-08	8.0E-05	2.2E-10	1.8E-14	2.1E-14
PU-239/240	1.68E-07	1.0E-05	2.3E-10	2.4E-15	PU-239/240	3.37E-08	4.8E-05	2.3E-10	1.1E-14	1.3E-14
RA-226	1.42E-03	8.6E-02	7.8E-10	6.7E-11	RA-226	2.56E-03	3.7E+00	7.8E-10	2.8E-09	2.9E-09
RA-228	2.83E-04	1.7E-02	1.0E-10	1.7E-12	RA-228	5.09E-04	7.3E-01	1.0E-10	7.3E-11	7.4E-11
SR-90	1.02E-03	6.2E-02	3.6E-11	2.2E-12	SR-90	5.09E-03	7.3E+00	3.6E-11	2.6E-10	2.6E-10
TH-228	1.09E-05	6.6E-04	5.5E-11	3.6E-14	TH-228	9.04E-06	1.3E-02	5.5E-11	7.1E-13	7.5E-13
TH-230	8.87E-04	5.4E-02	1.3E-11	7.0E-13	TH-230	7.39E-04	1.1E+00	1.3E-11	1.4E-11	1.4E-11
TH-232	2.37E-05	1.4E-03	1.7E-10	2.5E-13	TH-232	1.98E-05	2.8E-02	1.7E-10	4.8E-12	5.0E-12
U-234	3.67E-03	2.2E-01	1.6E-11	3.6E-12	U-234	1.10E-02	1.6E+01	1.6E-11	2.5E-10	2.5E-10
U-235/236	3.04E-04	1.9E-02	1.6E-11	3.0E-13	U-235/236	9.12E-04	1.3E+00	1.6E-11	2.1E-11	2.1E-11
U-238	1.25E-02	7.6E-01	2.8E-11	2.1E-11	U-238	3.74E-02	5.3E+01	2.8E-11	1.5E-09	1.5E-09
			Total Pathway:	1.4E-10				Total Pathway:	5.3E-09	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	1.0E-06	1.6E-10	7.7E+00	1.2E-09	Aroclor-1254	3.2E-07	1.2E-09	7.7E+00	9.3E-09	1.1E-08
Arsenic	3.3E-05	5.3E-09	1.8E+00	9.2E-09	Arsenic	9.9E-07	3.7E-09	1.8E+00	6.5E-09	1.6E-08
Benzo(a)pyrene	2.5E-05	3.9E-09	7.3E+00	2.8E-08	Benzo(a)pyrene	7.8E-06	2.9E-08	7.3E+00	2.1E-07	2.4E-07
Benzo(a)anthracene	7.7E-06	1.2E-09	7.3E-01	8.9E-10	Benzo(a)anthracene	2.4E-06	9.1E-09	7.3E-01	6.6E-09	7.5E-09
Benzo(b)fluoranthene	2.3E-05	3.6E-09	7.3E-01	2.7E-09	Benzo(b)fluoranthene	7.2E-06	2.7E-08	7.3E-01	2.0E-08	2.2E-08
Benzo(g,h,i)perylene	1.8E-04	2.9E-08			Benzo(g,h,i)perylene	5.7E-05	2.1E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.8E-07	1.4E-02	2.5E-09	bis(2-Ethylhexyl)phthalate	3.6E-04	1.3E-06	1.4E-02	1.9E-08	2.1E-08
Beryllium	5.8E-06	9.2E-10	4.3E+00	3.9E-09	Beryllium	5.2E-09	1.9E-11	4.3E+00	8.3E-11	4.0E-09
Lead	1.0E-04	1.6E-08			Lead	8.6E-05	3.2E-07			
Dibenzo(a,h)anthracene	3.9E-05	6.2E-09	7.3E+00	4.5E-08	Dibenzo(a,h)anthracene	1.2E-05	4.6E-08	7.3E+00	3.3E-07	3.8E-07
Indeno(1,2,3-cd)pyrene	4.7E-05	7.5E-09	7.3E-01	5.5E-09	Indeno(1,2,3-cd)pyrene	1.5E-05	5.6E-08	7.3E-01	4.1E-08	4.6E-08
Phenanthrene	1.0E-06	1.6E-10			Phenanthrene	3.2E-07	1.2E-09			
TH-TOTAL	5.0E-07	8.0E-11			TH-TOTAL	4.2E-07	1.6E-09			
U-TOTAL	3.7E-05	5.9E-09			U-TOTAL	1.1E-04	4.2E-07			
			Total Pathway:	9.9E-08				Total Pathway:	6.5E-07	

Total Rad + Chem 1.0E-07 | Total Rad + Chem 6.5E-07 | *Total:* 7.5E-07

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TABLE B.3.5-16(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.4E-02	1.5E+00			CS-137	8.36E-03	1.2E+01			
NP-237	6.5E-05	4.0E-03			NP-237	5.93E-06	8.5E-03			
PU-238	2.8E-07	1.7E-05			PU-238	5.62E-08	8.0E-05			
PU-239/240	1.7E-07	1.0E-05			PU-239/240	3.37E-08	4.8E-05			
RA-226	1.4E-03	8.6E-02			RA-226	2.56E-03	3.7E+00			
RA-228	2.8E-04	1.7E-02			RA-228	5.09E-04	7.3E-01			
SR-90	1.0E-03	6.2E-02			SR-90	5.09E-03	7.3E+00			
TH-228	1.1E-05	6.6E-04			TH-228	9.04E-06	1.3E-02			
TH-230	8.9E-04	5.4E-02			TH-230	7.39E-04	1.1E+00			
TH-232	2.4E-05	1.4E-03			TH-232	1.98E-05	2.8E-02			
U-234	3.7E-03	2.2E-01			U-234	1.10E-02	1.6E+01			
U-235/236	3.0E-04	1.9E-02			U-235/236	9.12E-04	1.3E+00			
U-238	1.2E-02	7.6E-01			U-238	3.74E-02	5.3E+01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.0E-06	1.9E-09			Aroclor-1254	3.2E-07	1.4E-08			
Arsenic	3.3E-05	6.1E-08	3.0E-04	2.0E-04	Arsenic	9.9E-07	4.3E-08	3.0E-04	1.4E-04	3.5E-04
Benzo(a)pyrene	2.5E-05	4.5E-08			Benzo(a)pyrene	7.8E-06	3.4E-07			
Benzo(a)anthracene	7.7E-06	1.4E-08			Benzo(a)anthracene	2.4E-06	1.1E-07			
Benzo(b)fluoranthene	2.3E-05	4.2E-08			Benzo(b)fluoranthene	7.2E-06	3.1E-07			
Benzo(g,h,i)perylene	1.8E-04	3.4E-07			Benzo(g,h,i)perylene	5.7E-05	2.5E-06			
bis(2-Ethylhexyl)phthalate	1.1E-03	2.1E-06	2.0E-02	1.0E-04	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-05	2.0E-02	7.7E-04	8.8E-04
Beryllium	5.8E-06	1.1E-08	5.0E-03	2.1E-06	Beryllium	5.2E-09	2.3E-10	5.0E-03	4.5E-08	2.2E-06
Lead	1.0E-04	1.9E-07			Lead	8.6E-05	3.8E-06			
Dibenzo(a,h)anthracene	3.9E-05	7.2E-08			Dibenzo(a,h)anthracene	1.2E-05	5.3E-07			
Indeno(1,2,3-cd)pyrene	4.7E-05	8.8E-08			Indeno(1,2,3-cd)pyrene	1.5E-05	6.5E-07			
Phenanthrene	1.0E-06	1.9E-09			Phenanthrene	3.2E-07	1.4E-08			
TH-TOTAL	5.0E-07	9.3E-10			TH-TOTAL	4.2E-07	1.8E-08			
U-TOTAL	3.7E-05	6.9E-08	3.0E-03	2.3E-05	U-TOTAL	1.1E-04	4.9E-06	3.0E-03	1.6E-03	1.6E-03
			Total Pathway:	3.3E-04				Total Pathway:	2.5E-03	
			Total Rad + Chem	3.3E-04				Total Rad + Chem	2.5E-03	*Total:* 2.9E-03

TABLE B.3.5-16(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.03E+01	6.3E+02	1.3E-12	8.2E-10

Total Pathway: 8.2E-10

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.25E+01	1.8E+04	1.3E-12	2.3E-08

Total Pathway: 2.3E-08

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 8.2E-10

Total Rad + Chem 2.3E-08

	Total	Total Dust & Groundwater Affected
CS-137		3.8E-10
NP-237		2.7E-12
PU-238		2.1E-14
PU-239/240		1.3E-14
RA-226		2.9E-09
RA-228		7.4E-11
SR-90		2.6E-10
TH-228		7.5E-13
TH-230		1.4E-11
TH-232		5.0E-12
U-234		2.5E-10
U-235/236		2.1E-11
U-238		1.5E-09
TC-99	2.4E-08	2.4E-08
Aroclor-1254		1.1E-08
Arsenic		1.6E-08
Benzo(a)pyrene		2.4E-07
Benzo(a)anthracene		7.5E-09
Benzo(b)fluoranthene		2.2E-08
Benzo(g,h,i)perylene		
bis(2-Ethylhexyl)phthalate		2.1E-08
Beryllium		4.0E-09
Lead		
Dibenzo(a,h)anthracene		3.8E-07
Indeno(1,2,3-cd)pyrene		4.6E-08
Phenanthrene		
TH-TOTAL		
U-TOTAL		
Total:	2.4E-08	7.8E-07

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TABLE B.3.5-16(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	1.0E+01	6.3E+02			TC-99	1.25E+01	1.8E+04				
Total Pathway:					Total Pathway:						

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			3.5E-04
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02			8.8E-04
Beryllium			5.0E-03		Beryllium			5.0E-03			2.2E-06
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			1.6E-03
Total Pathway:					Total Pathway:						
Total Rad + Chem					Total Rad + Chem					*Total:*	2.9E-03

TABLE B.3.5-17 (a)

FUTURE ON-PROPERTY [SOLID WASTE LANDFILL] FARMER (RME VALUES)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	7.27E-06	1.4E+01	2.8E-11	4.0E-10	CS-137	7.26E-06	7.6E+00	2.8E-11	2.1E-10	6.1E-10
NP-237	5.85E-06	1.2E+01	2.2E-10	2.5E-09	NP-237	5.85E-06	6.1E+00	2.2E-10	1.3E-09	3.9E-09
PU-238	4.23E-06	8.3E+00	2.2E-10	1.8E-09	PU-238	4.23E-06	4.4E+00	2.2E-10	9.7E-10	2.8E-09
PU-239/240	1.00E-06	2.0E+00	2.3E-10	4.5E-10	PU-239/240	1.00E-06	1.0E+00	2.3E-10	2.4E-10	6.9E-10
RA-226	1.64E-05	3.2E+01	7.8E-10	2.5E-08	RA-226	1.64E-05	1.7E+01	7.8E-10	1.3E-08	3.8E-08
RA-228	1.21E-05	2.4E+01	1.0E-10	2.4E-09	RA-228	1.20E-05	1.2E+01	1.0E-10	1.2E-09	3.6E-09
SR-90	8.24E-06	1.6E+01	3.6E-11	5.8E-10	SR-90	8.22E-06	8.6E+00	3.6E-11	3.1E-10	8.9E-10
TH-228	2.14E-05	4.2E+01	5.5E-11	2.3E-09	TH-228	2.08E-05	2.2E+01	5.5E-11	1.2E-09	3.5E-09
TH-230	3.37E-04	6.6E+02	1.3E-11	8.6E-09	TH-230	3.37E-04	3.5E+02	1.3E-11	4.6E-09	1.3E-08
TH-232	9.80E-06	1.9E+01	1.7E-10	3.3E-09	TH-232	9.80E-06	1.0E+01	1.7E-10	1.7E-09	5.0E-09
U-234	1.63E-04	3.2E+02	1.6E-11	5.1E-09	U-234	1.63E-04	1.7E+02	1.6E-11	2.7E-09	7.9E-09
U-235/236	1.35E-05	2.7E+01	1.6E-11	4.3E-10	U-235/236	1.35E-05	1.4E+01	1.6E-11	2.3E-10	6.5E-10
U-238	5.54E-04	1.1E+03	2.8E-11	3.1E-08	U-238	5.54E-04	5.8E+02	2.8E-11	1.6E-08	4.7E-08
			Total Pathway:	8.4E-08				Total Pathway:	4.4E-08	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.33E-07	4.8E-10	7.7E+00	3.7E-09	Aroclor-1254	4.33E-07	2.5E-10	7.7E+00	1.9E-09	5.6E-09
Arsenic	6.51E-05	7.2E-08	1.8E+00	1.3E-07	Arsenic	6.51E-05	3.8E-08	1.8E+00	6.6E-08	1.9E-07
Benzo(a)pyrene	8.42E-06	9.3E-09	7.3E+00	6.8E-08	Benzo(a)pyrene	8.36E-06	4.9E-09	7.3E+00	3.6E-08	1.0E-07
Benzo(a)anthracene	7.22E-06	8.0E-09	7.3E-01	5.8E-09	Benzo(a)anthracene	7.17E-06	4.2E-09	7.3E-01	3.1E-09	8.9E-09
Benzo(b)fluoranthene	7.60E-06	8.4E-09	7.3E-01	6.1E-09	Benzo(b)fluoranthene	7.53E-06	4.4E-09	7.3E-01	3.2E-09	9.3E-09
Benzo(g,h,i)perylene	4.69E-06	5.2E-09			Benzo(g,h,i)perylene	4.66E-06	2.7E-09			
bis(2-Ethylhexyl)phthalate	7.35E-05	8.1E-08	1.4E-02	1.1E-09	bis(2-Ethylhexyl)phthalate	7.35E-05	4.3E-08	1.4E-02	6.0E-10	1.7E-09
Beryllium	1.42E-05	1.6E-08	4.3E+00	6.7E-08	Beryllium	1.42E-05	8.3E-09	4.3E+00	3.6E-08	1.0E-07
Lead	6.61E-04	7.3E-07			Lead	6.61E-04	3.9E-07			
Dibenzo(a,h)anthracene	2.40E-06	2.6E-09	7.3E+00	1.9E-08	Dibenzo(a,h)anthracene	2.39E-06	1.4E-09	7.3E+00	1.0E-08	2.9E-08
Indeno(1,2,3-cd)pyrene	5.40E-06	6.0E-09	7.3E-01	4.3E-09	Indeno(1,2,3-cd)pyrene	5.37E-06	3.1E-09	7.3E-01	2.3E-09	6.6E-09
Phenanthrene	1.25E-05	1.4E-08			Phenanthrene	1.22E-05	7.1E-09			
TH-TOTAL	1.90E-04	2.1E-07			TH-TOTAL	1.90E-04	1.1E-07			
U-TOTAL	1.66E-03	1.8E-06			U-TOTAL	1.66E-03	9.7E-07			
			Total Pathway:	3.0E-07				Total Pathway:	1.6E-07	

Total Rad + Chem 3.8E-07 | Total Rad + Chem 2.0E-07 | *Total:* 5.9E-07

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TABLE B.3.5-17 (a)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			6.1E-10
NP-237			2.2E-10		NP-237			2.2E-10			3.9E-09
PU-238			2.2E-10		PU-238			2.2E-10			2.8E-09
PU-239/240			2.3E-10		PU-239/240			2.3E-10			6.9E-10
RA-226			7.8E-10		RA-226			7.8E-10			3.8E-08
RA-228			1.0E-10		RA-228			1.0E-10			3.6E-09
SR-90			3.6E-11		SR-90			3.6E-11			8.9E-10
TH-228			5.5E-11		TH-228			5.5E-11			3.5E-09
TH-230			1.3E-11		TH-230			1.3E-11			1.3E-08
TH-232			1.7E-10		TH-232			1.7E-10			5.0E-09
U-234			1.6E-11		U-234			1.6E-11			7.9E-09
U-235/236			1.6E-11		U-235/236			1.6E-11			6.5E-10
U-238			2.8E-11		U-238			2.8E-11			4.7E-08
TC-99	1.54E-02	3.0E+04	1.3E-12	4.0E-08	TC-99	1.54E-02	1.6E+04	1.3E-12	2.1E-08	6.1E-08	6.1E-08
			Total Pathway:	4.0E-08				Total Pathway:	2.1E-08		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			5.6E-09
Arsenic			1.8E+00		Arsenic			1.8E+00			1.9E-07
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			1.0E-07
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			8.9E-09
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			9.3E-09
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalate			1.4E-02		bis(2-Ethylhexyl)phthalate			1.4E-02			1.7E-09
Beryllium			4.3E+00		Beryllium			4.3E+00			1.0E-07
Lead					Lead						
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			2.9E-08
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			6.6E-09
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL					U-TOTAL						
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	4.0E-08				Total Rad + Chem	2.1E-08	*Total:* 6.1E-08	6.5E-07

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TABLE B.3.5-17 (a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	7.3E-06	1.4E+01			CS-137	7.26E-06	7.6E+00			
NP-237	5.8E-06	1.2E+01			NP-237	5.85E-06	6.1E+00			
PU-238	4.2E-06	8.3E+00			PU-238	4.23E-06	4.4E+00			
PU-239/240	1.0E-06	2.0E+00			PU-239/240	1.00E-06	1.0E+00			
RA-226	1.6E-05	3.2E+01			RA-226	1.64E-05	1.7E+01			
RA-228	1.2E-05	2.4E+01			RA-228	1.20E-05	1.2E+01			
SR-90	8.2E-06	1.6E+01			SR-90	8.22E-06	8.6E+00			
TH-228	2.1E-05	4.2E+01			TH-228	2.08E-05	2.2E+01			
TH-230	3.4E-04	6.6E+02			TH-230	3.37E-04	3.5E+02			
TH-232	9.8E-06	1.9E+01			TH-232	9.80E-06	1.0E+01			
U-234	1.6E-04	3.2E+02			U-234	1.63E-04	1.7E+02			
U-235/236	1.4E-05	2.7E+01			U-235/236	1.35E-05	1.4E+01			
U-238	5.5E-04	1.1E+03			U-238	5.54E-04	5.8E+02			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.3E-07	4.8E-10			Aroclor-1254	4.33E-07	2.5E-10			
Arsenic	6.5E-05	7.2E-08	3.0E-04	2.4E-04	Arsenic	6.51E-05	3.8E-08	3.0E-04	1.3E-04	3.7E-04
Benzo(a)pyrene	8.4E-06	9.3E-09			Benzo(a)pyrene	8.36E-06	4.9E-09			
Benzo(a)anthracene	7.2E-06	8.0E-09			Benzo(a)anthracene	7.17E-06	4.2E-09			
Benzo(b)fluoranthene	7.6E-06	8.4E-09			Benzo(b)fluoranthene	7.53E-06	4.4E-09			
Benzo(g,h,i)perylene	4.7E-06	5.2E-09			Benzo(g,h,i)perylene	4.66E-06	2.7E-09			
bis(2-Ethylhexyl)phthalat	7.4E-05	8.1E-08	2.0E-02	4.0E-06	bis(2-Ethylhexyl)phthalat	7.35E-05	4.3E-08	2.0E-02	2.1E-06	6.2E-06
Beryllium	1.4E-05	1.6E-08	5.0E-03	3.1E-06	Beryllium	1.42E-05	8.3E-09	5.0E-03	1.7E-06	4.8E-06
Lead	6.6E-04	7.3E-07			Lead	6.61E-04	3.9E-07			
Dibenzo(a,h)anthracene	2.4E-06	2.6E-09			Dibenzo(a,h)anthracene	2.39E-06	1.4E-09			
Indeno(1,2,3-cd)pyrene	5.4E-06	6.0E-09			Indeno(1,2,3-cd)pyrene	5.37E-06	3.1E-09			
Phenanthrene	1.3E-05	1.4E-08			Phenanthrene	1.22E-05	7.1E-09			
TH-TOTAL	1.9E-04	2.1E-07			TH-TOTAL	1.90E-04	1.1E-07			
U-TOTAL	1.7E-03	1.8E-06	3.0E-03	6.1E-04	U-TOTAL	1.66E-03	9.7E-07	3.0E-03	3.2E-04	9.3E-04
			Total Pathway:	8.6E-04				Total Pathway:	4.5E-04	
			Total Rad + Chem	8.6E-04				Total Rad + Chem	4.5E-04	*Total:* 1.3E-03

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TABLE B.3.5-17 (a)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.5E-02	3.0E+04		
Total Pathway:				

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.54E-02	1.6E+04		
Total Pathway:				

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	
Total Pathway:				

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	
Total Pathway:				

	Total	Total Dust & Groundwater Affected
		3.7E-04
		6.2E-06
		4.8E-06
		9.3E-04
Total Rad + Chem		
Total Rad + Chem		
Total:		1.3E-03

TABLE B.3.5-17(b)

FUTURE ON-PROPERTY [SOLID WASTE LANDFILL] CHILD

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	7.27E-06	6.1E-01	2.8E-11	1.7E-11	CS-137	7.26E-06	9.3E-01	2.8E-11	2.6E-11	4.3E-11
NP-237	5.85E-06	4.9E-01	2.2E-10	1.1E-10	NP-237	5.85E-06	7.5E-01	2.2E-10	1.7E-10	2.7E-10
PU-238	4.23E-06	3.6E-01	2.2E-10	7.8E-11	PU-238	4.23E-06	5.4E-01	2.2E-10	1.2E-10	2.0E-10
PU-239/240	1.00E-06	8.4E-02	2.3E-10	1.9E-11	PU-239/240	1.00E-06	1.3E-01	2.3E-10	3.0E-11	4.9E-11
RA-226	1.64E-05	1.4E+00	7.8E-10	1.1E-09	RA-226	1.64E-05	2.1E+00	7.8E-10	1.6E-09	2.7E-09
RA-228	1.21E-05	1.0E+00	1.0E-10	1.0E-10	RA-228	1.20E-05	1.5E+00	1.0E-10	1.5E-10	2.6E-10
SR-90	8.24E-06	6.9E-01	3.6E-11	2.5E-11	SR-90	8.22E-06	1.1E+00	3.6E-11	3.8E-11	6.3E-11
TH-228	2.14E-05	1.8E+00	5.5E-11	9.9E-11	TH-228	2.08E-05	2.7E+00	5.5E-11	1.5E-10	2.5E-10
TH-230	3.37E-04	2.8E+01	1.3E-11	3.7E-10	TH-230	3.37E-04	4.3E+01	1.3E-11	5.6E-10	9.3E-10
TH-232	9.80E-06	8.2E-01	1.7E-10	1.4E-10	TH-232	9.80E-06	1.3E+00	1.7E-10	2.1E-10	3.5E-10
U-234	1.63E-04	1.4E+01	1.6E-11	2.2E-10	U-234	1.63E-04	2.1E+01	1.6E-11	3.4E-10	5.5E-10
U-235/236	1.35E-05	1.1E+00	1.6E-11	1.8E-11	U-235/236	1.35E-05	1.7E+00	1.6E-11	2.8E-11	4.6E-11
U-238	5.54E-04	4.7E+01	2.8E-11	1.3E-09	U-238	5.54E-04	7.1E+01	2.8E-11	2.0E-09	3.3E-09
			Total Pathway:	3.6E-09				Total Pathway:	5.5E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.33E-07	9.5E-11	7.7E+00	7.3E-10	Aroclor-1254	4.33E-07	1.5E-10	7.7E+00	1.1E-09	1.8E-09
Arsenic	6.51E-05	1.4E-08	1.8E+00	2.5E-08	Arsenic	6.51E-05	2.2E-08	1.8E+00	3.8E-08	6.3E-08
Benzo(a)pyrene	8.42E-06	1.8E-09	7.3E+00	1.3E-08	Benzo(a)pyrene	8.36E-06	2.8E-09	7.3E+00	2.0E-08	3.4E-08
Benzo(a)anthracene	7.22E-06	1.6E-09	7.3E-01	1.2E-09	Benzo(a)anthracene	7.17E-06	2.4E-09	7.3E-01	1.8E-09	2.9E-09
Benzo(b)fluoranthene	7.60E-06	1.7E-09	7.3E-01	1.2E-09	Benzo(b)fluoranthene	7.53E-06	2.5E-09	7.3E-01	1.8E-09	3.1E-09
Benzo(g,h,i)perylene	4.69E-06	1.0E-09			Benzo(g,h,i)perylene	4.66E-06	1.6E-09			
bis(2-Ethylhexyl)phthalate	7.35E-05	1.6E-08	1.4E-02	2.3E-10	bis(2-Ethylhexyl)phthalate	7.35E-05	2.5E-08	1.4E-02	3.5E-10	5.7E-10
Beryllium	1.42E-05	3.1E-09	4.3E+00	1.3E-08	Beryllium	1.42E-05	4.8E-09	4.3E+00	2.1E-08	3.4E-08
Lead	6.61E-04	1.4E-07			Lead	6.61E-04	2.2E-07			
Dibenzo(a,h)anthracene	2.40E-06	5.3E-10	7.3E+00	3.8E-09	Dibenzo(a,h)anthracene	2.39E-06	8.0E-10	7.3E+00	5.8E-09	9.7E-09
Indeno(1,2,3-cd)pyrene	5.40E-06	1.2E-09	7.3E-01	8.6E-10	Indeno(1,2,3-cd)pyrene	5.37E-06	1.8E-09	7.3E-01	1.3E-09	2.2E-09
Phenanthrene	1.25E-05	2.7E-09			Phenanthrene	1.22E-05	4.1E-09			
TH-TOTAL	1.90E-04	4.2E-08			TH-TOTAL	1.90E-04	6.4E-08			
U-TOTAL	1.66E-03	3.6E-07			U-TOTAL	1.66E-03	5.6E-07			
			Total Pathway:	6.0E-08				Total Pathway:	9.1E-08	

Total Rad + Chem	6.3E-08	Total Rad + Chem	9.7E-08	*Total:* 1.6E-07

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TABLE B.3.5-17(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	7.3E-06	6.1E-01		
NP-237	5.8E-06	4.9E-01		
PU-238	4.2E-06	3.6E-01		
PU-239/240	1.0E-06	8.4E-02		
RA-226	1.6E-05	1.4E+00		
RA-228	1.2E-05	1.0E+00		
SR-90	8.2E-06	6.9E-01		
TH-228	2.1E-05	1.8E+00		
TH-230	3.4E-04	2.8E+01		
TH-232	9.8E-06	8.2E-01		
U-234	1.6E-04	1.4E+01		
U-235/236	1.4E-05	1.1E+00		
U-238	5.5E-04	4.7E+01		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	7.26E-06	9.3E-01		
NP-237	5.85E-06	7.5E-01		
PU-238	4.23E-06	5.4E-01		
PU-239/240	1.00E-06	1.3E-01		
RA-226	1.64E-05	2.1E+00		
RA-228	1.20E-05	1.5E+00		
SR-90	8.22E-06	1.1E+00		
TH-228	2.08E-05	2.7E+00		
TH-230	3.37E-04	4.3E+01		
TH-232	9.80E-06	1.3E+00		
U-234	1.63E-04	2.1E+01		
U-235/236	1.35E-05	1.7E+00		
U-238	5.54E-04	7.1E+01		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	4.3E-07	1.11E-09		
Arsenic	6.5E-05	1.66E-07	3.0E-04	5.5E-04
Benzo(a)pyrene	8.4E-06	2.15E-08		
Benzo(a)anthracene	7.2E-06	1.85E-08		
Benzo(b)fluoranthene	7.6E-06	1.94E-08		
Benzo(g,h,i)perylene	4.7E-06	1.20E-08		
bis(2-Ethylhexyl)phthalat	7.4E-05	1.88E-07	2.0E-02	9.4E-06
Beryllium	1.4E-05	3.64E-08	5.0E-03	7.3E-06
Lead	6.6E-04	1.69E-06		
Dibenzo(a,h)anthracene	2.4E-06	6.13E-09		
Indeno(1,2,3-cd)pyrene	5.4E-06	1.38E-08		
Phenanthrene	1.3E-05	3.20E-08		
TH-TOTAL	1.9E-04	4.86E-07		
U-TOTAL	1.7E-03	4.25E-06	3.0E-03	1.4E-03

Total Pathway: 2.0E-03

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	Total
Aroclor-1254	4.33E-07	1.7E-09			
Arsenic	6.51E-05	2.5E-07	3.0E-04	8.5E-04	1.4E-03
Benzo(a)pyrene	8.36E-06	3.3E-08			
Benzo(a)anthracene	7.17E-06	2.8E-08			
Benzo(b)fluoranthene	7.53E-06	2.9E-08			
Benzo(g,h,i)perylene	4.66E-06	1.8E-08			
bis(2-Ethylhexyl)phthalat	7.35E-05	2.9E-07	2.0E-02	1.4E-05	2.4E-05
Beryllium	1.42E-05	5.6E-08	5.0E-03	1.1E-05	1.8E-05
Lead	6.61E-04	2.6E-06			
Dibenzo(a,h)anthracene	2.39E-06	9.3E-09			
Indeno(1,2,3-cd)pyrene	5.37E-06	2.1E-08			
Phenanthrene	1.22E-05	4.8E-08			
TH-TOTAL	1.90E-04	7.4E-07			
U-TOTAL	1.66E-03	6.5E-06	3.0E-03	2.2E-03	3.6E-03

Total Pathway: 3.0E-03

Total Rad + Chem 2.0E-03

Total Rad + Chem 3.0E-03 *Total:* 5.0E-03

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TABLE B.3.5-17(b)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.54E-02	1.3E+03	1.3E-12	1.7E-09
			Total Pathway:	1.7E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.54E-02	2.0E+03	1.3E-12	2.6E-09
			Total Pathway:	2.6E-09

Total	Total Dust & Groundwater Affected
	4.3E-11
	2.7E-10
	2.0E-10
	4.9E-11
	2.7E-09
	2.6E-10
	6.3E-11
	2.5E-10
	9.3E-10
	3.5E-10
	5.5E-10
	4.6E-11
	3.3E-09
4.3E-09	4.3E-09

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	
			Total Rad + Chem	1.7E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	
			Total Rad + Chem	2.6E-09

		1.8E-09
		6.3E-08
		3.4E-08
		2.9E-09
		3.1E-09
		5.7E-10
		3.4E-08
		9.7E-09
		2.2E-09
Total:	4.3E-09	1.6E-07

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TABLE B.3.5-17(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	Total	Affected
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90					SR-90						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234					U-234						
U-235/236					U-235/236						
U-238					U-238						
TC-99	1.5E-02				TC-99	1.54E-02					
			Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	Total	Affected
Aroclor-1254					Aroclor-1254						
Arsenic			3.0E-04		Arsenic			3.0E-04			1.4E-03
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
bis(2-Ethylhexyl)phthalat			2.0E-02		bis(2-Ethylhexyl)phthalat			2.0E-02			2.4E-05
Beryllium			5.0E-03		Beryllium			5.0E-03			1.8E-05
Lead					Lead						
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene						
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene						
Phenanthrene					Phenanthrene						
TH-TOTAL					TH-TOTAL						
U-TOTAL			3.0E-03		U-TOTAL			3.0E-03			3.6E-03
			Total Pathway:					Total Pathway:			
			Total Rad + Chem					Total Rad + Chem		*Total:*	5.0E-03

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TABLE B.3.5-17(c)
FUTURE, ON-PROPERTY FARMER (RME VALUES)
LIME SLUDGE PONDS: GROUNDWATER

Carcinogenic Risk

Radiation Risk									
Ingestion/Groundwater					Inhalation/Groundwater		Dermal Contact/Groundwater		**Total**
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk					
TC-99	3.0E+00	1.5E+05	1.3E-12	1.9E-07	Not applicable		Not applicable		1.9E-07
			Total Pathway:	1.9E-07	Total Pathway:	0.0E+00	Total Pathway:	0.0E+00	
			Total Rad + Chem	1.9E-07	Total Rad + Chem	0.0E+00	Total Rad + Chem	0.0E+00	*Total:* 1.9E-07

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TABLE B.3.5-17(d)
FUTURE, ON-PROPERTY [SOLID WASTE LANDFILL] CHILD
LIME SLUDGE PONDS: GROUNDWATER

Carcinogenic Risk

Radiation Risk								
Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater		Total
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk				
TC-99	3.0E+00	6.2E+03	1.3E-12	8.1E-09	Not applicable	Not applicable		8.1E-09
			Total Pathway:	8.1E-09	Total Pathway: 0.0E+00	Total Pathway:	0.0E+00	
			Total Rad + Chem	8.1E-09	Total Rad + Chem 0.0E+00	Total Rad + Chem	0.0E+00	*Total:* 8.1E-09

TABLE B.3.5-18
FUTURE ON-PROPERTY FARMER (CT VALUES)
LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.05E-05	9.0E-02	1.9E-11	1.7E-12	1.7E-12
NP-237	1.08E-05	9.3E-02	2.9E-08	2.7E-09	2.7E-09
PU-238	8.64E-06	7.4E-02	3.9E-08	2.9E-09	2.9E-09
PU-239/240	2.03E-06	1.7E-02	3.8E-08	6.6E-10	6.6E-10
RA-226	2.88E-05	2.5E-01	7.0E-09	1.7E-09	1.7E-09
RA-228	2.46E-05	2.1E-01	6.9E-10	1.5E-10	1.5E-10
SR-90	1.18E-05	1.0E-01	6.2E-11	6.3E-12	6.3E-12
TH-228	4.37E-05	3.7E-01	7.8E-08	2.9E-08	2.9E-08
TH-230	6.72E-04	5.8E+00	2.9E-08	1.7E-07	1.7E-07
TH-232	1.96E-05	1.7E-01	1.1E-07	1.8E-08	1.8E-08
U-234	3.15E-04	2.7E+00	2.6E-08	7.0E-08	7.0E-08
U-235/236	2.61E-05	2.2E-01	2.5E-08	5.6E-09	5.6E-09
U-238	1.07E-03	9.2E+00	5.2E-08	4.8E-07	4.8E-07
			Total Pathway:	7.7E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	8.85E-10	4.2E-12			
Arsenic	1.08E-07	5.2E-10	1.5E+01	7.8E-09	7.8E-09
Benzo(a)pyrene	1.65E-08	7.9E-11	6.1E+00	4.8E-10	4.8E-10
Benzo(a)anthracene	1.37E-08	6.6E-11	6.1E-01	4.0E-11	4.0E-11
Benzo(b)fluoranthene	1.50E-08	7.2E-11	6.1E-01	4.4E-11	4.4E-11
Benzo(g,h,i)perylene	9.51E-09	4.6E-11			
bis(2-Ethylhexyl)phthalate	1.50E-07	7.2E-10			
Beryllium	2.28E-08	1.1E-10	8.4E+00	9.2E-10	9.2E-10
Lead	4.13E-07	2.0E-09			
Dibenzo(a,h)anthracene	4.80E-09	2.3E-11	6.1E+00	1.4E-10	1.4E-10
Indeno(1,2,3-cd)pyrene	1.08E-08	5.2E-11	6.1E-01	3.2E-11	3.2E-11
Phenanthrene	2.42E-08	1.2E-10			
TH-TOTAL	3.79E-07	1.8E-09			
U-TOTAL	3.21E-06	1.5E-08			
			Total Pathway:	9.4E-09	

Total Rad + Chem 7.8E-07 *Total:* 7.8E-07

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TABLE B.3.5-18
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.05E-05	9.0E-02		
NP-237	1.08E-05	9.3E-02		
PU-238	8.64E-06	7.4E-02		
PU-239/240	2.03E-06	1.7E-02		
RA-226	2.88E-05	2.5E-01		
RA-228	2.46E-05	2.1E-01		
SR-90	1.18E-05	1.0E-01		
TH-228	4.37E-05	3.7E-01		
TH-230	6.72E-04	5.8E+00		
TH-232	1.96E-05	1.7E-01		
U-234	3.15E-04	2.7E+00		
U-235/236	2.61E-05	2.2E-01		
U-238	1.07E-03	9.2E+00		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.85E-10	3.3E-11		
Arsenic	1.08E-07	4.0E-09		
Benzo(a)pyrene	1.65E-08	6.1E-10		
Benzo(a)anthracene	1.37E-08	5.1E-10		
Benzo(b)fluoranthene	1.50E-08	5.6E-10		
Benzo(g,h,i)perylene	9.51E-09	3.5E-10		
bis(2-Ethylhexyl)phthalate	1.50E-07	5.6E-09		
Beryllium	2.28E-08	8.5E-10		
Lead	4.13E-07	1.5E-08		
Dibenzo(a,h)anthracene	4.80E-09	1.8E-10		
Indeno(1,2,3-cd)pyrene	1.08E-08	4.0E-10		
Phenanthrene	2.42E-08	9.0E-10		
TH-TOTAL	3.79E-07	1.4E-08		
U-TOTAL	3.21E-06	1.2E-07		

Total Pathway:

Total Rad + Chem

Total

Total:

TABLE B.3.5-19

FUTURE ON-PROPERTY [SOLID WASTE LANDFILL] FARMER (CT VALUES)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	7.27E-06	7.7E-01	2.8E-11	2.2E-11	CS-137	7.26E-06	4.3E-01	2.8E-11	1.2E-11	3.4E-11
NP-237	5.85E-06	6.2E-01	2.2E-10	1.4E-10	NP-237	5.85E-06	3.5E-01	2.2E-10	7.7E-11	2.1E-10
PU-238	4.23E-06	4.5E-01	2.2E-10	9.9E-11	PU-238	4.23E-06	2.5E-01	2.2E-10	5.6E-11	1.5E-10
PU-239/240	1.00E-06	1.1E-01	2.3E-10	2.4E-11	PU-239/240	1.00E-06	6.0E-02	2.3E-10	1.4E-11	3.8E-11
RA-226	1.64E-05	1.7E+00	7.8E-10	1.4E-09	RA-226	1.64E-05	9.8E-01	7.8E-10	7.6E-10	2.1E-09
RA-228	1.21E-05	1.3E+00	1.0E-10	1.3E-10	RA-228	1.20E-05	7.2E-01	1.0E-10	7.2E-11	2.0E-10
SR-90	8.24E-06	8.7E-01	3.6E-11	3.1E-11	SR-90	8.22E-06	4.9E-01	3.6E-11	1.8E-11	4.9E-11
TH-228	2.14E-05	2.3E+00	5.5E-11	1.2E-10	TH-228	2.08E-05	1.2E+00	5.5E-11	6.8E-11	1.9E-10
TH-230	3.37E-04	3.6E+01	1.3E-11	4.6E-10	TH-230	3.37E-04	2.0E+01	1.3E-11	2.6E-10	7.3E-10
TH-232	9.80E-06	1.0E+00	1.7E-10	1.8E-10	TH-232	9.80E-06	5.9E-01	1.7E-10	1.0E-10	2.8E-10
U-234	1.63E-04	1.7E+01	1.6E-11	2.8E-10	U-234	1.63E-04	9.8E+00	1.6E-11	1.6E-10	4.3E-10
U-235/236	1.35E-05	1.4E+00	1.6E-11	2.3E-11	U-235/236	1.35E-05	8.1E-01	1.6E-11	1.3E-11	3.6E-11
U-238	5.54E-04	5.9E+01	2.8E-11	1.6E-09	U-238	5.54E-04	3.3E+01	2.8E-11	9.3E-10	2.6E-09
			Total Pathway:	4.5E-09				Total Pathway:	2.5E-09	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.33E-07	2.6E-11	7.7E+00	2.0E-10	Aroclor-1254	4.33E-07	1.4E-11	7.7E+00	1.1E-10	3.1E-10
Arsenic	6.51E-05	3.9E-09	1.8E+00	6.7E-09	Arsenic	6.51E-05	2.2E-09	1.8E+00	3.8E-09	1.1E-08
Benzo(a)pyrene	8.42E-06	5.0E-10	7.3E+00	3.6E-09	Benzo(a)pyrene	8.36E-06	2.8E-10	7.3E+00	2.0E-09	5.7E-09
Benzo(a)anthracene	7.22E-06	4.3E-10	7.3E-01	3.1E-10	Benzo(a)anthracene	7.17E-06	2.4E-10	7.3E-01	1.8E-10	4.9E-10
Benzo(b)fluoranthene	7.60E-06	4.5E-10	7.3E-01	3.3E-10	Benzo(b)fluoranthene	7.53E-06	2.5E-10	7.3E-01	1.8E-10	5.1E-10
Benzo(g,h,i)perylene	4.69E-06	2.8E-10			Benzo(g,h,i)perylene	4.66E-06	1.6E-10			
bis(2-Ethylhexyl)phthalate	7.35E-05	4.3E-09	1.4E-02	6.1E-11	bis(2-Ethylhexyl)phthalate	7.35E-05	2.5E-09	1.4E-02	3.4E-11	9.5E-11
Beryllium	1.42E-05	8.4E-10	4.3E+00	3.6E-09	Beryllium	1.42E-05	4.8E-10	4.3E+00	2.0E-09	5.7E-09
Lead	6.61E-04	3.9E-08			Lead	6.61E-04	2.2E-08			
Dibenzo(a,h)anthracene	2.40E-06	1.4E-10	7.3E+00	1.0E-09	Dibenzo(a,h)anthracene	2.39E-06	8.0E-11	7.3E+00	5.8E-10	1.6E-09
Indeno(1,2,3-cd)pyrene	5.40E-06	3.2E-10	7.3E-01	2.3E-10	Indeno(1,2,3-cd)pyrene	5.37E-06	1.8E-10	7.3E-01	1.3E-10	3.6E-10
Phenanthrene	1.25E-05	7.4E-10			Phenanthrene	1.22E-05	4.1E-10			
TH-TOTAL	1.90E-04	1.1E-08			TH-TOTAL	1.90E-04	6.4E-09			
U-TOTAL	1.66E-03	9.8E-08			U-TOTAL	1.66E-03	5.6E-08			
			Total Pathway:	1.6E-08				Total Pathway:	9.1E-09	

Total Rad + Chem 2.1E-08 | Total Rad + Chem 1.2E-08 | *Total:* 3.2E-08

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TABLE B.3.5-19
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	7.3E-06	7.7E-01			CS-137	7.26E-06	4.3E-01			
NP-237	5.8E-06	6.2E-01			NP-237	5.85E-06	3.5E-01			
PU-238	4.2E-06	4.5E-01			PU-238	4.23E-06	2.5E-01			
PU-239/240	1.0E-06	1.1E-01			PU-239/240	1.00E-06	6.0E-02			
RA-226	1.6E-05	1.7E+00			RA-226	1.64E-05	9.8E-01			
RA-228	1.2E-05	1.3E+00			RA-228	1.20E-05	7.2E-01			
SR-90	8.2E-06	8.7E-01			SR-90	8.22E-06	4.9E-01			
TH-228	2.1E-05	2.3E+00			TH-228	2.08E-05	1.2E+00			
TH-230	3.4E-04	3.6E+01			TH-230	3.37E-04	2.0E+01			
TH-232	9.8E-06	1.0E+00			TH-232	9.80E-06	5.9E-01			
U-234	1.6E-04	1.7E+01			U-234	1.63E-04	9.8E+00			
U-235/236	1.4E-05	1.4E+00			U-235/236	1.35E-05	8.1E-01			
U-238	5.5E-04	5.9E+01			U-238	5.54E-04	3.3E+01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.3E-07	2.0E-10			Aroclor-1254	4.33E-07	1.1E-10			
Arsenic	6.5E-05	3.0E-08	3.0E-04	1.0E-04	Arsenic	6.51E-05	1.7E-08	3.0E-04	5.6E-05	1.6E-04
Benzo(a)pyrene	8.4E-06	3.9E-09			Benzo(a)pyrene	8.36E-06	2.2E-09			
Benzo(a)anthracene	7.2E-06	3.3E-09			Benzo(a)anthracene	7.17E-06	1.9E-09			
Benzo(b)fluoranthene	7.6E-06	3.5E-09			Benzo(b)fluoranthene	7.53E-06	2.0E-09			
Benzo(g,h,i)perylene	4.7E-06	2.2E-09			Benzo(g,h,i)perylene	4.66E-06	1.2E-09			
bis(2-Ethylhexyl)phthalat	7.4E-05	3.4E-08	2.0E-02	1.7E-06	bis(2-Ethylhexyl)phthalat	7.35E-05	1.9E-08	2.0E-02	9.6E-07	2.6E-06
Beryllium	1.4E-05	6.6E-09	5.0E-03	1.3E-06	Beryllium	1.42E-05	3.7E-09	5.0E-03	7.4E-07	2.1E-06
Lead	6.6E-04	3.0E-07			Lead	6.61E-04	1.7E-07			
Dibenzo(a,h)anthracene	2.4E-06	1.1E-09			Dibenzo(a,h)anthracene	2.39E-06	6.2E-10			
Indeno(1,2,3-cd)pyrene	5.4E-06	2.5E-09			Indeno(1,2,3-cd)pyrene	5.37E-06	1.4E-09			
Phenanthrene	1.3E-05	5.8E-09			Phenanthrene	1.22E-05	3.2E-09			
TH-TOTAL	1.9E-04	8.7E-08			TH-TOTAL	1.90E-04	4.9E-08			
U-TOTAL	1.7E-03	7.6E-07	3.0E-03	2.5E-04	U-TOTAL	1.66E-03	4.3E-07	3.0E-03	1.4E-04	4.0E-04
			Total Pathway:	3.6E-04				Total Pathway:	2.0E-04	

Total Rad + Chem 3.6E-04

Total Rad + Chem 2.0E-04 *Total:* 5.6E-04

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TABLE B.3.5-19

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/g)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.54E-02	1.6E+03	1.3E-12	2.1E-09

Total Pathway: 2.1E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/g)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.54E-02	9.2E+02	1.3E-12	1.2E-09

Total Pathway: 1.2E-09

Total	Total Dust & Groundwater Affected
	3.4E-11
	2.1E-10
	1.5E-10
	3.8E-11
	2.1E-09
	2.0E-10
	4.9E-11
	1.9E-10
	7.3E-10
	2.8E-10
	4.3E-10
	3.6E-11
	2.6E-09
3.3E-09	3.3E-09

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

		Total	Total Dust & Groundwater Affected
			3.1E-10
			1.1E-08
			5.7E-09
			4.9E-10
			5.1E-10
			9.5E-11
			5.7E-09
			1.6E-09
			3.6E-10

Total Rad + Chem 2.1E-09

Total Rad + Chem 1.2E-09

Total:	3.3E-09	3.6E-08

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TABLE B.3.5-19
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/g)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.5E-02	1.6E+03		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/g)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.54E-02	9.2E+02		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
Arsenic		1.6E-04
bis(2-Ethylhexyl)phthalat		2.6E-06
Beryllium		2.1E-06
U-TOTAL		4.0E-04
Total:		5.6E-04

TABLE B.3.5-20
FUTURE, ON-PROPERTY FARMER (CT VALUES)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.39E-02	2.5E+00	2.8E-11	7.0E-11	CS-137	8.36E-03	2.8E+00	2.8E-11	7.8E-11	1.5E-10
NP-237	6.52E-05	6.9E-03	2.2E-10	1.5E-12	NP-237	5.93E-06	2.0E-03	2.2E-10	4.3E-13	1.9E-12
PU-238	2.81E-07	3.0E-05	2.2E-10	6.5E-15	PU-238	5.62E-08	1.9E-05	2.2E-10	4.1E-15	1.1E-14
PU-239/240	1.68E-07	1.8E-05	2.3E-10	4.1E-15	PU-239/240	3.37E-08	1.1E-05	2.3E-10	2.6E-15	6.7E-15
RA-226	1.42E-03	1.5E-01	7.8E-10	1.2E-10	RA-226	2.56E-03	8.5E-01	7.8E-10	6.6E-10	7.8E-10
RA-228	2.83E-04	3.0E-02	1.0E-10	3.0E-12	RA-228	5.09E-04	1.7E-01	1.0E-10	1.7E-11	2.0E-11
SR-90	1.02E-03	1.1E-01	3.6E-11	3.9E-12	SR-90	5.09E-03	1.7E+00	3.6E-11	6.1E-11	6.5E-11
TH-228	1.09E-05	1.1E-03	5.5E-11	6.3E-14	TH-228	9.04E-06	3.0E-03	5.5E-11	1.6E-13	2.3E-13
TH-230	8.87E-04	9.3E-02	1.3E-11	1.2E-12	TH-230	7.39E-04	2.5E-01	1.3E-11	3.2E-12	4.4E-12
TH-232	2.37E-05	2.5E-03	1.7E-10	4.2E-13	TH-232	1.98E-05	6.6E-03	1.7E-10	1.1E-12	1.5E-12
U-234	3.67E-03	3.9E-01	1.6E-11	6.2E-12	U-234	1.10E-02	3.7E+00	1.6E-11	5.8E-11	6.5E-11
U-235/236	3.04E-04	3.2E-02	1.6E-11	5.1E-13	U-235/236	9.12E-04	3.0E-01	1.6E-11	4.8E-12	5.4E-12
U-238	1.25E-02	1.3E+00	2.8E-11	3.7E-11	U-238	3.74E-02	1.2E+01	2.8E-11	3.5E-10	3.8E-10
		Total Pathway:		2.4E-10			Total Pathway:		1.2E-09	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	1.02E-06	6.0E-11	7.7E+00	4.6E-10	Aroclor-1254	3.2E-07	6.0E-11	7.7E+00	4.6E-10	9.2E-10
Arsenic	3.31E-05	2.0E-09	1.8E+00	3.4E-09	Arsenic	9.9E-07	1.8E-10	1.8E+00	3.2E-10	3.7E-09
Benzo(a)pyrene	2.45E-05	1.4E-09	7.3E+00	1.1E-08	Benzo(a)pyrene	7.8E-06	1.4E-09	7.3E+00	1.0E-08	2.1E-08
Benzo(a)anthracene	7.69E-06	4.5E-10	7.3E-01	3.3E-10	Benzo(a)anthracene	2.4E-06	4.5E-10	7.3E-01	3.3E-10	6.6E-10
Benzo(b)fluoranthene	2.29E-05	1.3E-09	7.3E-01	9.8E-10	Benzo(b)fluoranthene	7.2E-06	1.3E-09	7.3E-01	9.8E-10	2.0E-09
Benzo(g,h,i)perylene	1.82E-04	1.1E-08			Benzo(g,h,i)perylene	5.7E-05	1.1E-08			
bis(2-Ethylhexyl)phthalate	1.13E-03	6.6E-08	1.4E-02	9.3E-10	bis(2-Ethylhexyl)phthalate	3.6E-04	6.6E-08	1.4E-02	9.2E-10	1.9E-09
Beryllium	5.77E-06	3.4E-10	4.3E+00	1.5E-09	Beryllium	5.2E-09	9.6E-13	4.3E+00	4.1E-12	1.5E-09
Lead	1.04E-04	6.1E-09			Lead	8.6E-05	1.6E-08			
Dibenzo(a,h)anthracene	3.89E-05	2.3E-09	7.3E+00	1.7E-08	Dibenzo(a,h)anthracene	1.2E-05	2.3E-09	7.3E+00	1.7E-08	3.3E-08
Indeno(1,2,3-cd)pyrene	4.73E-05	2.8E-09	7.3E-01	2.0E-09	Indeno(1,2,3-cd)pyrene	1.5E-05	2.8E-09	7.3E-01	2.0E-09	4.1E-09
Phenanthrene	1.01E-06	5.9E-11			Phenanthrene	3.2E-07	5.9E-11			
TH-TOTAL	5.02E-07	3.0E-11			TH-TOTAL	4.2E-07	7.8E-11			
U-TOTAL	3.74E-05	2.2E-09			U-TOTAL	1.1E-04	2.1E-08			
		Total Pathway:		3.7E-08			Total Pathway:		3.2E-08	
		Total Rad + Chem		3.7E-08			Total Rad + Chem		3.3E-08	*Total:* 7.0E-08

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TABLE B.3.5-20
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.4E-02	2.5E+00			CS-137	8.36E-03	2.8E+00			
NP-237	6.5E-05	6.9E-03			NP-237	5.93E-06	2.0E-03			
PU-238	2.8E-07	3.0E-05			PU-238	5.62E-08	1.9E-05			
PU-239/240	1.7E-07	1.8E-05			PU-239/240	3.37E-08	1.1E-05			
RA-226	1.4E-03	1.5E-01			RA-226	2.56E-03	8.5E-01			
RA-228	2.8E-04	3.0E-02			RA-228	5.09E-04	1.7E-01			
SR-90	1.0E-03	1.1E-01			SR-90	5.09E-03	1.7E+00			
TH-228	1.1E-05	1.1E-03			TH-228	9.04E-06	3.0E-03			
TH-230	8.9E-04	9.3E-02			TH-230	7.39E-04	2.5E-01			
TH-232	2.4E-05	2.5E-03			TH-232	1.98E-05	6.6E-03			
U-234	3.7E-03	3.9E-01			U-234	1.10E-02	3.7E+00			
U-235/236	3.0E-04	3.2E-02			U-235/236	9.12E-04	3.0E-01			
U-238	1.2E-02	1.3E+00			U-238	3.74E-02	1.2E+01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.02E-06	4.7E-10			Aroclor-1254	3.2E-07	4.7E-10			
Arsenic	3.31E-05	1.5E-08	3.0E-04	5.1E-05	Arsenic	9.9E-07	1.4E-09	3.0E-04	4.8E-06	5.5E-05
Benzo(a)pyrene	2.45E-05	1.1E-08			Benzo(a)pyrene	7.8E-06	1.1E-08			
Benzo(a)anthracene	7.69E-06	3.5E-09			Benzo(a)anthracene	2.4E-06	3.5E-09			
Benzo(b)fluoranthene	2.29E-05	1.0E-08			Benzo(b)fluoranthene	7.2E-06	1.0E-08			
Benzo(g,h,i)perylene	1.82E-04	8.3E-08			Benzo(g,h,i)perylene	5.7E-05	8.3E-08			
bis(2-Ethylhexyl)phthalate	1.13E-03	5.2E-07	2.0E-02	2.6E-05	bis(2-Ethylhexyl)phthalate	3.6E-04	5.1E-07	2.0E-02	2.6E-05	5.1E-05
Beryllium	5.77E-06	2.6E-09	5.0E-03	5.3E-07	Beryllium	5.2E-09	7.5E-12	5.0E-03	1.5E-09	5.3E-07
Lead	1.04E-04	4.7E-08			Lead	8.6E-05	1.2E-07			
Dibenzo(a,h)anthracene	3.89E-05	1.8E-08			Dibenzo(a,h)anthracene	1.2E-05	1.8E-08			
Indeno(1,2,3-cd)pyrene	4.73E-05	2.2E-08			Indeno(1,2,3-cd)pyrene	1.5E-05	2.2E-08			
Phenanthrene	1.01E-06	4.6E-10			Phenanthrene	3.2E-07	4.6E-10			
TH-TOTAL	5.02E-07	2.3E-10			TH-TOTAL	4.2E-07	6.0E-10			
U-TOTAL	3.74E-05	1.7E-08	3.0E-03	5.7E-06	U-TOTAL	1.1E-04	1.6E-07	3.0E-03	5.4E-05	6.0E-05
			Total Pathway:	8.3E-05				Total Pathway:	8.4E-05	

Total Rad + Chem 8.3E-05 | Total Rad + Chem 8.4E-05 | *Total:* 1.7E-04

TABLE B.3.5-20
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)

Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.03E+01	1.1E+03	1.3E-12	1.4E-09

Total Pathway: 1.4E-09

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.25E+01	4.1E+03	1.3E-12	5.4E-09

Total Pathway: 5.4E-09

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.4E-09

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 5.4E-09

	Total	Total Dust & Groundwater Affected
CS-137		1.5E-10
NP-237		1.9E-12
PU-238		1.1E-14
PU-239/240		6.7E-15
RA-226		7.8E-10
RA-228		2.0E-11
SR-90		6.5E-11
TH-228		2.3E-13
TH-230		4.4E-12
TH-232		1.5E-12
U-234		6.5E-11
U-235/236		5.4E-12
U-238		3.8E-10
TC-99	6.8E-09	6.8E-09
Aroclor-1254		9.2E-10
Arsenic		3.7E-09
Benzo(a)pyrene		2.1E-08
Benzo(a)anthracene		6.6E-10
Benzo(b)fluoranthene		2.0E-09
Benzo(g,h,i)perylene		
bis(2-Ethylhexyl)phthalate		1.9E-09
Beryllium		1.5E-09
Lead		
Dibenzo(a,h)anthracene		3.3E-08
Indeno(1,2,3-cd)pyrene		4.1E-09
Phenanthrene		
TH-TOTAL		
U-TOTAL		
Total:	6.8E-09	7.7E-08

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TABLE B.3.5-20
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.0E+01	1.1E+03		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.25E+01	4.1E+03		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Total Rad + Chem

Total	Total Dust & Groundwater Affected
	5.5E-05
	5.1E-05
	5.3E-07
	6.0E-05

Total: 1.7E-04

TABLE B.3.5-21
FUTURE, ON-PROPERTY FARMER (CT VALUES)
LIME SLUDGE PONDS: GROUNDWATER

Carcinogenic Risk

Radiation Risk									
Ingestion/Groundwater					Inhalation/Groundwater		Dermal Contact/Groundwater		Total
Compoun	Conc'n (pCi/L)	Intake	SF(o)	Risk					
TC-99	3.0E+00	8.7E+03	1.3E-12	1.1E-08	Not applicable		Not applicable		1.1E-08
			Total Pathway:	1.1E-08	Total Pathway:	0.0E+00	Total Pathway:	0.0E+00	
			Total Rad + Chem	1.1E-08	Total Rad + Chem	0.0E+00	Total Rad + Chem	0.0E+00	*Total:* 1.1E-08

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TABLE B.3.5-22(a)

FUTURE ON-PROPERTY [SOLID WASTE LANDFILL] PERCHED GROUNDWATER USER(RME VALUES)

LIME SLUDGE PONDS: SURFACE SOIL

CARCINOGENIC RISK

Radiation Risk

Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	1.05E-05	1.2E+00	1.9E-11	2.3E-11	2.3E-11
NP-237	1.08E-05	1.3E+00	2.9E-08	3.6E-08	3.6E-08
PU-238	8.64E-06	1.0E+00	3.9E-08	3.9E-08	3.9E-08
PU-239/240	2.03E-06	2.4E-01	3.8E-08	8.9E-09	8.9E-09
RA-226	2.88E-05	3.3E+00	7.0E-09	2.3E-08	2.3E-08
RA-228	2.46E-05	2.9E+00	6.9E-10	2.0E-09	2.0E-09
SR-90	1.18E-05	1.4E+00	6.2E-11	8.5E-11	8.5E-11
TH-228	4.37E-05	5.1E+00	7.8E-08	4.0E-07	4.0E-07
TH-230	6.72E-04	7.8E+01	2.9E-08	2.3E-06	2.3E-06
TH-232	1.96E-05	2.3E+00	1.1E-07	2.5E-07	2.5E-07
U-234	3.15E-04	3.7E+01	2.6E-08	9.5E-07	9.5E-07
U-235/236	2.61E-05	3.0E+00	2.5E-08	7.6E-08	7.6E-08
U-238	1.07E-03	1.2E+02	5.2E-08	6.4E-06	6.4E-06

Total Pathway: 1.0E-05

Chemical Risk

Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	8.85E-10	5.7E-11			
Arsenic	1.08E-07	7.0E-09	1.5E+01	1.0E-07	1.0E-07
Benzo(a)pyrene	1.65E-08	1.1E-09	6.1E+00	6.5E-09	6.5E-09
Benzo(a)anthracene	1.37E-08	8.9E-10	6.1E-01	5.4E-10	5.4E-10
Benzo(b)fluoranthene	1.50E-08	9.7E-10	6.1E-01	5.9E-10	5.9E-10
Benzo(g,h,i)perylene	9.51E-09	6.2E-10			
bis(2-Ethylhexyl)phthalate	1.50E-07	9.7E-09			
Beryllium	2.28E-08	1.5E-09	8.4E+00	1.2E-08	1.2E-08
Lead	4.13E-07	2.7E-08			
Dibenzo(a,h)anthracene	4.80E-09	3.1E-10	6.1E+00	1.9E-09	1.9E-09
Indeno(1,2,3-cd)pyrene	1.08E-08	7.0E-10	6.1E-01	4.3E-10	4.3E-10
Phenanthrene	2.42E-08	1.6E-09			
TH-TOTAL	3.79E-07	2.5E-08			
U-TOTAL	3.21E-06	2.1E-07			

Total Pathway: 1.3E-07

Total Rad + Chem 1.1E-05 *Total:* 1.1E-05

TABLE B.3.5-22(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.05E-05	1.2E+00		
NP-237	1.08E-05	1.3E+00		
PU-238	8.64E-06	1.0E+00		
PU-239/240	2.03E-06	2.4E-01		
RA-226	2.88E-05	3.3E+00		
RA-228	2.46E-05	2.9E+00		
SR-90	1.18E-05	1.4E+00		
TH-228	4.37E-05	5.1E+00		
TH-230	6.72E-04	7.8E+01		
TH-232	1.96E-05	2.3E+00		
U-234	3.15E-04	3.7E+01		
U-235/236	2.61E-05	3.0E+00		
U-238	1.07E-03	1.2E+02		
		Total Pathway:		

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	8.85E-10	5.7E-11		
Arsenic	1.08E-07	7.0E-09		
Benzo(a)pyrene	1.65E-08	1.1E-09		
Benzo(a)anthracene	1.37E-08	8.9E-10		
Benzo(b)fluoranthene	1.50E-08	9.7E-10		
Benzo(g,h,i)perylene	9.51E-09	6.2E-10		
bis(2-Ethylhexyl)phthalate	1.50E-07	9.7E-09		
Beryllium	2.28E-08	1.5E-09		
Lead	4.13E-07	2.7E-08		
Dibenzo(a,h)anthracene	4.80E-09	3.1E-10		
Indeno(1,2,3-cd)pyrene	1.08E-08	7.0E-10		
Phenanthrene	2.42E-08	1.6E-09		
TH-TOTAL	3.79E-07	2.5E-08		
U-TOTAL	3.21E-06	2.1E-07		
		Total Pathway:		

Total Rad + Chem

Total

Total:

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TABLE B.3.5-22(b)
FUTURE, ON-PROPERTY [SOLID WASTE LANDFILL] PERCHED GROUNDWATER USER (RME VALUES)
LIME SLUDGE PONDS: PERCHED GROUNDWATER
Carcinogenic Risk

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater	Dermal Contact/Groundwater	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk			
NP-237	5.1E+00	2.5E+05	2.2E-10	5.5E-05	Not applicable	Not applicable	5.5E-05
SR-90	1.9E+00	9.4E+04	3.6E-11	3.4E-06			3.4E-06
TC-99	8.2E+01	4.0E+06	1.3E-12	5.2E-06			5.2E-06
			Total Pathway:	6.3E-05	Total Pathway: 0.0E+00	Total Pathway: 0.0E+00	

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater				Dermal Contact/Groundwater				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk	Compound	Intake	SF(derm)	Risk	
Arsenic	1.45E-05	4.0E-07	1.8E+00	7.0E-07	Arsenic	1.5E-06			Arsenic	1.1E-09	1.8E+00	2.1E-09	7.0E-07
1,1,2-Trichlorotrifluoroethane	1.66E-04	4.5E-06			1,1,2-Trichlorotrifluoroethane	1.7E-05			1,1,2-Trichlorotrifluoroethane	6.2E-08			
1,2-Diethylbenzene	1.00E-07				1,2-Diethylbenzene	1.0E-08			1,2-Diethylbenzene	7.9E-12			
			Total Pathway:	7.0E-07		Total Pathway: 0.0E+00					Total Pathway:	2.1E-09	
			Total Rad + Chem	6.4E-05		Total Rad + Chem 0.0E+00					Total Rad + Chem	2.1E-09	Total: 6.4E-05

TABLE B.3.5-22(b)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	5.1	2.5E+05		
SR-90	1.9	9.4E+04		
TC-99	82.3	4.0E+06		
		Total Pathway:		0.0E+00

Inhalation/Groundwater	
Not applicable	
Total Pathway:	0.0E+00

Dermal Contact/Groundwater	
Not applicable	
Total Pathway:	0.0E+00

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.45E-05	4.0E-07	3.0E-04	1.3E-03
1,1,2-Trichlorotrifluoroethane	1.66E-04	4.5E-06		
1,2-Diethylbenzene	1.00E-07	2.7E-09		
		Total Pathway:		1.3E-03
		Total Rad + Chem		1.3E-03

Inhalation/Groundwater			
Compound	Intake	RfD(i	Hazard
Arsenic	1.5E-06		
1,1,2-Trichlorotrifluoroethane	1.7E-05		
1,2-Diethylbenzene	1.0E-08		
	Total Pathway:		0.0E+00
	Total Rad + Chem		0.0E+00

Dermal Contact/Groundwater				
Compound	Intake	RfD(derm	Hazard	
Arsenic	1.1E-09	2.9E-04	4.0E-06	1.3E-03
1,1,2-Trichlorotrifluoroethane	6.2E-08			
1,2-Diethylbenzene	7.9E-12			
		Total Pathway:	4.0E-06	
		Total Rad + Chem	4.0E-06	*Total:* 1.3E-03

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TABLE B.3.5-22(c)
FUTURE, ON-PROPERTY [SOLID WASTE LANDFILL]PERCHED GROUNDWATER USER (RME VALUES)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	2.39E-02	4.4E+01	2.8E-11	1.2E-09	CS-137	8.36E-03	6.1E+01	2.8E-11	1.7E-09	2.9E-09
NP-237	6.52E-05	1.2E-01	2.2E-10	2.6E-11	NP-237	5.93E-06	4.4E-02	2.2E-10	9.6E-12	3.6E-11
PU-238	2.81E-07	5.2E-04	2.2E-10	1.1E-13	PU-238	5.62E-08	4.1E-04	2.2E-10	9.1E-14	2.0E-13
PU-239/240	1.68E-07	3.1E-04	2.3E-10	7.1E-14	PU-239/240	3.37E-08	2.5E-04	2.3E-10	5.7E-14	1.3E-13
RA-226	1.42E-03	2.6E+00	7.8E-10	2.0E-09	RA-226	2.56E-03	1.9E+01	7.8E-10	1.5E-08	1.7E-08
RA-228	2.83E-04	5.2E-01	1.0E-10	5.2E-11	RA-228	5.09E-04	3.7E+00	1.0E-10	3.7E-10	4.3E-10
SR-90	1.02E-03	1.9E+00	3.6E-11	6.7E-11	SR-90	5.09E-03	3.7E+01	3.6E-11	1.3E-09	1.4E-09
TH-228	1.09E-05	2.0E-02	5.5E-11	1.1E-12	TH-228	9.04E-06	6.6E-02	5.5E-11	3.7E-12	4.8E-12
TH-230	8.87E-04	1.6E+00	1.3E-11	2.1E-11	TH-230	7.39E-04	5.4E+00	1.3E-11	7.1E-11	9.2E-11
TH-232	2.37E-05	4.4E-02	1.7E-10	7.4E-12	TH-232	1.98E-05	1.5E-01	1.7E-10	2.5E-11	3.2E-11
U-234	3.67E-03	6.7E+00	1.6E-11	1.1E-10	U-234	1.10E-02	8.1E+01	1.6E-11	1.3E-09	1.4E-09
U-235/236	3.04E-04	5.6E-01	1.6E-11	8.9E-12	U-235/236	9.12E-04	6.7E+00	1.6E-11	1.1E-10	1.2E-10
U-238	1.25E-02	2.3E+01	2.8E-11	6.4E-10	U-238	3.74E-02	2.7E+02	2.8E-11	7.7E-09	8.3E-09
			Total Pathway:	4.2E-09				Total Pathway:	2.7E-08	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	1.0E-06	1.0E-09	7.7E+00	8.1E-09	Aroclor-1254	3.2E-07	1.3E-09	7.7E+00	1.0E-08	1.8E-08
Arsenic	3.3E-05	3.4E-08	1.8E+00	6.0E-08	Arsenic	9.9E-07	4.1E-09	1.8E+00	7.1E-09	6.7E-08
Benzo(a)pyrene	2.5E-05	2.5E-08	7.3E+00	1.8E-07	Benzo(a)pyrene	7.8E-06	3.2E-08	7.3E+00	2.3E-07	4.2E-07
Benzo(a)anthracene	7.7E-06	7.9E-09	7.3E-01	5.8E-09	Benzo(a)anthracene	2.4E-06	1.0E-08	7.3E-01	7.3E-09	1.3E-08
Benzo(b)fluoranthene	2.3E-05	2.4E-08	7.3E-01	1.7E-08	Benzo(b)fluoranthene	7.2E-06	3.0E-08	7.3E-01	2.2E-08	3.9E-08
Benzo(g,h,i)perylene	1.8E-04	1.9E-07			Benzo(g,h,i)perylene	5.7E-05	2.4E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.2E-06	1.4E-02	1.6E-08	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-06	1.4E-02	2.0E-08	3.7E-08
Beryllium	5.8E-06	5.9E-09	4.3E+00	2.6E-08	Beryllium	5.2E-09	2.1E-11	4.3E+00	9.2E-11	2.6E-08
Lead	1.0E-04	1.1E-07			Lead	8.6E-05	3.5E-07			
Dibenzo(a,h)anthracene	3.9E-05	4.0E-08	7.3E+00	2.9E-07	Dibenzo(a,h)anthracene	1.2E-05	5.0E-08	7.3E+00	3.7E-07	6.6E-07
Indeno(1,2,3-cd)pyrene	4.7E-05	4.9E-08	7.3E-01	3.5E-08	Indeno(1,2,3-cd)pyrene	1.5E-05	6.1E-08	7.3E-01	4.5E-08	8.0E-08
Phenanthrene	1.0E-06	1.0E-09			Phenanthrene	3.2E-07	1.3E-09			
TH-TOTAL	5.0E-07	5.2E-10			TH-TOTAL	4.2E-07	1.7E-09			
U-TOTAL	3.7E-05	3.8E-08			U-TOTAL	1.1E-04	4.6E-07			
			Total Pathway:	6.4E-07				Total Pathway:	7.1E-07	
			Total Rad + Chem	6.5E-07				Total Rad + Chem	7.4E-07	*Total:* 1.4E-06

TABLE B.3.5-22(c)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	2.4E-02	4.4E+01			CS-137	8.36E-03	6.1E+01			
NP-237	6.5E-05	1.2E-01			NP-237	5.93E-06	4.4E-02			
PU-238	2.8E-07	5.2E-04			PU-238	5.62E-08	4.1E-04			
PU-239/240	1.7E-07	3.1E-04			PU-239/240	3.37E-08	2.5E-04			
RA-226	1.4E-03	2.6E+00			RA-226	2.56E-03	1.9E+01			
RA-228	2.8E-04	5.2E-01			RA-228	5.09E-04	3.7E+00			
SR-90	1.0E-03	1.9E+00			SR-90	5.09E-03	3.7E+01			
TH-228	1.1E-05	2.0E-02			TH-228	9.04E-06	6.6E-02			
TH-230	8.9E-04	1.6E+00			TH-230	7.39E-04	5.4E+00			
TH-232	2.4E-05	4.4E-02			TH-232	1.98E-05	1.5E-01			
U-234	3.7E-03	6.7E+00			U-234	1.10E-02	8.1E+01			
U-235/236	3.0E-04	5.6E-01			U-235/236	9.12E-04	6.7E+00			
U-238	1.2E-02	2.3E+01			U-238	3.74E-02	2.7E+02			
Total Pathway:					Total Pathway:					

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	1.0E-06	1.0E-09			Aroclor-1254	3.2E-07	1.3E-09			
Arsenic	3.3E-05	3.4E-08	3.0E-04	1.1E-04	Arsenic	9.9E-07	4.1E-09	3.0E-04	1.4E-05	1.3E-04
Benzo(a)pyrene	2.5E-05	2.5E-08			Benzo(a)pyrene	7.8E-06	3.2E-08			
Benzo(a)anthracene	7.7E-06	7.9E-09			Benzo(a)anthracene	2.4E-06	1.0E-08			
Benzo(b)fluoranthene	2.3E-05	2.4E-08			Benzo(b)fluoranthene	7.2E-06	3.0E-08			
Benzo(g,h,i)perylene	1.8E-04	1.9E-07			Benzo(g,h,i)perylene	5.7E-05	2.4E-07			
bis(2-Ethylhexyl)phthalate	1.1E-03	1.2E-06	2.0E-02	5.8E-05	bis(2-Ethylhexyl)phthalate	3.6E-04	1.5E-06	2.0E-02	7.3E-05	1.3E-04
Beryllium	5.8E-06	5.9E-09	5.0E-03	1.2E-06	Beryllium	5.2E-09	2.1E-11	5.0E-03	4.3E-09	1.2E-06
Lead	1.0E-04	1.1E-07			Lead	8.6E-05	3.5E-07			
Dibenzo(a,h)anthracene	3.9E-05	4.0E-08			Dibenzo(a,h)anthracene	1.2E-05	5.0E-08			
Indeno(1,2,3-cd)pyrene	4.7E-05	4.9E-08			Indeno(1,2,3-cd)pyrene	1.5E-05	6.1E-08			
Phenanthrene	1.0E-06	1.0E-09			Phenanthrene	3.2E-07	1.3E-09			
TH-TOTAL	5.0E-07	5.2E-10			TH-TOTAL	4.2E-07	1.7E-09			
U-TOTAL	3.7E-05	3.8E-08	3.0E-03	1.3E-05	U-TOTAL	1.1E-04	4.6E-07	3.0E-03	1.5E-04	1.7E-04
Total Pathway:				1.9E-04	Total Pathway:				2.4E-04	
Total Rad + Chem				1.9E-04	Total Rad + Chem				2.4E-04	*Total:* 4.3E-04

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TABLE B.3.5-22(c)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.03E+01	1.9E+04	1.3E-12	2.5E-08

Total Pathway: 2.5E-08

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.25E+01	9.2E+04	1.3E-12	1.2E-07

Total Pathway: 1.2E-07

Total	Total Dust & Groundwater Affected
	2.9E-09
	3.6E-11
	2.0E-13
	1.3E-13
	1.7E-08
	4.3E-10
	1.4E-09
	4.8E-12
	9.2E-11
	3.2E-11
	1.4E-09
	1.2E-10
	8.3E-09
1.4E-07	1.4E-07

Chemical Risk

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 2.5E-08

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				

Total Pathway:

Total Rad + Chem 1.2E-07

Total	Total Dust & Groundwater Affected
	1.8E-08
	6.7E-08
	4.2E-07
	1.3E-08
	3.9E-08
	3.7E-08
	2.6E-08
	6.6E-07
	8.0E-08
Total: 1.4E-07	1.5E-06

TABLE B.3.5-22(c)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (GROUNDWATER AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef

Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.0E+01	1.9E+04		

Total Pathway:

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.25E+01	9.2E+04		

Total Pathway:

Chemical Hazard

Ingestion of Beef

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Total	Total Dust & Groundwater Affected
	1.3E-04
	1.3E-04
	1.2E-06
	1.7E-04
Total:	4.3E-04

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TABLE B.3.5-22(d)

FUTURE ON-PROPERTY [SOLID WASTE LANDFILL] PERCHED GROUNDWATER USER (RME VALUES)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	7.27E-06	1.4E+01	2.8E-11	4.0E-10	CS-137	7.26E-06	7.6E+00	2.8E-11	2.1E-10	6.1E-10
NP-237	5.85E-06	1.2E+01	2.2E-10	2.5E-09	NP-237	5.85E-06	6.1E+00	2.2E-10	1.3E-09	3.9E-09
PU-238	4.23E-06	8.3E+00	2.2E-10	1.8E-09	PU-238	4.23E-06	4.4E+00	2.2E-10	9.7E-10	2.8E-09
PU-239/240	1.00E-06	2.0E+00	2.3E-10	4.5E-10	PU-239/240	1.00E-06	1.0E+00	2.3E-10	2.4E-10	6.9E-10
RA-226	1.64E-05	3.2E+01	7.8E-10	2.5E-08	RA-226	1.64E-05	1.7E+01	7.8E-10	1.3E-08	3.8E-08
RA-228	1.21E-05	2.4E+01	1.0E-10	2.4E-09	RA-228	1.20E-05	1.2E+01	1.0E-10	1.2E-09	3.6E-09
SR-90	8.24E-06	1.6E+01	3.6E-11	5.8E-10	SR-90	8.22E-06	8.6E+00	3.6E-11	3.1E-10	8.9E-10
TH-228	2.14E-05	4.2E+01	5.5E-11	2.3E-09	TH-228	2.08E-05	2.2E+01	5.5E-11	1.2E-09	3.5E-09
TH-230	3.37E-04	6.6E+02	1.3E-11	8.6E-09	TH-230	3.37E-04	3.5E+02	1.3E-11	4.6E-09	1.3E-08
TH-232	9.80E-06	1.9E+01	1.7E-10	3.3E-09	TH-232	9.80E-06	1.0E+01	1.7E-10	1.7E-09	5.0E-09
U-234	1.63E-04	3.2E+02	1.6E-11	5.1E-09	U-234	1.63E-04	1.7E+02	1.6E-11	2.7E-09	7.9E-09
U-235/236	1.35E-05	2.7E+01	1.6E-11	4.3E-10	U-235/236	1.35E-05	1.4E+01	1.6E-11	2.3E-10	6.5E-10
U-238	5.54E-04	1.1E+03	2.8E-11	3.1E-08	U-238	5.54E-04	5.8E+02	2.8E-11	1.6E-08	4.7E-08
			Total Pathway:	8.4E-08				Total Pathway:	4.4E-08	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.33E-07	4.8E-10	7.7E+00	3.7E-09	Aroclor-1254	4.33E-07	2.5E-10	7.7E+00	1.9E-09	5.6E-09
Arsenic	6.51E-05	7.2E-08	1.8E+00	1.3E-07	Arsenic	6.51E-05	3.8E-08	1.8E+00	6.6E-08	1.9E-07
Benzo(a)pyrene	8.42E-06	9.3E-09	7.3E+00	6.8E-08	Benzo(a)pyrene	8.36E-06	4.9E-09	7.3E+00	3.6E-08	1.0E-07
Benzo(a)anthracene	7.22E-06	8.0E-09	7.3E-01	5.8E-09	Benzo(a)anthracene	7.17E-06	4.2E-09	7.3E-01	3.1E-09	8.9E-09
Benzo(b)fluoranthene	7.60E-06	8.4E-09	7.3E-01	6.1E-09	Benzo(b)fluoranthene	7.53E-06	4.4E-09	7.3E-01	3.2E-09	9.3E-09
Benzo(g,h,i)perylene	4.69E-06	5.2E-09			Benzo(g,h,i)perylene	4.66E-06	2.7E-09			
bis(2-Ethylhexyl)phthalate	7.35E-05	8.1E-08	1.4E-02	1.1E-09	bis(2-Ethylhexyl)phthalate	7.35E-05	4.3E-08	1.4E-02	6.0E-10	1.7E-09
Beryllium	1.42E-05	1.6E-08	4.3E+00	6.7E-08	Beryllium	1.42E-05	8.3E-09	4.3E+00	3.6E-08	1.0E-07
Lead	6.61E-04	7.3E-07			Lead	6.61E-04	3.9E-07			
Dibenzo(a,h)anthracene	2.40E-06	2.6E-09	7.3E+00	1.9E-08	Dibenzo(a,h)anthracene	2.39E-06	1.4E-09	7.3E+00	1.0E-08	2.9E-08
Indeno(1,2,3-cd)pyrene	5.40E-06	6.0E-09	7.3E-01	4.3E-09	Indeno(1,2,3-cd)pyrene	5.37E-06	3.1E-09	7.3E-01	2.3E-09	6.6E-09
Phenanthrene	1.25E-05	1.4E-08			Phenanthrene	1.22E-05	7.1E-09			
TH-TOTAL	1.90E-04	2.1E-07			TH-TOTAL	1.90E-04	1.1E-07			
U-TOTAL	1.66E-03	1.8E-06			U-TOTAL	1.66E-03	9.7E-07			
			Total Pathway:	3.0E-07				Total Pathway:	1.6E-07	

Total Rad + Chem 3.8E-07

Total Rad + Chem 2.0E-07 *Total:* 5.9E-07

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TABLE B.3.5-22(d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	7.3E-06	1.4E+01			CS-137	7.26E-06	7.6E+00			
NP-237	5.8E-06	1.2E+01			NP-237	5.85E-06	6.1E+00			
PU-238	4.2E-06	8.3E+00			PU-238	4.23E-06	4.4E+00			
PU-239/240	1.0E-06	2.0E+00			PU-239/240	1.00E-06	1.0E+00			
RA-226	1.6E-05	3.2E+01			RA-226	1.64E-05	1.7E+01			
RA-228	1.2E-05	2.4E+01			RA-228	1.20E-05	1.2E+01			
SR-90	8.2E-06	1.6E+01			SR-90	8.22E-06	8.6E+00			
TH-228	2.1E-05	4.2E+01			TH-228	2.08E-05	2.2E+01			
TH-230	3.4E-04	6.6E+02			TH-230	3.37E-04	3.5E+02			
TH-232	9.8E-06	1.9E+01			TH-232	9.80E-06	1.0E+01			
U-234	1.6E-04	3.2E+02			U-234	1.63E-04	1.7E+02			
U-235/236	1.4E-05	2.7E+01			U-235/236	1.35E-05	1.4E+01			
U-238	5.5E-04	1.1E+03			U-238	5.54E-04	5.8E+02			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	4.3E-07	4.8E-10			Aroclor-1254	4.33E-07	2.5E-10			
Arsenic	6.5E-05	7.2E-08	3.0E-04	2.4E-04	Arsenic	6.51E-05	3.8E-08	3.0E-04	1.3E-04	3.7E-04
Benzo(a)pyrene	8.4E-06	9.3E-09			Benzo(a)pyrene	8.36E-06	4.9E-09			
Benzo(a)anthracene	7.2E-06	8.0E-09			Benzo(a)anthracene	7.17E-06	4.2E-09			
Benzo(b)fluoranthene	7.6E-06	8.4E-09			Benzo(b)fluoranthene	7.53E-06	4.4E-09			
Benzo(g,h,i)perylene	4.7E-06	5.2E-09			Benzo(g,h,i)perylene	4.66E-06	2.7E-09			
bis(2-Ethylhexyl)phthalat	7.4E-05	8.1E-08	2.0E-02	4.0E-06	bis(2-Ethylhexyl)phthalat	7.35E-05	4.3E-08	2.0E-02	2.1E-06	6.2E-06
Beryllium	1.4E-05	1.6E-08	5.0E-03	3.1E-06	Beryllium	1.42E-05	8.3E-09	5.0E-03	1.7E-06	4.8E-06
Lead	6.6E-04	7.3E-07			Lead	6.61E-04	3.9E-07			
Dibenzo(a,h)anthracene	2.4E-06	2.6E-09			Dibenzo(a,h)anthracene	2.39E-06	1.4E-09			
Indeno(1,2,3-cd)pyrene	5.4E-06	6.0E-09			Indeno(1,2,3-cd)pyrene	5.37E-06	3.1E-09			
Phenanthrene	1.3E-05	1.4E-08			Phenanthrene	1.22E-05	7.1E-09			
TH-TOTAL	1.9E-04	2.1E-07			TH-TOTAL	1.90E-04	1.1E-07			
U-TOTAL	1.7E-03	1.8E-06	3.0E-03	6.1E-04	U-TOTAL	1.66E-03	9.7E-07	3.0E-03	3.2E-04	9.3E-04
			Total Pathway:	8.6E-04				Total Pathway:	4.5E-04	

Total Rad + Chem 8.6E-04 | Total Rad + Chem 4.5E-04 | *Total:* 1.3E-03

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TABLE B.3.5-22(d)

(continued)

LIME SLUDGE PONDS: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.54E-02	3.0E+04	1.3E-12	4.0E-08
			Total Pathway:	4.0E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90			3.6E-11	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234			1.6E-11	
U-235/236			1.6E-11	
U-238			2.8E-11	
TC-99	1.54E-02	1.6E+04	1.3E-12	2.1E-08
			Total Pathway:	2.1E-08

Total	Total Dust & Groundwater Affected
	6.1E-10
	3.9E-09
	2.8E-09
	6.9E-10
	3.8E-08
	3.6E-09
	8.9E-10
	3.5E-09
	1.3E-08
	5.0E-09
	7.9E-09
	6.5E-10
	4.7E-08
6.1E-08	6.1E-08

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)pyrene			7.3E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate			1.4E-02	
Beryllium			4.3E+00	
Lead				
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-TOTAL				
U-TOTAL				
			Total Pathway:	

			5.6E-09
			1.9E-07
			1.0E-07
			8.9E-09
			9.3E-09
			1.7E-09
			1.0E-07
			2.9E-08
			6.6E-09

Total Rad + Chem 4.0E-08

Total Rad + Chem 2.1E-08 | *Total:* 6.1E-08 | 6.5E-07

TABLE B.3.5-22(d)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.5E-02	3.0E+04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90				
TH-228				
TH-230				
TH-232				
U-234				
U-235/236				
U-238				
TC-99	1.54E-02	1.6E+04		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Arsenic			3.0E-04	
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalat			2.0E-02	
Beryllium			5.0E-03	
Lead				
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL				
U-TOTAL			3.0E-03	

Total Pathway:

Total Rad + Chem

Total Rad + Chem

	Total	Total Dust & Groundwater Affected
		3.7E-04
		6.2E-06
		4.8E-06
		9.3E-04
Total:		1.3E-03

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TABLE B3.6-0a
OU2-WIDE (Farmers)
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	Conc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.499		2.8E-11	1.9E-11	2.0E-06				
NP-237	0.214		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.116		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.076		2.3E-10	3.8E-08	2.7E-11				
RA-226	30.800		7.8E-10	7.0E-09	6.0E-06				
RA-228	3.880		1.0E-10	6.9E-10	2.9E-06				
SR-90	1.600		3.6E-11	6.2E-11	0.0E+00				
TC-99	142.000		1.3E-12	8.3E-12	6.0E-13				
TH-228	4.410		5.5E-11	7.8E-08	5.6E-06				
TH-230	13.800		1.3E-11	2.9E-08	5.4E-11				
TH-232	3.990		1.7E-10	1.1E-07	8.5E-06				
U-234	8.656		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.887		1.6E-11	2.5E-08	2.4E-07				
U-238	9.311		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0.089	6.00E-02	7.70E+00			1.03E+01			
Aroclor-1260	0.052	6.00E-02	7.70E+00			1.03E+01			
Arsenic	7.268	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	5.500		7.30E-01	6.10E-01					
Benzo(a)pyrene	9.400		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	6.200		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	6.200	3.00E-01							
Benzo(k)fluoranthene	7.300		7.30E-02	6.10E-02					
Beryllium	0.942	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	24.580	1.00E-02							
Dibenzo(a,h)anthracen	1.900		7.30E+00	6.10E+00					
Dieldrin	0.010	6.00E-02	1.60E+01	1.60E+01		1.60E+01	5.00E-05		5.00E-05
Indeno(1,2,3-cd)pyren	6.000		7.30E-01	6.10E-01					
Phenanthrene	2.300	3.00E-01							
TH-Total	36.700	1.00E-02							

TABLE B3.6-0a
OU2-WIDE (Farmers)
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT(& future fed ownrshp; off-prop)			*FUTURE; 85% veg; lim. erosio*	*FUTURE; 50% veg; unlim. erosi*	*FUTURE; 85%*
	On-Subunit	On-Property	Off-Prop	On-Subunit [EX TRESP]	On-Subunit [FARM]	Off-Prop
Contaminant	Conc'n (pCi/m3	Conc'n (pCi/m3	Conc'n (pCi/m3	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3
CS-137	0.00E+00	4.44E-06	0.00E+00	0.00E+00	1.79E-04	8.80E-06
NP-237	0.00E+00	1.91E-06	0.00E+00	0.00E+00	8.38E-05	6.28E-06
PU-238	0.00E+00	1.03E-06	0.00E+00	0.00E+00	4.24E-05	2.36E-06
PU-239/240	0.00E+00	6.77E-07	0.00E+00	0.00E+00	2.75E-05	1.43E-06
RA-226	0.00E+00	2.74E-04	0.00E+00	0.00E+00	1.10E-02	1.10E-02
RA-228	0.00E+00	3.45E-05	0.00E+00	0.00E+00	1.39E-03	1.39E-03
SR-90	0.00E+00	1.42E-06	0.00E+00	0.00E+00	5.77E-04	2.90E-05
TC-99	0.00E+00	1.26E-03	0.00E+00	0.00E+00	5.07E-02	2.38E-03
TH-228	0.00E+00	3.93E-05	0.00E+00	0.00E+00	1.58E-03	7.63E-05
TH-230	0.00E+00	1.23E-04	0.00E+00	0.00E+00	4.94E-03	2.36E-04
TH-232	0.00E+00	3.55E-05	0.00E+00	0.00E+00	1.43E-03	6.87E-05
U-234	0.00E+00	7.71E-05	0.00E+00	0.00E+00	3.11E-03	1.53E-04
U-235/236	0.00E+00	7.90E-06	0.00E+00	0.00E+00	3.18E-04	1.54E-05
U-238	0.00E+00	8.29E-05	0.00E+00	0.00E+00	3.35E-03	1.68E-04
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3
Aroclor-1254	0.00E+00	7.92E-10	0.00E+00	0.00E+00	3.18E-08	1.50E-09
Aroclor-1260	0.00E+00	4.63E-10	0.00E+00	0.00E+00	1.86E-08	8.73E-10
Arsenic	0.00E+00	6.47E-08	0.00E+00	0.00E+00	2.73E-06	1.66E-07
Benzo(a)anthracene	0.00E+00	4.90E-08	0.00E+00	0.00E+00	1.96E-06	9.25E-08
Benzo(a)pyrene	0.00E+00	8.37E-08	0.00E+00	0.00E+00	3.36E-06	1.58E-07
Benzo(b)fluoranthene	0.00E+00	5.52E-08	0.00E+00	0.00E+00	2.21E-06	1.04E-07
Benzo(g,h,i)perylene	0.00E+00	5.52E-08	0.00E+00	0.00E+00	2.21E-06	1.04E-07
Benzo(k)fluoranthene	0.00E+00	6.50E-08	0.00E+00	0.00E+00	2.61E-06	1.23E-07
Beryllium	0.00E+00	8.39E-09	0.00E+00	0.00E+00	3.44E-07	1.83E-08
Lead	0.00E+00	2.19E-07	0.00E+00	0.00E+00	8.86E-06	4.43E-07
Dibenzo(a,h)anthracene	0.00E+00	1.69E-08	0.00E+00	0.00E+00	6.81E-07	3.22E-08
Dieldrin	0.00E+00	8.64E-11	0.00E+00	0.00E+00	3.57E-09	1.68E-10
Indeno(1,2,3-cd)pyrene	0.00E+00	5.34E-08	0.00E+00	0.00E+00	2.14E-06	1.01E-07
Phenanthrene	0.00E+00	2.05E-08	0.00E+00	0.00E+00	8.21E-07	3.88E-08
TH-Total	0.00E+00	3.27E-07	0.00E+00	0.00E+00	1.32E-05	6.31E-07

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TABLE B3.6-0a
OU2-WIDE (Farmers)
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER									
	On-Site	@ Bdry							
Contaminant	Conc'n (pCi/L	Conc'n (pCi/L)		SF(o)		SF (derm)			
NP-237	1.90E-02	2.00E-02		2.2E-10					
SR-90	2.70E-02	5.00E-02		3.6E-11					
TC-99	1.82E+00	9.81E-01		1.3E-12					
U-234	4.69E+02	2.54E+01		1.6E-11					
U-235/236	2.50E+01	1.35E+00		1.6E-11					
U-238	5.17E+02	2.80E+01		2.8E-11					
CHEM	(mg/L)	(mg/L)	Kp	SF(o)	SF(i)	SF (derm)	RfD(o)	RfD(i	RfD(derm)
Arsenic	0.00E+00	1.00E-07	1.00E-03	1.75E+00		########	3.00E-04		2.85E-04
Beryllium	0.00E+00	1.00E-08	1.00E-03	4.30E+00			5.00E-03		5.00E-05
Lead	1.43E-03	2.00E-05	4.00E-06						
U-total	1.80E+00	9.98E-02	1.00E-03				3.00E-03		1.50E-04

OU2EXEPC.XLS; 6/8/94; 6:52 PM

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TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	Conc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.440		2.8E-11	1.9E-11	2.0E-06				
NP-237	0.960		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.200		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.060		2.3E-10	3.8E-08	2.7E-11				
RA-226	16.760		7.8E-10	7.0E-09	6.0E-06				
RA-228	3.060		1.0E-10	6.9E-10	2.9E-06				
SR-90	1.660		3.6E-11	6.2E-11	0.0E+00				
TC-99	71.570		1.3E-12	8.3E-12	6.0E-13				
TH-228	3.620		5.5E-11	7.8E-08	5.6E-06				
TH-230	13.300		1.3E-11	2.9E-08	5.4E-11				
TH-232	3.020		1.7E-10	1.1E-07	8.5E-06				
U-234	12.400		1.6E-11	2.6E-08	3.0E-11				
U-235/236	1.020		1.6E-11	2.5E-08	2.4E-07				
U-238	21.350		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0.050	6.00E-02	7.70E+00			1.03E+01			
Aroclor-1260	0.030	6.00E-02	7.70E+00			1.03E+01			
Arsenic	21.660	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	2.900		7.30E-01	6.10E-01					
Benzo(a)pyrene	4.890		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	3.300		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	3.240	3.00E-01							
Benzo(k)fluoranthene	3.680		7.30E-02	6.10E-02					
Beryllium	1.660	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	21.400	1.00E-02							
Dibenzo(a,h)anthracen	1.410		7.30E+00	6.10E+00					
Dieldrin	0.000	6.00E-02	1.60E+01	1.60E+01		1.60E+01	5.00E-05		5.00E-05
Indeno(1,2,3-cd)pyren	3.140		7.30E-01	6.10E-01					
Phenanthrene	1.380	3.00E-01							
TH-Total	29.210	1.00E-02							
U-Total	23.19						3.00E-03		

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SF_EPC.XLS; 6/8/94; 7:00 PM

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TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

SURFACE WATER (NON-GMR)									
	Current and Future								
Contaminant	onc'n (pCi/L	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	3.53E+00		2.2E-10						
PU-238	1.77E-01		2.2E-10						
PU-239/240	1.97E-02		2.3E-10						
RA-226	2.94E+00		7.8E-10						
RA-228	5.02E-01		1.0E-10						
SR-90	9.33E-01		3.6E-11						
TC-99	8.42E+03		1.3E-12						
U-234	7.78E+01		1.6E-11						
U-235/236	8.38E+00		1.6E-11						
U-238	1.13E+02		2.8E-11						
CHEM	(mg/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm
Aroclor-1254	4.34E-07	6.2E-01	7.70E+00			1.03E+01			
Aroclor-1260	2.10E-07	3.8E+00	7.70E+00			1.03E+01			
Arsenic	2.25E-03	1.0E-03	1.75E+00			1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthr	7.19E-05	8.1E-01	7.30E-01	6.10E-01					
Benzo(a)pyre	5.15E-05	1.2E+00	7.30E+00	6.10E+00					
Benzo(b)fluor	8.67E-06	1.2E+00	7.30E-01	6.10E-01					
Benzo(g,h,i)p	2.45E-04	5.4E+00							
Beryllium	1.71E-04	1.0E-03	4.30E+00				5.00E-03		5.00E-05
Dibenzo(a,h)a	1.47E-05	2.7E+00	7.30E+00	6.10E+00					
Dieldrin	1.58E-05	1.6E-02	1.60E+01	1.60E+01		1.60E+01	5.00E-05		5.00E-05
Lead	1.25E-02	4.0E-06							
Phenanthrene	8.10E-02	2.3E-01							
U-Total	3.51E-01	1.0E-03					3.00E-03		1.50E-04

TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT(& future fed ownrshp; off-p		*FUTURE; 85% veg; lim. erosio*	*FUTURE; 50% veg; unlim. erosi*	*FUTURE; 50% veg; unlim. ero*	
	On-Subunit	Off-Prop	On-Subunit [EX TRESP]	On-Subunit [FARM]	Off-Prop	
Contaminant	Conc'n (pCi/m3	Conc'n (pCi/m3	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3)	
CS-137	0.00E+00	0.00E+00	5.59E-06	0.00E+00	0.00E+00	
NP-237	0.00E+00	0.00E+00	1.02E-05	0.00E+00	0.00E+00	
PU-238	0.00E+00	0.00E+00	2.48E-06	0.00E+00	0.00E+00	
PU-239/240	0.00E+00	0.00E+00	7.99E-07	0.00E+00	0.00E+00	
RA-226	0.00E+00	0.00E+00	1.67E-04	0.00E+00	0.00E+00	
RA-228	0.00E+00	0.00E+00	3.01E-05	0.00E+00	0.00E+00	
SR-90	0.00E+00	0.00E+00	1.66E-05	0.00E+00	0.00E+00	
TC-99	0.00E+00	0.00E+00	7.10E-04	0.00E+00	0.00E+00	
TH-228	0.00E+00	0.00E+00	3.75E-05	0.00E+00	0.00E+00	
TH-230	0.00E+00	0.00E+00	2.03E-04	0.00E+00	0.00E+00	
TH-232	0.00E+00	0.00E+00	2.92E-05	0.00E+00	0.00E+00	
U-234	0.00E+00	0.00E+00	1.25E-04	0.00E+00	0.00E+00	
U-235/236	0.00E+00	0.00E+00	1.08E-05	0.00E+00	0.00E+00	
U-238	0.00E+00	0.00E+00	2.80E-04	0.00E+00	0.00E+00	
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3)	
Aroclor-1254	0.00E+00	0.00E+00	6.11E-10	0.00E+00	0.00E+00	
Aroclor-1260	0.00E+00	0.00E+00	2.60E-10	0.00E+00	0.00E+00	
Arsenic	0.00E+00	0.00E+00	1.90E-07	0.00E+00	0.00E+00	
Benzo(a)anthracene	0.00E+00	0.00E+00	3.02E-08	0.00E+00	0.00E+00	
Benzo(a)pyrene	0.00E+00	0.00E+00	5.02E-08	0.00E+00	0.00E+00	
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.40E-08	0.00E+00	0.00E+00	
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	3.29E-08	0.00E+00	0.00E+00	
Benzo(k)fluoranthene	0.00E+00	0.00E+00	3.65E-08	0.00E+00	0.00E+00	
Beryllium	0.00E+00	0.00E+00	1.65E-08	0.00E+00	0.00E+00	
Lead	0.00E+00	0.00E+00	2.55E-07	0.00E+00	0.00E+00	
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	1.22E-08	0.00E+00	0.00E+00	
Dieldrin	0.00E+00	0.00E+00	1.00E-14	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.00E-20	0.00E+00	0.00E+00	
Phenanthrene	0.00E+00	0.00E+00	1.61E-08	0.00E+00	0.00E+00	
TH-Total	0.00E+00	0.00E+00	3.04E-07	0.00E+00	0.00E+00	
			6.03E-07			

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TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

SEDIMENT								
ion (ofrf private)	Current and Future							
Contaminant	Conc'n (pCi/g)		SF(o)	SF(e)				
NP-237	8.60E-01		2.2E-10	4.3E-07				
PU-238	0.158		2.2E-10	2.8E-11				
PU-239/240	0.0472		2.3E-10	2.7E-11				
RA-226	16.5		7.8E-10	6.0E-06				
RA-228	2.89		1.0E-10	2.9E-06				
SR-90	0.847		3.6E-11	0.0E+00				
TC-99	31.2		1.3E-12	6.0E-13				
U-234	9.65		1.6E-11	3.0E-11				
U-235/236	0.79		1.6E-11	2.4E-07				
U-238	13.2		2.8E-11	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0.0449	6.00E-02	7.70E+00		1.03E+01			
Aroclor-1260	0.0262	6.00E-02	7.70E+00		1.03E+01			
Arsenic	20.9	1.00E-03	1.75E+00		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	2.8		7.30E-01					
Benzo(a)pyrene	4.77		7.30E+00					
Benzo(b)fluoranthene	3.12		7.30E-01					
Benzo(g,h,i)perylene	3.17	3.00E-01						
Beryllium	1.5	1.00E-02	4.30E+00			5.00E-03		5.00E-05
Dibenzo(a,h)anthracen	1.37		7.3					
Dieldrin	4.81E-03	6.00E-02	16			5.00E-05		5.00E-05
Lead	24.8	1.00E-02						
Phenanthrene	1.21	3.00E-01						
U-TOTAL	3.98E+01	1.00E-02				3.00E-03		1.50E-04

TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

SUBSURFACE SOIL									
Contaminant	Conc'n (pCi/g)		SF(o)	SF(i)	SF(e)				
CS-137	0		2.8E-11	1.9E-11	2.0E-06				
NP-237	0		2.2E-10	2.9E-08	4.3E-07				
PB-210	0		6.6E-10	4.0E-09	1.6E-10				
PU-238	0		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0		2.3E-10	3.8E-08	2.7E-11				
RA-224	0		3.8E-11	1.2E-09	2.3E-08				
RA-226	0		7.8E-10	7.0E-09	6.0E-06				
RA-228	0		1.0E-10	6.9E-10	2.9E-06				
RU-106	0		9.5E-12	4.4E-10	0.0E+00				
TH-228	0		5.5E-11	7.8E-08	5.6E-06				
TH-230	0		1.3E-11	2.9E-08	5.4E-11				
TH-232	0		1.7E-10	1.1E-07	8.5E-06				
U-234	0		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0		1.6E-11	2.5E-08	2.4E-07				
U-238	0		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0	6.00E-02	7.70E+00			1.03E+01			
Aroclor-1260	0	6.00E-02	7.70E+00			1.03E+01			
Arsenic	0	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	0		7.30E-01	6.10E-01					
Benzo(a)pyrene	0		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	0		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	0	3.00E-01							
Beryllium	0	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	0	1.00E-02							
Dieldrin	0	6.00E-02	1.60E+01	1.60E+01			5.00E-05		5.00E-05
Phenanthrene	0	3.00E-01							
Tributyl Phosphate	0	3.00E-01					5.00E-03		4.50E-03
Octachlorodibenzo-p-dioxin	0	3.00E-02	1.50E+02	1.50E+02		3.00E+02			
Tetrachlorodibenzofuran	0	3.00E-02	1.50E+04	1.50E+04		3.00E+04			
TH-Total	0	1.00E-02							
U-Total	0	1.00E-02					3.00E-03		1.50E-04

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TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER									
	On-Site	@ Bdry							
Contaminant	Conc'n (pCi/L	Conc'n (pCi/L)		SF(o)		SF (derm)			
NP-237	0	0		2.2E-10					
TC-99	0	0		1.3E-12					
U-234	0	0		1.6E-11					
U-235/236	0	0		1.6E-11					
U-238	0	0		2.8E-11					
CHEM	(mg/L)	(mg/L)	Kp	SF(o)	SF(i)	SF (derm)	RfD(o)	RfD(i	RfD(derm)
2-Methylnaphthalene	0	0							
Lead	0	0	4.00E-06						
Tributyl phosphate	0	0					5.00E-03		4.50E-03
U-Total	0	0	1.00E-03				3.00E-03		1.50E-04

TABLE B3.6-0b
OU2-WIDE (Expanded Trespasser)
EXPOSURE POINT CONCENTRATIONS

GMR SURFACE WATER									
Contaminant	Conc'n (pCi/L	BCF	SF(o)	SF(i)	SF(e)				
NP-237	0.00E+00	1.00E+01	2.2E-10	2.9E-08	4.3E-07				
PU-238	0.00E+00	2.50E+01	2.2E-10	3.9E-08	2.8E-11				
RA-226	0.00E+00	5.00E+01	7.8E-10	7.0E-09	6.0E-06				
RA-228	0.00E+00	5.00E+01	1.0E-10	6.9E-10	2.9E-06				
SR-90	0.00E+00	3.00E+01	3.6E-11	6.2E-11	0.0E+00				
TC-99	0.00E+00	1.50E+01	1.3E-12	8.3E-12	6.0E-13				
U-234	0.00E+00	2.00E+00	1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.00E+00	2.00E+00	1.6E-11	2.5E-08	2.4E-07				
U-238	0.00E+00	2.00E+00	2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/L)	BCF	Kp	SF(o)	SF(i)	SF(derm)	RfD(o)	RfD(i	RfD(derm)
Arsenic	0.00E+00	4.40E+04	1.00E-03	1.75E+00		1.84E+00	3.00E-04		2.85E-04
Beryllium	0.00E+00	1.90E+04	1.00E-03	4.30E+00			5.00E-03		5.00E-05
Lead	0.00E+00	4.90E+04	4.00E-06						
Nickel	0.00E+00	4.70E+04	1.00E-03						
Benzo(a)anthracene	0.00E+00	1.18E+07	8.10E-01	7.30E-01	6.10E-01				
Benzo(a)pyrene	0.00E+00	2.55E+07	1.20E+00	7.30E+00	6.10E+00				
Benzo(b)fluoranthene	0.00E+00	2.64E+07	1.20E+00	7.30E-01	6.10E-01				
Benzo(g,h,i)perylene	0.00E+00	1.84E+08	5.37E+00						
bis(2-Ethylhexyl)phthalate	0.00E+00		6.23E-06	1.40E-02		1.40E-02			
Dibenzo(a,h)anthracene	0.00E+00	9.30E+07	2.70E+00	7.30E+00	6.10E+00				
Dieldrin	0.00E+00		1.60E-02	1.60E+01	1.60E+01	1.60E+01	5.00E-05		5.00E-05
U-TOTAL	0.00E+00	2.00E+00	1.00E-03				3.00E-03		1.50E-04
Phenanthrene	0.00E+00	1.75E+06	2.30E-01						

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TABLE B.3.6-1
FUTURE , OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
OU2 WIDE SURFACE SOIL
Carcinogenic Risk

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	8.80E-06	1.0E+00	1.9E-11	1.9E-11	1.9E-11
NP-237	6.28E-06	7.3E-01	2.9E-08	2.1E-08	2.1E-08
PU-238	2.36E-06	2.7E-01	3.9E-08	1.1E-08	1.1E-08
PU-239/240	1.43E-06	1.7E-01	3.8E-08	6.3E-09	6.3E-09
RA-226	1.10E-02	1.3E+03	7.0E-09	8.9E-06	8.9E-06
RA-228	1.39E-03	1.6E+02	6.9E-10	1.1E-07	1.1E-07
SR-90	2.90E-05	3.4E+00	6.2E-11	2.1E-10	2.1E-10
TC-99	2.38E-03	2.8E+02	8.3E-12	2.3E-09	2.3E-09
TH-228	7.63E-05	8.8E+00	7.8E-08	6.9E-07	6.9E-07
TH-230	2.36E-04	2.7E+01	2.9E-08	7.9E-07	7.9E-07
TH-232	6.87E-05	8.0E+00	1.1E-07	8.8E-07	8.8E-07
U-234	1.53E-04	1.8E+01	2.6E-08	4.6E-07	4.6E-07
U-235/236	1.54E-05	1.8E+00	2.5E-08	4.5E-08	4.5E-08
U-238	1.68E-04	1.9E+01	5.2E-08	1.0E-06	1.0E-06
			Total Pathway:	1.3E-05	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254	1.50E-09	9.7E-11			
Aroclor-1260	8.73E-10	5.7E-11			
Arsenic	1.66E-07	1.1E-08	1.5E+01	1.6E-07	1.6E-07
Benzo(a)anthracene	9.25E-08	6.0E-09	6.1E-01	3.7E-09	3.7E-09
Benzo(a)pyrene	1.58E-07	1.0E-08	6.1E+00	6.2E-08	6.2E-08
Benzo(b)fluoranthene	1.04E-07	6.7E-09	6.1E-01	4.1E-09	4.1E-09
Benzo(g,h,i)perylene	1.04E-07	6.7E-09			
Benzo(k)fluoranthene	1.23E-07	8.0E-09	6.1E-02	4.9E-10	4.9E-10
Beryllium	1.83E-08	1.2E-09	8.4E+00	1.0E-08	1.0E-08
Lead	4.43E-07	2.9E-08			
Dibenzo(a,h)anthracene	3.22E-08	2.1E-09	6.1E+00	1.3E-08	1.3E-08
Dieldrin	1.68E-10	1.1E-11	1.6E+01	1.7E-10	1.7E-10
Indeno(1,2,3-cd)pyrene	1.01E-07	6.5E-09	6.1E-01	4.0E-09	4.0E-09
Phenanthrene	3.88E-08	2.5E-09			
TH-Total	6.31E-07	4.1E-08			
			Total Pathway:	2.6E-07	

Total Rad + Chem 1.3E-05 *Total:* 1.3E-05

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TABLE B.3.6-1
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	8.80E-06			
NP-237	6.28E-06			
PU-238	2.36E-06			
PU-239/240	1.43E-06			
RA-226	1.10E-02			
RA-228	1.39E-03			
SR-90	2.90E-05			
TC-99	2.38E-03			
TH-228	7.63E-05			
TH-230	2.36E-04			
TH-232	6.87E-05			
U-234	1.53E-04			
U-235/236	1.54E-05			
U-238	1.68E-04			

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	1.50E-09	9.7E-11		
Aroclor-1260	8.73E-10	5.7E-11		
Arsenic	1.66E-07	1.1E-08		
Benzo(a)anthracene	9.25E-08	6.0E-09		
Benzo(a)pyrene	1.58E-07	1.0E-08		
Benzo(b)fluoranthene	1.04E-07	6.7E-09		
Benzo(g,h,i)perylene	1.04E-07	6.7E-09		
Benzo(k)fluoranthene	1.23E-07	8.0E-09		
Beryllium	1.83E-08	1.2E-09		
Lead	4.43E-07	2.9E-08		
Dibenzo(a,h)anthracene	3.22E-08	2.1E-09		
Dieldrin	1.68E-10	1.1E-11		
Indeno(1,2,3-cd)pyrene	1.01E-07	6.5E-09		
Phenanthrene	3.88E-08	2.5E-09		
TH-Total	6.31E-07	4.1E-08		

Total Pathway:

Total Rad + Chem

Total:

Total

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TABLE B.3.6-2
FUTURE OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
OU2 WIDE: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.98E-02	3.6E+01	2.8E-11	1.0E-09	CS-137	6.95E-03	5.1E+01	2.8E-11	1.4E-09	2.5E-09
NP-237	1.70E-05	3.1E-02	2.2E-10	6.9E-12	NP-237	1.54E-06	1.1E-02	2.2E-10	2.5E-12	9.3E-12
PU-238	5.98E-08	1.1E-04	2.2E-10	2.4E-14	PU-238	1.20E-08	8.8E-05	2.2E-10	1.9E-14	4.4E-14
PU-239/240	3.89E-08	7.1E-05	2.3E-10	1.6E-14	PU-239/240	7.78E-09	5.7E-05	2.3E-10	1.3E-14	3.0E-14
RA-226	1.96E-01	3.6E+02	7.8E-10	2.8E-07	RA-226	3.53E-01	2.6E+03	7.8E-10	2.0E-06	2.3E-06
RA-228	1.57E-02	2.9E+01	1.0E-10	2.9E-09	RA-228	2.85E-02	2.1E+02	1.0E-10	2.1E-08	2.4E-08
SR-90	9.77E-04	1.8E+00	3.6E-11	6.5E-11	SR-90	4.89E-03	3.6E+01	3.6E-11	1.3E-09	1.4E-09
TC-99	1.26E+00	2.3E+03	1.3E-12	3.0E-09	TC-99	1.48E+00	1.1E+04	1.3E-12	1.4E-08	1.7E-08
TH-228	1.86E-05	3.4E-02	5.5E-11	1.9E-12	TH-228	1.58E-05	1.2E-01	5.5E-11	6.4E-12	8.3E-12
TH-230	2.85E-04	5.2E-01	1.3E-11	6.8E-12	TH-230	2.37E-04	1.7E+00	1.3E-11	2.3E-11	2.9E-11
TH-232	8.32E-05	1.5E-01	1.7E-10	2.6E-11	TH-232	6.93E-05	5.1E-01	1.7E-10	8.7E-11	1.1E-10
U-234	1.32E-03	2.4E+00	1.6E-11	3.9E-11	U-234	3.97E-03	2.9E+01	1.6E-11	4.7E-10	5.1E-10
U-235/236	1.33E-04	2.4E-01	1.6E-11	3.9E-12	U-235/236	3.99E-04	2.9E+00	1.6E-11	4.7E-11	5.1E-11
U-238	1.45E-03	2.7E+00	2.8E-11	7.5E-11	U-238	4.35E-03	3.2E+01	2.8E-11	9.0E-10	9.7E-10
			Total Pathway:	2.9E-07				Total Pathway:	2.1E-06	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	1.32E-05	1.4E-08	7.7E+00	1.0E-07	Aroclor-1254	4.19E-06	1.7E-08	7.7E+00	1.3E-07	2.4E-07
Aroclor-1260	6.62E-05	6.8E-08	7.7E+00	5.2E-07	Aroclor-1260	2.09E-05	8.6E-08	7.7E+00	6.6E-07	1.2E-06
Arsenic	5.09E-05	5.2E-08	1.8E+00	9.2E-08	Arsenic	1.53E-06	6.3E-09	1.8E+00	1.1E-08	1.0E-07
Benzo(a)anthracene	5.16E-05	5.3E-08	7.3E-01	3.9E-08	Benzo(a)anthracene	1.64E-05	6.7E-08	7.3E-01	4.9E-08	8.8E-08
Benzo(a)pyrene	2.33E-04	2.4E-07	7.3E+00	1.8E-06	Benzo(a)pyrene	7.42E-05	3.0E-07	7.3E+00	2.2E-06	4.0E-06
Benzo(b)fluoranthene	1.58E-04	1.6E-07	7.3E-01	1.2E-07	Benzo(b)fluoranthene	5.01E-05	2.1E-07	7.3E-01	1.5E-07	2.7E-07
Benzo(g,h,i)perylene	1.98E-03	2.0E-06			Benzo(g,h,i)perylene	6.29E-04	2.6E-06			
Benzo(k)fluoranthene	1.11E-03	1.1E-06	7.3E-02	8.3E-08	Benzo(k)fluoranthene	3.52E-04	1.4E-06	7.3E-02	1.1E-07	1.9E-07
Beryllium	1.79E-06	1.8E-09	4.3E+00	7.9E-09	Beryllium	1.62E-09	6.6E-12	4.3E+00	2.9E-11	8.0E-09
Lead	6.60E-06	6.8E-09			Lead	5.50E-06	2.3E-08			
Dibenzo(a,h)anthracene	2.59E-04	2.7E-07	7.3E+00	1.9E-06	Dibenzo(a,h)anthracene	8.24E-05	3.4E-07	7.3E+00	2.5E-06	4.4E-06
Dieldrin	1.13E-10	1.2E-13	1.6E+01	1.9E-12	Dieldrin	3.57E-11	1.5E-13	1.6E+01	2.3E-12	4.2E-12
Indeno(1,2,3-cd)pyrene	4.40E-04	4.5E-07	7.3E-01	3.3E-07	Indeno(1,2,3-cd)pyrene	1.40E-04	5.7E-07	7.3E-01	4.2E-07	7.5E-07
Phenanthrene	1.60E-06	1.6E-09			Phenanthrene	5.15E-07	2.1E-09			
TH-Total	7.64E-07	7.9E-10			TH-Total	6.37E-07	2.6E-09			
			Total Pathway:	5.0E-06				Total Pathway:	6.2E-06	
			Total Rad + Chem	5.3E-06				Total Rad + Chem	8.3E-06	*Total:* 1.4E-05

TABLE B.3.6-2
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Ingestion/Milk Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	Total
CS-137	2.0E-02	3.6E+01			CS-137	6.95E-03	5.1E+01			
NP-237	1.7E-05	3.1E-02			NP-237	1.54E-06	1.1E-02			
PU-238	6.0E-08	1.1E-04			PU-238	1.20E-08	8.8E-05			
PU-239/240	3.9E-08	7.1E-05			PU-239/240	7.78E-09	5.7E-05			
RA-226	2.0E-01	3.6E+02			RA-226	3.53E-01	2.6E+03			
RA-228	1.6E-02	2.9E+01			RA-228	2.85E-02	2.1E+02			
SR-90	9.8E-04	1.8E+00			SR-90	4.89E-03	3.6E+01			
TC-99	1.3E+00	2.3E+03			TC-99	1.48E+00	1.1E+04			
TH-228	1.9E-05	3.4E-02			TH-228	1.58E-05	1.2E-01			
TH-230	2.8E-04	5.2E-01			TH-230	2.37E-04	1.7E+00			
TH-232	8.3E-05	1.5E-01			TH-232	6.93E-05	5.1E-01			
U-234	1.3E-03	2.4E+00			U-234	3.97E-03	2.9E+01			
U-235/236	1.3E-04	2.4E-01			U-235/236	3.99E-04	2.9E+00			
U-238	1.5E-03	2.7E+00			U-238	4.35E-03	3.2E+01			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Beef Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Ingestion/Milk Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	Total
Aroclor-1254	1.3E-05	1.4E-08			Aroclor-1254	4.2E-06	1.7E-08			
Aroclor-1260	6.6E-05	6.8E-08			Aroclor-1260	2.1E-05	8.6E-08			
Arsenic	5.1E-05	5.2E-08	3.0E-04	1.7E-04	Arsenic	1.5E-06	6.3E-09	3.0E-04	2.1E-05	2.0E-04
Benzo(a)anthracene	5.2E-05	5.3E-08			Benzo(a)anthracene	1.6E-05	6.7E-08			
Benzo(a)pyrene	2.3E-04	2.4E-07			Benzo(a)pyrene	7.4E-05	3.0E-07			
Benzo(b)fluoranthene	1.6E-04	1.6E-07			Benzo(b)fluoranthene	5.0E-05	2.1E-07			
Benzo(g,h,i)perylene	2.0E-03	2.0E-06			Benzo(g,h,i)perylene	6.3E-04	2.6E-06			
Benzo(k)fluoranthene	1.1E-03	1.1E-06			Benzo(k)fluoranthene	3.5E-04	1.4E-06			
Beryllium	1.8E-06	1.8E-09	5.0E-03	3.7E-07	Beryllium	1.6E-09	6.6E-12	5.0E-03	1.3E-09	3.7E-07
Lead	6.6E-06	6.8E-09			Lead	5.5E-06	2.3E-08			
Dibenzo(a,h)anthracene	2.6E-04	2.7E-07			Dibenzo(a,h)anthracene	8.2E-05	3.4E-07			
Dieldrin	1.1E-10	1.2E-13	5.0E-05	2.3E-09	Dieldrin	3.6E-11	1.5E-13	5.0E-05	2.9E-09	5.3E-09
Indeno(1,2,3-cd)pyrene	4.4E-04	4.5E-07			Indeno(1,2,3-cd)pyrene	1.4E-04	5.7E-07			
Phenanthrene	1.6E-06	1.6E-09			Phenanthrene	5.1E-07	2.1E-09			
TH-Total	7.6E-07	7.9E-10			TH-Total	6.4E-07	2.6E-09			
			Total Pathway:	1.7E-04				Total Pathway:	2.1E-05	
			Total Rad + Chem	1.7E-04				Total Rad + Chem	2.1E-05	Total: 2.0E-04

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TABLE B.3.6-2
(continued)
OU2 WIDE: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	3.59E-04	6.6E-01	2.2E-10	1.5E-10
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	1.08E-02	2.0E+01	3.6E-11	7.2E-10
TC-99	1.75E-01	3.2E+02	1.3E-12	4.2E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	5.72E-02	1.1E+02	1.6E-11	1.7E-09
U-235/236	1.48E+00	2.7E+03	1.6E-11	4.4E-08
U-238	7.88E-02	1.4E+02	2.8E-11	4.1E-09
			Total Pathway:	5.1E-08

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	3.36E-05	2.5E-01	2.2E-10	5.4E-11
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	5.49E-02	4.0E+02	3.6E-11	1.5E-08
TC-99	2.11E-01	1.5E+03	1.3E-12	2.0E-09
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.78E-01	1.3E+03	1.6E-11	2.1E-08
U-235/236	4.60E+00	3.4E+04	1.6E-11	5.4E-07
U-238	2.44E-01	1.8E+03	2.8E-11	5.0E-08
			Total Pathway:	6.3E-07

Chemical Risk

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic	1.69E-07	1.7E-10	1.8E+00	3.0E-10
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium	4.63E-09	4.8E-12	4.3E+00	2.0E-11
Lead	1.84E-06	1.9E-09		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
U-total	1.84E-04	1.9E-07		
			Total Pathway:	3.2E-10
			Total Rad + Chem	5.1E-08

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic	5.12E-09	2.1E-11	1.8E+00	3.7E-11
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium	4.26E-12	1.8E-14	4.3E+00	7.5E-14
Lead	1.58E-06	6.5E-09		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total				
U-total	6.01E-05	2.5E-07		
			Total Pathway:	3.7E-11
			Total Rad + Chem	6.3E-07

	Total	Total Dust & Groundwater Affected
CS-137		2.5E-09
NP-237	2.0E-10	2.1E-10
PU-238		4.4E-14
PU-239/240		3.0E-14
RA-226		2.3E-06
RA-228		2.4E-08
SR-90	1.5E-08	1.7E-08
TC-99	2.4E-09	2.0E-08
TH-228		8.3E-12
TH-230		2.9E-11
TH-232		1.1E-10
U-234	2.3E-08	2.3E-08
U-235/236	5.8E-07	5.8E-07
U-238	5.4E-08	5.5E-08
Aroclor-1254		2.4E-07
Aroclor-1260		1.2E-06
Arsenic	3.4E-10	1.0E-07
Benzo(a)anthracene		8.8E-08
Benzo(a)pyrene		4.0E-06
Benzo(b)fluoranthene		2.7E-07
Benzo(g,h,i)perylene		
Benzo(k)fluoranthene		
Beryllium	2.1E-11	8.0E-09
Lead		
Dibenzo(a,h)anthracene		4.4E-06
Dieldrin		4.2E-12
Indeno(1,2,3-cd)pyrene		7.5E-07
Phenanthrene		
TH-Total		
U-total		
Total:	6.8E-07	1.4E-05

TABLE B.3.6-2
(continued)
OU2 WIDE: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	3.6E-04	6.6E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.1E-02	2.0E+01		
TC-99	1.7E-01	3.2E+02		
TH-228				
TH-230				
TH-232				
U-234	5.7E-02	1.1E+02		
U-235/236	1.5E+00	2.7E+03		
U-238	7.9E-02	1.4E+02		

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	3.36E-05	2.5E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	5.49E-02	4.0E+02		
TC-99	2.11E-01	1.5E+03		
TH-228				
TH-230				
TH-232				
U-234	1.78E-01	1.3E+03		
U-235/236	4.60E+00	3.4E+04		
U-238	2.44E-01	1.8E+03		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic	1.7E-07	1.7E-10	3.0E-04	5.8E-07
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium	4.6E-09	4.8E-12	5.0E-03	9.5E-10
Lead	1.8E-06	1.9E-09		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
U-total	1.8E-04	1.9E-07	3.0E-03	6.3E-05

Total Pathway: 6.3E-05

Total Rad + Chem 6.3E-05

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic	5.1E-09	2.1E-11	3.0E-04	7.0E-08
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium	4.3E-12	1.8E-14	5.0E-03	3.5E-12
Lead	1.6E-06	6.5E-09		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
U-total	6.0E-05	2.5E-07	3.0E-03	8.2E-05

Total Pathway: 8.2E-05

Total Rad + Chem 8.2E-05

Total	Total Dust & Groundwater Affected
6.5E-07	2.0E-04
9.6E-10	3.7E-07
	5.3E-09
1.5E-04	1.5E-04
Total: 1.5E-04	3.4E-04

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TABLE B.3.6-3

FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)

OU2 WIDE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	6.07E-06	1.2E+01	2.8E-11	3.3E-10	CS-137	6.06E-06	6.3E+00	2.8E-11	1.8E-10	5.1E-10
NP-237	3.10E-06	6.1E+00	2.2E-10	1.3E-09	NP-237	3.10E-06	3.2E+00	2.2E-10	7.1E-10	2.1E-09
PU-238	1.16E-06	2.3E+00	2.2E-10	5.0E-10	PU-238	1.15E-06	1.2E+00	2.2E-10	2.7E-10	7.7E-10
PU-239/240	7.00E-07	1.4E+00	2.3E-10	3.2E-10	PU-239/240	7.00E-07	7.3E-01	2.3E-10	1.7E-10	4.9E-10
RA-226	5.54E-03	1.1E+04	7.8E-10	8.5E-06	RA-226	5.54E-03	5.8E+03	7.8E-10	4.5E-06	1.3E-05
RA-228	6.82E-04	1.3E+03	1.0E-10	1.3E-07	RA-228	6.76E-04	7.1E+02	1.0E-10	7.1E-08	2.0E-07
SR-90	1.59E-05	3.1E+01	3.6E-11	1.1E-09	SR-90	1.59E-05	1.7E+01	3.6E-11	6.0E-10	1.7E-09
TC-99	1.23E-03	2.4E+03	1.3E-12	3.1E-09	TC-99	1.23E-03	1.3E+03	1.3E-12	1.7E-09	4.8E-09
TH-228	3.73E-05	7.3E+01	5.5E-11	4.0E-09	TH-228	3.62E-05	3.8E+01	5.5E-11	2.1E-09	6.1E-09
TH-230	1.18E-04	2.3E+02	1.3E-11	3.0E-09	TH-230	1.18E-04	1.2E+02	1.3E-11	1.6E-09	4.6E-09
TH-232	3.43E-05	6.8E+01	1.7E-10	1.2E-08	TH-232	3.43E-05	3.6E+01	1.7E-10	6.1E-09	1.8E-08
U-234	7.50E-05	1.5E+02	1.6E-11	2.4E-09	U-234	7.50E-05	7.8E+01	1.6E-11	1.3E-09	3.6E-09
U-235/236	7.54E-06	1.5E+01	1.6E-11	2.4E-10	U-235/236	7.54E-06	7.9E+00	1.6E-11	1.3E-10	3.6E-10
U-238	8.23E-05	1.6E+02	2.8E-11	4.5E-09	U-238	8.23E-05	8.6E+01	2.8E-11	2.4E-09	6.9E-09
			Total Pathway:	8.7E-06				Total Pathway:	4.6E-06	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	2.78E-06	3.1E-09	7.7E+00	2.4E-08	Aroclor-1254	2.78E-06	1.6E-09	7.7E+00	1.3E-08	3.6E-08
Aroclor-1260	7.15E-07	7.9E-10	7.7E+00	6.1E-09	Aroclor-1260	7.15E-07	4.2E-10	7.7E+00	3.2E-09	9.3E-09
Arsenic	1.00E-04	1.1E-07	1.8E+00	1.9E-07	Arsenic	1.00E-04	5.8E-08	1.8E+00	1.0E-07	3.0E-07
Benzo(a)anthracene	4.87E-05	5.4E-08	7.3E-01	3.9E-08	Benzo(a)anthracene	4.84E-05	2.8E-08	7.3E-01	2.1E-08	6.0E-08
Benzo(a)pyrene	8.06E-05	8.9E-08	7.3E+00	6.5E-07	Benzo(a)pyrene	8.01E-05	4.7E-08	7.3E+00	3.4E-07	9.9E-07
Benzo(b)fluoranthen	5.27E-05	5.8E-08	7.3E-01	4.2E-08	Benzo(b)fluoranthene	5.22E-05	3.0E-08	7.3E-01	2.2E-08	6.5E-08
Benzo(g,h,i)perylene	5.13E-05	5.7E-08			Benzo(g,h,i)perylene	5.09E-05	3.0E-08			
Benzo(k)fluoranthen	6.31E-05	7.0E-08	7.3E-02	5.1E-09	Benzo(k)fluoranthene	6.30E-05	3.7E-08	7.3E-02	2.7E-09	7.8E-09
Beryllium	9.60E-06	1.1E-08	4.3E+00	4.5E-08	Beryllium	9.60E-06	5.6E-09	4.3E+00	2.4E-08	7.0E-08
Lead	2.26E-04	2.5E-07			Lead	2.26E-04	1.3E-07			
Dibenzo(a,h)anthrac	1.61E-05	1.8E-08	7.3E+00	1.3E-07	Dibenzo(a,h)anthracen	1.60E-05	9.3E-09	7.3E+00	6.8E-08	2.0E-07
Dieldrin	2.86E-07	3.1E-10	1.6E+01	5.0E-09	Dieldrin	2.86E-07	1.7E-10	1.6E+01	2.7E-09	7.7E-09
Indeno(1,2,3-cd)pyr	5.05E-05	5.6E-08	7.3E-01	4.1E-08	Indeno(1,2,3-cd)pyren	5.02E-05	2.9E-08	7.3E-01	2.1E-08	6.2E-08
Phenanthrene	2.02E-05	2.2E-08			Phenanthrene	1.97E-05	1.1E-08			
TH-Total	3.15E-04	3.5E-07			TH-Total	3.15E-04	1.8E-07			
			Total Pathway:	1.2E-06				Total Pathway:	6.2E-07	
			Total Rad + Chem	9.9E-06				Total Rad + Chem	5.2E-06	*Total:* 1.5E-05

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TABLE B.3.6-3
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	6.1E-06	1.2E+01			CS-137	6.06E-06	6.3E+00			
NP-237	3.1E-06	6.1E+00			NP-237	3.10E-06	3.2E+00			
PU-238	1.2E-06	2.3E+00			PU-238	1.15E-06	1.2E+00			
PU-239/240	7.0E-07	1.4E+00			PU-239/240	7.00E-07	7.3E-01			
RA-226	5.5E-03	1.1E+04			RA-226	5.54E-03	5.8E+03			
RA-228	6.8E-04	1.3E+03			RA-228	6.76E-04	7.1E+02			
SR-90	1.6E-05	3.1E+01			SR-90	1.59E-05	1.7E+01			
TC-99	1.2E-03	2.4E+03			TC-99	1.23E-03	1.3E+03			
TH-228	3.7E-05	7.3E+01			TH-228	3.62E-05	3.8E+01			
TH-230	1.2E-04	2.3E+02			TH-230	1.18E-04	1.2E+02			
TH-232	3.4E-05	6.8E+01			TH-232	3.43E-05	3.6E+01			
U-234	7.5E-05	1.5E+02			U-234	7.50E-05	7.8E+01			
U-235/236	7.5E-06	1.5E+01			U-235/236	7.54E-06	7.9E+00			
U-238	8.2E-05	1.6E+02			U-238	8.23E-05	8.6E+01			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254	2.8E-06	3.1E-09			Aroclor-1254	2.78E-06	1.6E-09			
Aroclor-1260	7.2E-07	7.9E-10			Aroclor-1260	7.15E-07	4.2E-10			
Arsenic	1.0E-04	1.1E-07	3.0E-04	3.7E-04	Arsenic	1.00E-04	5.8E-08	3.0E-04	1.9E-04	5.6E-04
Benzo(a)anthracene	4.9E-05	5.4E-08			Benzo(a)anthracene	4.84E-05	2.8E-08			
Benzo(a)pyrene	8.1E-05	8.9E-08			Benzo(a)pyrene	8.01E-05	4.7E-08			
Benzo(b)fluoranthene	5.3E-05	5.8E-08			Benzo(b)fluoranthene	5.22E-05	3.0E-08			
Benzo(g,h,i)perylene	5.1E-05	5.7E-08			Benzo(g,h,i)perylene	5.09E-05	3.0E-08			
Benzo(k)fluoranthene	6.3E-05	7.0E-08			Benzo(k)fluoranthene	6.30E-05	3.7E-08			
Beryllium	9.6E-06	1.1E-08	5.0E-03	2.1E-06	Beryllium	9.60E-06	5.6E-09	5.0E-03	1.1E-06	3.2E-06
Lead	2.3E-04	2.5E-07			Lead	2.26E-04	1.3E-07			
Dibenzo(a,h)anthracen	1.6E-05	1.8E-08			Dibenzo(a,h)anthracen	1.60E-05	9.3E-09			
Dieldrin	2.9E-07	3.1E-10	5.0E-05	6.3E-06	Dieldrin	2.86E-07	1.7E-10	5.0E-05	3.3E-06	9.6E-06
Indeno(1,2,3-cd)pyren	5.1E-05	5.6E-08			Indeno(1,2,3-cd)pyren	5.02E-05	2.9E-08			
Phenanthrene	2.0E-05	2.2E-08			Phenanthrene	1.97E-05	1.1E-08			
TH-Total	3.2E-04	3.5E-07			TH-Total	3.15E-04	1.8E-07			
		Total Pathway:		3.8E-04			Total Pathway:		2.0E-04	
		Total Rad + Chem		3.8E-04			Total Rad + Chem		2.0E-04	*Total:* 5.7E-04

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TABLE B.3.6-3

(continued)

OU2 WIDE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	9.91E-05	2.0E+02	2.2E-10	4.3E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.82E-04	5.6E+02	3.6E-11	2.0E-08
TC-99	2.61E-04	5.1E+02	1.3E-12	6.7E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.81E-03	9.5E+03	1.6E-11	1.5E-07
U-235/236	1.24E-01	2.5E+05	1.6E-11	3.9E-06
U-238	6.62E-03	1.3E+04	2.8E-11	3.6E-07
			Total Pathway:	4.5E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237	9.91E-05	1.0E+02	2.2E-10	2.3E-08
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.81E-04	2.9E+02	3.6E-11	1.1E-08
TC-99	2.61E-04	2.7E+02	1.3E-12	3.5E-10
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	4.81E-03	5.0E+03	1.6E-11	8.0E-08
U-235/236	1.24E-01	1.3E+05	1.6E-11	2.1E-06
U-238	6.62E-03	6.9E+03	2.8E-11	1.9E-07
			Total Pathway:	2.4E-06

Total	Total Dust & Groundwater Affected
	5.1E-10
6.6E-08	6.8E-08
	7.7E-10
	4.9E-10
	1.3E-05
	2.0E-07
3.1E-08	3.2E-08
1.0E-09	5.8E-09
	6.1E-09
	4.6E-09
	1.8E-08
2.3E-07	2.4E-07
6.0E-06	6.0E-06
5.6E-07	5.7E-07

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic	6.31E-07	7.0E-10	1.8E+00	1.2E-09
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02	
Beryllium	5.34E-08	5.9E-11	4.3E+00	2.5E-10
Lead	1.03E-04	1.1E-07		
Dibenzo(a,h)anthrac			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyr			7.3E-01	
Phenanthrene				
TH-Total				
U-total	4.89E-01	5.4E-04		
			Total Pathway:	1.5E-09
			Total Rad + Chem	4.5E-06

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic	6.31E-07	3.7E-10	1.8E+00	6.4E-10
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium	5.34E-08	3.1E-11	4.3E+00	1.3E-10
Lead	1.03E-04	6.0E-08		
Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyren			7.3E-01	
Phenanthrene				
TH-Total				
U-total	4.89E-01	2.9E-04		
			Total Pathway:	7.8E-10
			Total Rad + Chem	2.4E-06

Total	Total Dust & Groundwater Affected
	3.6E-08
	9.3E-09
1.9E-09	3.0E-07
	6.0E-08
	9.9E-07
	6.5E-08
	7.8E-09
3.9E-10	7.0E-08
	2.0E-07
	7.7E-09
	6.2E-08
Total:	6.9E-06	2.2E-05

TABLE B.3.6-3
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	9.9E-05	2.0E+02			NP-237	9.91E-05	1.0E+02				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	2.8E-04	5.6E+02			SR-90	2.81E-04	2.9E+02				
TC-99	2.6E-04	5.1E+02			TC-99	2.61E-04	2.7E+02				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	4.8E-03	9.5E+03			U-234	4.81E-03	5.0E+03				
U-235/236	1.2E-01	2.5E+05			U-235/236	1.24E-01	1.3E+05				
U-238	6.6E-03	1.3E+04			U-238	6.62E-03	6.9E+03				
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic	6.3E-07	7.0E-10	3.0E-04	2.3E-06	Arsenic	6.31E-07	3.7E-10	3.0E-04	1.2E-06	3.5E-06	5.7E-04
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium	5.3E-08	5.9E-11	5.0E-03	1.2E-08	Beryllium	5.34E-08	3.1E-11	5.0E-03	6.2E-09	1.8E-08	3.3E-06
Lead	1.0E-04	1.1E-07			Lead	1.03E-04	6.0E-08				
Dibenzo(a,h)anthracen					Dibenzo(a,h)anthracen						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			9.6E-06
Indeno(1,2,3-cd)pyren					Indeno(1,2,3-cd)pyren						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
U-total	4.9E-01	5.4E-04	3.0E-04	1.8E+00	U-total	4.89E-01	2.9E-04	3.0E-04	9.5E-01	2.7E+00	2.7E+00
		Total Pathway:		1.8E+00			Total Pathway:		9.5E-01		
		Total Rad + Chem		1.8E+00			Total Rad + Chem		9.5E-01	*Total:* 2.7E+00	2.7E+00

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TABLE B.3.6-4
FUTURE, OFF-PROPERTY FARMER (PRIVATE OWNERSHIP)
OU2 WIDE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237	2.0E-02	9.8E+02	2.2E-10	2.2E-07	
SR-90	5.0E-02	2.5E+03	3.6E-11	8.8E-08	Not applicable
TC-99	9.8E-01	4.8E+04	1.3E-12	6.2E-08	
U-234	2.5E+01	1.2E+06	1.6E-11	2.0E-05	
U-235/236	1.4E+00	6.6E+04	1.6E-11	1.1E-06	
U-238	2.8E+01	1.4E+06	2.8E-11	3.8E-05	
			Total Pathway:	6.0E-05	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
Arsenic	1.0E-07	2.7E-09	1.8E+00	4.8E-09	Arsenic	1.0E-08		
Beryllium	1.0E-08	2.7E-10	4.3E+00	1.2E-09	Beryllium	1.0E-09		
Lead	2.0E-05	5.5E-07			Lead	2.1E-06		
U-total	1.0E-01	2.7E-03			U-total	1.0E-02		
			Total Pathway:	6.0E-09			Total Pathway:	
			Total Rad + Chem	6.0E-05			Total Rad + Chem	

TABLE B.3.6-4
(continued)

CARCINOGENIC RISK

Radiation Risk				
Dermal Contact/Groundwater				**Total**
Not applicable				2.2E-07
				8.8E-08
				6.2E-08
				2.0E-05
				1.1E-06
				3.8E-05
Total Pathway:				

Chemical Risk				
Dermal Contact/Groundwater				
Compound	Intake	SF(derm)	Risk	
Arsenic	7.9E-12	1.8E+00	1.4E-11	4.8E-09
Beryllium	7.9E-13			1.2E-09
Lead	1.6E-09			
U-total	3.1E-08			
		Total Pathway:	1.4E-11	

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem 1.4E-11 *Total:* 6.0E-05

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TABLE B.3.6-4
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	2.0E-02	9.8E+02		
SR-90	5.0E-02	2.5E+03		
TC-99	9.8E-01	4.8E+04		
U-234	2.5E+01	1.2E+06		
U-235/236	1.4E+00	6.6E+04		
U-238	2.8E+01	1.4E+06		
			Total Pathway:	

Inhalation/Groundwater
Not applicable
Total Pathway:

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic	1.0E-07	2.7E-09	3.0E-04	9.1E-06
Beryllium	1.0E-08	2.7E-10	5.0E-03	5.5E-08
Lead	2.0E-05	5.5E-07		
U-total	1.0E-01	2.7E-03	3.0E-03	9.1E-01
			Total Pathway:	9.1E-01
			Total Rad + Chem	9.1E-01

Inhalation/Groundwater			
Compound	Intake	RfD(i)	Hazard
Arsenic	1.0E-08		
Beryllium	1.0E-09		
Lead	2.1E-06		
U-total	1.0E-02		
	Total Pathway:		
	Total Rad + Chem		

TABLE B.3.6-4
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
Total Pathway:				

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic	7.9E-12	2.9E-04	2.8E-08	9.2E-06
Beryllium	7.9E-13	5.0E-05	1.6E-08	7.1E-08
Lead	1.6E-09			
U-total	3.1E-08	1.5E-04	2.1E-04	9.1E-01
Total Pathway:			2.1E-04	

Total Rad + Chem 2.1E-04 *Total:* 9.1E-01

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TABLE B.3.6-5
FUTURE, ON-PROPERTY FARMER (RME VALUES)
OU2 WIDE: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	1.8E-04	2.1E+01	1.9E-11	3.9E-10
NP-237	8.4E-05	9.7E+00	2.9E-08	2.8E-07
PU-238	4.2E-05	4.9E+00	3.9E-08	1.9E-07
PU-239/240	2.8E-05	3.2E+00	3.8E-08	1.2E-07
RA-226	1.1E-02	1.3E+03	7.0E-09	8.9E-06
RA-228	1.4E-03	1.6E+02	6.9E-10	1.1E-07
SR-90	5.8E-04	6.7E+01	6.2E-11	4.1E-09
TC-99	5.1E-02	5.9E+03	8.3E-12	4.9E-08
TH-228	1.6E-03	1.8E+02	7.8E-08	1.4E-05
TH-230	4.9E-03	5.7E+02	2.9E-08	1.7E-05
TH-232	1.4E-03	1.7E+02	1.1E-07	1.8E-05
U-234	3.1E-03	3.6E+02	2.6E-08	9.4E-06
U-235/236	3.2E-04	3.7E+01	2.5E-08	9.2E-07
U-238	3.4E-03	3.9E+02	5.2E-08	2.0E-05
			Total Pathway:	8.9E-05

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.50	2.2E+03	2.8E-11	6.2E-08
NP-237	0.21	9.4E+02	2.2E-10	2.1E-07
PU-238	0.12	5.1E+02	2.2E-10	1.1E-07
PU-239/240	0.08	3.4E+02	2.3E-10	7.7E-08
RA-226	30.80	1.4E+05	7.8E-10	1.1E-04
RA-228	3.88	1.7E+04	1.0E-10	1.7E-06
SR-90	1.60	7.1E+03	3.6E-11	2.5E-07
TC-99	142	6.3E+05	1.3E-12	8.1E-07
TH-228	4.41	1.9E+04	5.5E-11	1.1E-06
TH-230	13.80	6.1E+04	1.3E-11	7.9E-07
TH-232	3.99	1.8E+04	1.7E-10	3.0E-06
U-234	8.66	3.8E+04	1.6E-11	6.1E-07
U-235/236	0.89	3.9E+03	1.6E-11	6.3E-08
U-238	9.31	4.1E+04	2.8E-11	1.1E-06
			Total Pathway:	1.2E-04

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	3.18E-08	2.1E-09		
Aroclor-1260	1.86E-08	1.2E-09		
Arsenic	2.73E-06	1.8E-07	1.5E+01	2.7E-06
Benzo(a)anthracene	1.96E-06	1.3E-07	6.1E-01	7.7E-08
Benzo(a)pyrene	3.36E-06	2.2E-07	6.1E+00	1.3E-06
Benzo(b)fluoranthene	2.21E-06	1.4E-07	6.1E-01	8.7E-08
Benzo(g,h,i)perylene	2.21E-06	1.4E-07		
Benzo(k)fluoranthene	2.61E-06	1.7E-07	6.1E-02	1.0E-08
Beryllium	3.44E-07	2.2E-08	8.4E+00	1.9E-07
Lead	8.86E-06	5.7E-07		
Dibenzo(a,h)anthracene	6.81E-07	4.4E-08	6.1E+00	2.7E-07
Dieldrin	3.57E-09	2.3E-10	1.6E+01	3.7E-09
Indeno(1,2,3-cd)pyrene	2.14E-06	1.4E-07	6.1E-01	8.5E-08
Phenanthrene	8.21E-07	5.3E-08		
TH-Total	1.32E-05	8.6E-07		
			Total Pathway:	4.7E-06
			Total Rad + Chem	9.4E-05

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.09	2.2E-07	7.7E+00	1.7E-06
Aroclor-1260	0.05	1.3E-07	7.7E+00	9.9E-07
Arsenic	7.27	1.8E-05	1.8E+00	3.1E-05
Benzo(a)anthracene	5.50	1.4E-05	7.3E-01	9.9E-06
Benzo(a)pyrene	9.40	2.3E-05	7.3E+00	1.7E-04
Benzo(b)fluoranthene	6.20	1.5E-05	7.3E-01	1.1E-05
Benzo(g,h,i)perylene	6.20	1.5E-05		
Benzo(k)fluoranthene	7.30	1.8E-05	7.3E-02	1.3E-06
Beryllium	0.94	2.3E-06	4.3E+00	1.0E-05
Lead	24.58	6.1E-05		
Dibenzo(a,h)anthracene	1.90	4.7E-06	7.3E+00	3.4E-05
Dieldrin	0.01	2.5E-08	1.6E+01	3.9E-07
Indeno(1,2,3-cd)pyrene	6.00	1.5E-05	7.3E-01	1.1E-05
Phenanthrene	2.30	5.7E-06		
TH-Total	36.70	9.0E-05		
			Total Pathway:	2.8E-04
			Total Rad + Chem	4.0E-04

TABLE B.3.6-5
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	2.1E+01	2.0E-06	4.1E-05	4.2E-05
	NP-237	8.9E+00	4.3E-07	3.8E-06	4.3E-06
	PU-238	4.8E+00	2.8E-11	1.3E-10	3.0E-07
	PU-239/24	3.2E+00	2.7E-11	8.5E-11	2.0E-07
	RA-226	1.3E+03	6.0E-06	7.7E-03	7.8E-03
	RA-228	1.6E+02	2.9E-06	4.7E-04	4.7E-04
	SR-90	6.6E+01			2.6E-07
	TC-99	5.9E+03	6.0E-13	3.5E-09	8.7E-07
	TH-228	1.8E+02	5.6E-06	1.0E-03	1.0E-03
	TH-230	5.7E+02	5.4E-11	3.1E-08	1.7E-05
	TH-232	1.7E+02	8.5E-06	1.4E-03	1.4E-03
	U-234	3.6E+02	3.0E-11	1.1E-08	1.0E-05
	U-235/236	3.7E+01	2.4E-07	8.8E-06	9.8E-06
	U-238	3.9E+02	3.6E-08	1.4E-05	3.5E-05
Total Pathway:			Total Pathway:	1.1E-02	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	4.2E-07	1.0E+01	4.3E-06					6.0E-06
Aroclor-1260	2.5E-07	1.0E+01	2.5E-06					3.5E-06
Arsenic	5.7E-07	1.8E+00	1.1E-06					3.5E-05
Benzo(a)anthracene			9.9E-06					2.0E-05
Benzo(a)pyrene			1.7E-04					3.4E-04
Benzo(b)fluoranthene			1.1E-05					2.2E-05
Benzo(g,h,i)perylene	1.5E-04							
Benzo(k)fluoranthene			1.3E-06					2.6E-06
Beryllium	7.4E-07		1.0E-05					2.0E-05
Lead	1.9E-05			Not applicable				
Dibenzo(a,h)anthracene			3.4E-05					6.9E-05
Dieldrin	4.7E-08	1.6E+01	7.6E-07					1.2E-06
Indeno(1,2,3-cd)pyrene			1.1E-05					2.2E-05
Phenanthrene	5.4E-05							
TH-Total	2.9E-05							
Total Pathway:			2.6E-04	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 2.6E-04 1.1E-02 *Total:* 1.1E-02

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TABLE B.3.6-5
(continued)

Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	1.79E-04	2.1E+01		
NP-237	8.38E-05	9.7E+00		
PU-238	4.24E-05	4.9E+00		
PU-239/240	2.75E-05	3.2E+00		
RA-226	1.10E-02	1.3E+03		
RA-228	1.39E-03	1.6E+02		
SR-90	5.77E-04	6.7E+01		
TC-99	5.07E-02	5.9E+03		
TH-228	1.58E-03	1.8E+02		
TH-230	4.94E-03	5.7E+02		
TH-232	1.43E-03	1.7E+02		
U-234	3.11E-03	3.6E+02		
U-235/236	3.18E-04	3.7E+01		
U-238	3.35E-03	3.9E+02		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	0.50	2.2E+03		
NP-237	0.21	9.4E+02		
PU-238	0.12	5.1E+02		
PU-239/240	0.08	3.4E+02		
RA-226	30.80	1.4E+05		
RA-228	3.88	1.7E+04		
SR-90	1.60	7.1E+03		
TC-99	142.00	6.3E+05		
TH-228	4.41	1.9E+04		
TH-230	13.80	6.1E+04		
TH-232	3.99	1.8E+04		
U-234	8.66	3.8E+04		
U-235/236	0.89	3.9E+03		
U-238	9.31	4.1E+04		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	3.18E-08	2.1E-09		
Aroclor-1260	1.86E-08	1.2E-09		
Arsenic	2.73E-06	1.8E-07		
Benzo(a)anthracene	1.96E-06	1.3E-07		
Benzo(a)pyrene	3.36E-06	2.2E-07		
Benzo(b)fluoranthene	2.21E-06	1.4E-07		
Benzo(g,h,i)perylene	2.21E-06	1.4E-07		
Benzo(k)fluoranthene	2.61E-06	1.7E-07		
Beryllium	3.44E-07	2.2E-08		
Lead	8.86E-06	5.7E-07		
Dibenzo(a,h)anthracene	6.81E-07	4.4E-08		
Dieldrin	3.57E-09	2.3E-10		
Indeno(1,2,3-cd)pyrene	2.14E-06	1.4E-07		
Phenanthrene	8.21E-07	5.3E-08		
TH-Total	1.32E-05	8.6E-07		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	0.09	2.2E-07		
Aroclor-1260	0.05	1.3E-07		
Arsenic	7.27	1.8E-05	3.0E-04	6.0E-02
Benzo(a)anthracene	5.50	1.4E-05		
Benzo(a)pyrene	9.40	2.3E-05		
Benzo(b)fluoranthene	6.20	1.5E-05		
Benzo(g,h,i)perylene	6.20	1.5E-05		
Benzo(k)fluoranthene	7.30	1.8E-05		
Beryllium	0.94	2.3E-06	5.0E-03	4.6E-04
Lead	24.58	6.1E-05		
Dibenzo(a,h)anthracene	1.90	4.7E-06		
Dieldrin	0.01	2.5E-08	5.0E-05	4.9E-04
Indeno(1,2,3-cd)pyrene	6.00	1.5E-05		
Phenanthrene	2.30	5.7E-06		
TH-Total	36.70	9.0E-05		

Total Pathway: 6.1E-02

Total Rad + Chem

Total Rad + Chem 6.1E-02

TABLE B.3.6-5
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	RfD(e)	Hazard	
Not applicable	CS-137	2.1E+01			
	NP-237	8.9E+00			
	PU-238	4.8E+00			
	PU-239/240	3.2E+00			
	RA-226	1.3E+03			
	RA-228	1.6E+02			
	SR-90	6.6E+01			
	TC-99	5.9E+03			
	TH-228	1.8E+02			
	TH-230	5.7E+02			
	TH-232	1.7E+02			
	U-234	3.6E+02			
	U-235/236	3.7E+01			
	U-238	3.9E+02			
Total Pathway:	Total Pathway:				

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	4.2E-07							
Aroclor-1260	2.5E-07							
Arsenic	5.7E-07	2.9E-04	2.0E-03					6.2E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.5E-04							
Benzo(k)fluoranthene								
Beryllium	7.4E-07	5.0E-05	1.5E-02					1.5E-02
Lead	1.9E-05			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin	4.7E-08	5.0E-05	9.5E-04					1.4E-03
Indeno(1,2,3-cd)pyrene								
Phenanthrene	5.4E-05							
TH-Total	2.9E-05							
Total Pathway:			1.8E-02	Total Pathway:				

Total Rad + Chem 1.8E-02

otal: 7.8E-02

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TABLE B.3.6-6
FUTURE ON-PROPERTY FARMER (RME VALUES)
OU2 WIDE: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	4.47E+01	8.2E+04	2.8E-11	2.3E-06	CS-137	1.57E+01	1.2E+05	2.8E-11	3.2E-06	5.5E-06
NP-237	6.47E-02	1.2E+02	2.2E-10	2.6E-08	NP-237	5.88E-03	4.3E+01	2.2E-10	9.5E-09	3.6E-08
PU-238	3.03E-05	5.6E-02	2.2E-10	1.2E-11	PU-238	6.06E-06	4.5E-02	2.2E-10	9.8E-12	2.2E-11
PU-239/240	1.99E-05	3.6E-02	2.3E-10	8.4E-12	PU-239/240	3.97E-06	2.9E-02	2.3E-10	6.7E-12	1.5E-11
RA-226	9.62E+00	1.8E+04	7.8E-10	1.4E-05	RA-226	1.73E+01	1.3E+05	7.8E-10	9.9E-05	1.1E-04
RA-228	1.19E+00	2.2E+03	1.0E-10	2.2E-07	RA-228	2.16E+00	1.6E+04	1.0E-10	1.6E-06	1.8E-06
SR-90	6.00E+01	1.1E+05	3.6E-11	4.0E-06	SR-90	3.00E+02	2.2E+06	3.6E-11	7.9E-05	8.3E-05
TC-99	5.74E+05	1.1E+09	1.3E-12	1.4E-03	TC-99	6.75E+05	5.0E+09	1.3E-12	6.5E-03	7.8E-03
TH-228	1.40E-02	2.6E+01	5.5E-11	1.4E-09	TH-228	1.19E-02	8.7E+01	5.5E-11	4.8E-09	6.2E-09
TH-230	4.49E-02	8.3E+01	1.3E-11	1.1E-09	TH-230	3.74E-02	2.8E+02	1.3E-11	3.6E-09	4.6E-09
TH-232	1.30E-02	2.4E+01	1.7E-10	4.1E-09	TH-232	1.08E-02	8.0E+01	1.7E-10	1.4E-08	1.8E-08
U-234	1.60E+00	2.9E+03	1.6E-11	4.7E-08	U-234	4.80E+00	3.5E+04	1.6E-11	5.6E-07	6.1E-07
U-235/236	1.64E-01	3.0E+02	1.6E-11	4.8E-09	U-235/236	4.92E-01	3.6E+03	1.6E-11	5.8E-08	6.3E-08
U-238	1.72E+00	3.2E+03	2.8E-11	8.9E-08	U-238	5.17E+00	3.8E+04	2.8E-11	1.1E-06	1.2E-06
			Total Pathway:	1.4E-03				Total Pathway:	6.6E-03	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254	2.71E-03	2.8E-06	7.7E+00	2.1E-05	Aroclor-1254	8.58E-04	3.5E-06	7.7E+00	2.7E-05	4.9E-05
Aroclor-1260	1.18E-02	1.2E-05	7.7E+00	9.3E-05	Aroclor-1260	3.72E-03	1.5E-05	7.7E+00	1.2E-04	2.1E-04
Arsenic	3.63E-02	3.7E-05	1.8E+00	6.5E-05	Arsenic	1.09E-03	4.5E-06	1.8E+00	7.8E-06	7.3E-05
Benzo(a)anthracene	9.59E-02	9.8E-05	7.3E-01	7.2E-05	Benzo(a)anthracene	3.04E-02	1.3E-04	7.3E-01	9.1E-05	1.6E-04
Benzo(a)pyrene	3.17E-01	3.3E-04	7.3E+00	2.4E-03	Benzo(a)pyrene	1.01E-01	4.1E-04	7.3E+00	3.0E-03	5.4E-03
Benzo(b)fluoranthene	2.15E-01	2.2E-04	7.3E-01	1.6E-04	Benzo(b)fluoranthene	6.84E-02	2.8E-04	7.3E-01	2.1E-04	3.7E-04
Benzo(g,h,i)perylene	1.65E+00	1.7E-03			Benzo(g,h,i)perylene	5.24E-01	2.2E-03			
Benzo(k)fluoranthene	9.05E-01	9.3E-04	7.3E-02	6.8E-05	Benzo(k)fluoranthene	2.87E-01	1.2E-03	7.3E-02	8.6E-05	1.5E-04
Beryllium	9.42E-04	9.7E-07	4.3E+00	4.2E-06	Beryllium	8.48E-07	3.5E-09	4.3E+00	1.5E-08	4.2E-06
Lead	5.93E-03	6.1E-06			Lead	4.94E-03	2.0E-05			
Dibenzo(a,h)anthracene	2.35E-01	2.4E-04	7.3E+00	1.8E-03	Dibenzo(a,h)anthracene	7.45E-02	3.1E-04	7.3E+00	2.2E-03	4.0E-03
Dieldrin	3.99E-06	4.1E-09	1.6E+01	6.6E-08	Dieldrin	1.26E-06	5.2E-09	1.6E+01	8.3E-08	1.5E-07
Indeno(1,2,3-cd)pyrene	4.57E-01	4.7E-04	7.3E-01	3.4E-04	Indeno(1,2,3-cd)pyrene	1.45E-01	6.0E-04	7.3E-01	4.4E-04	7.8E-04
Phenanthrene	1.00E-02	1.0E-05			Phenanthrene	3.22E-03	1.3E-05			
TH-Total	1.19E-04	1.2E-07			TH-Total	9.95E-05	4.1E-07			
			Total Pathway:	5.0E-03				Total Pathway:	6.2E-03	
			Total Rad + Chem	6.4E-03				Total Rad + Chem	1.3E-02	*Total:* 1.9E-02

TABLE B.3.6-6
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	4.5E+01	8.2E+04			CS-137	1.57E+01	1.2E+05			
NP-237	6.5E-02	1.2E+02			NP-237	5.88E-03	4.3E+01			
PU-238	3.0E-05	5.6E-02			PU-238	6.06E-06	4.5E-02			
PU-239/240	2.0E-05	3.6E-02			PU-239/240	3.97E-06	2.9E-02			
RA-226	9.6E+00	1.8E+04			RA-226	1.73E+01	1.3E+05			
RA-228	1.2E+00	2.2E+03			RA-228	2.16E+00	1.6E+04			
SR-90	6.0E+01	1.1E+05			SR-90	3.00E+02	2.2E+06			
TC-99	5.7E+05	1.1E+09			TC-99	6.75E+05	5.0E+09			
TH-228	1.4E-02	2.6E+01			TH-228	1.19E-02	8.7E+01			
TH-230	4.5E-02	8.3E+01			TH-230	3.74E-02	2.8E+02			
TH-232	1.3E-02	2.4E+01			TH-232	1.08E-02	8.0E+01			
U-234	1.6E+00	2.9E+03			U-234	4.80E+00	3.5E+04			
U-235/236	1.6E-01	3.0E+02			U-235/236	4.92E-01	3.6E+03			
U-238	1.7E+00	3.2E+03			U-238	5.17E+00	3.8E+04			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254	2.7E-03	2.8E-06			Aroclor-1254	8.6E-04	3.5E-06			
Aroclor-1260	1.2E-02	1.2E-05			Aroclor-1260	3.7E-03	1.5E-05			
Arsenic	3.6E-02	3.7E-05	3.0E-04	1.2E-01	Arsenic	1.1E-03	4.5E-06	3.0E-04	1.5E-02	1.4E-01
Benzo(a)anthracene	9.6E-02	9.8E-05			Benzo(a)anthracene	3.0E-02	1.3E-04			
Benzo(a)pyrene	3.2E-01	3.3E-04			Benzo(a)pyrene	1.0E-01	4.1E-04			
Benzo(b)fluoranthene	2.2E-01	2.2E-04			Benzo(b)fluoranthene	6.8E-02	2.8E-04			
Benzo(g,h,i)perylene	1.7E+00	1.7E-03			Benzo(g,h,i)perylene	5.2E-01	2.2E-03			
Benzo(k)fluoranthene	9.1E-01	9.3E-04			Benzo(k)fluoranthene	2.9E-01	1.2E-03			
Beryllium	9.4E-04	9.7E-07	5.0E-03	1.9E-04	Beryllium	8.5E-07	3.5E-09	5.0E-03	7.0E-07	1.9E-04
Lead	5.9E-03	6.1E-06			Lead	4.9E-03	2.0E-05			
Dibenzo(a,h)anthracene	2.3E-01	2.4E-04			Dibenzo(a,h)anthracene	7.4E-02	3.1E-04			
Dieldrin	4.0E-06	4.1E-09	5.0E-05	8.2E-05	Dieldrin	1.3E-06	5.2E-09	5.0E-05	1.0E-04	1.9E-04
Indeno(1,2,3-cd)pyrene	4.6E-01	4.7E-04			Indeno(1,2,3-cd)pyrene	1.5E-01	6.0E-04			
Phenanthrene	1.0E-02	1.0E-05			Phenanthrene	3.2E-03	1.3E-05			
TH-Total	1.2E-04	1.2E-07			TH-Total	1.0E-04	4.1E-07			
			Total Pathway:	1.2E-01				Total Pathway:	1.5E-02	
			Total Rad + Chem	1.2E-01				Total Rad + Chem	1.5E-02	*Total:* 1.4E-01

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TABLE B.3.6-6
(continued)
OU2 WIDE: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			5.5E-06
NP-237	3.41E-04	6.3E-01	2.2E-10	1.4E-10	NP-237	3.19E-05	2.3E-01	2.2E-10	5.2E-11	1.9E-10	3.6E-08
PU-238			2.2E-10		PU-238			2.2E-10			2.2E-11
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.5E-11
RA-226			7.8E-10		RA-226			7.8E-10			1.1E-04
RA-228			1.0E-10		RA-228			1.0E-10			1.8E-06
SR-90	5.84E-03	1.1E+01	3.6E-11	3.9E-10	SR-90	2.96E-02	2.2E+02	3.6E-11	7.8E-09	8.2E-09	8.3E-05
TC-99	9.43E-02	1.7E+02	1.3E-12	2.3E-10	TC-99	1.14E-01	8.4E+02	1.3E-12	1.1E-09	1.3E-09	7.8E-03
TH-228			5.5E-11		TH-228			5.5E-11			6.2E-09
TH-230			1.3E-11		TH-230			1.3E-11			4.6E-09
TH-232			1.7E-10		TH-232			1.7E-10			1.8E-08
U-234	1.06E-01	2.0E+02	1.6E-11	3.1E-09	U-234	3.30E-01	2.4E+03	1.6E-11	3.9E-08	4.2E-08	6.5E-07
U-235/236	2.74E+01	5.0E+04	1.6E-11	8.0E-07	U-235/236	8.49E+01	6.2E+05	1.6E-11	1.0E-05	1.1E-05	1.1E-05
U-238	1.46E+00	2.7E+03	2.8E-11	7.5E-08	U-238	4.53E+00	3.3E+04	2.8E-11	9.3E-07	1.0E-06	2.2E-06
			Total Pathway:	8.8E-07				Total Pathway:	1.1E-05		

Chemical Risk

Ingestion/Beef					Ingestion/Milk				
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00	
Arsenic			1.8E+00		Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00		Beryllium			4.3E+00	
Lead	1.32E-04	1.4E-07			Lead	1.13E-04	4.7E-07		
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01		Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene					Phenanthrene				
TH-Total					TH-Total				
U-total	3.31E-03	3.4E-06			U-total	1.08E-03	4.5E-06		
			Total Pathway:					Total Pathway:	
			Total Rad + Chem	8.8E-07				Total Rad + Chem	1.1E-05

		4.9E-05
		2.1E-04
		7.3E-05
		1.6E-04
		5.4E-03
		3.7E-04
		4.2E-06
		4.0E-03
		1.5E-07
		7.8E-04
Total:	1.2E-05	1.9E-02

TABLE B.3.6-6
(continued)
OU2 WIDE: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237	3.4E-04	6.3E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	5.8E-03	1.1E+01		
TC-99	9.4E-02	1.7E+02		
TH-228				
TH-230				
TH-232				
U-234	1.1E-01	2.0E+02		
U-235/236	2.7E+01	5.0E+04		
U-238	1.5E+00	2.7E+03		

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237	3.19E-05	2.3E-01		
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	2.96E-02	2.2E+02		
TC-99	1.14E-01	8.4E+02		
TH-228				
TH-230				
TH-232				
U-234	3.30E-01	2.4E+03		
U-235/236	8.49E+01	6.2E+05		
U-238	4.53E+00	3.3E+04		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.3E-04	1.4E-07		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
U-total	3.3E-03	3.4E-06	3.0E-03	1.1E-03

Total Pathway: 1.1E-03

Total Rad + Chem 1.1E-03

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	1.1E-04	4.7E-07		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
U-total	1.1E-03	4.5E-06	3.0E-03	1.5E-03

Total Pathway: 1.5E-03

Total Rad + Chem 1.5E-03

	Total	Total Dust & Groundwater Affected
Arsenic		1.4E-01
Beryllium		1.9E-04
Dieldrin		1.9E-04
U-total	2.6E-03	2.6E-03
Total:	2.6E-03	1.4E-01

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TABLE B.3.6-7

FUTURE, ON-PROPERTY FARMER (RME VALUES)

OU2 WIDE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	6.41E-03	1.3E+04	2.8E-11	3.5E-07	CS-137	6.40E-03	6.7E+03	2.8E-11	1.9E-07	5.4E-07
NP-237	9.16E-04	1.8E+03	2.2E-10	4.0E-07	NP-237	9.16E-04	9.6E+02	2.2E-10	2.1E-07	6.1E-07
PU-238	2.23E-06	4.4E+00	2.2E-10	9.7E-10	PU-238	2.23E-06	2.3E+00	2.2E-10	5.1E-10	1.5E-09
PU-239/240	1.46E-06	2.9E+00	2.3E-10	6.6E-10	PU-239/240	1.46E-06	1.5E+00	2.3E-10	3.5E-10	1.0E-09
RA-226	1.98E-02	3.9E+04	7.8E-10	3.0E-05	RA-226	1.98E-02	2.1E+04	7.8E-10	1.6E-05	4.6E-05
RA-228	2.49E-03	4.9E+03	1.0E-10	4.9E-07	RA-228	2.47E-03	2.6E+03	1.0E-10	2.6E-07	7.5E-07
SR-90	1.71E-01	3.4E+05	3.6E-11	1.2E-05	SR-90	1.71E-01	1.8E+05	3.6E-11	6.4E-06	1.9E-05
TC-99	9.12E+01	1.8E+08	1.3E-12	2.3E-04	TC-99	9.12E+01	9.5E+07	1.3E-12	1.2E-04	3.6E-04
TH-228	1.60E-04	3.2E+02	5.5E-11	1.7E-08	TH-228	1.56E-04	1.6E+02	5.5E-11	8.9E-09	2.6E-08
TH-230	5.02E-04	9.9E+02	1.3E-11	1.3E-08	TH-230	5.02E-04	5.2E+02	1.3E-11	6.8E-09	2.0E-08
TH-232	1.45E-04	2.9E+02	1.7E-10	4.9E-08	TH-232	1.45E-04	1.5E+02	1.7E-10	2.6E-08	7.4E-08
U-234	1.48E-02	2.9E+04	1.6E-11	4.7E-07	U-234	1.48E-02	1.5E+04	1.6E-11	2.5E-07	7.1E-07
U-235/236	1.52E-03	3.0E+03	1.6E-11	4.8E-08	U-235/236	1.52E-03	1.6E+03	1.6E-11	2.5E-08	7.3E-08
U-238	1.59E-02	3.1E+04	2.8E-11	8.8E-07	U-238	1.59E-02	1.7E+04	2.8E-11	4.7E-07	1.3E-06
			Total Pathway:	2.8E-04				Total Pathway:	1.5E-04	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254	4.83E-04	5.3E-07	7.7E+00	4.1E-06	Aroclor-1254	4.83E-04	2.8E-07	7.7E+00	2.2E-06	6.3E-06
Aroclor-1260	6.38E-05	7.0E-08	7.7E+00	5.4E-07	Aroclor-1260	6.38E-05	3.7E-08	7.7E+00	2.9E-07	8.3E-07
Arsenic	1.87E-02	2.1E-05	1.8E+00	3.6E-05	Arsenic	1.87E-02	1.1E-05	1.8E+00	1.9E-05	5.5E-05
Benzo(a)anthracene	4.88E-02	5.4E-05	7.3E-01	3.9E-05	Benzo(a)anthracene	4.84E-02	2.8E-05	7.3E-01	2.1E-05	6.0E-05
Benzo(a)pyrene	4.64E-02	5.1E-05	7.3E+00	3.7E-04	Benzo(a)pyrene	4.61E-02	2.7E-05	7.3E+00	2.0E-04	5.7E-04
Benzo(b)fluoranthene	2.98E-02	3.3E-05	7.3E-01	2.4E-05	Benzo(b)fluoranthene	2.96E-02	1.7E-05	7.3E-01	1.3E-05	3.7E-05
Benzo(g,h,i)perylene	6.80E-03	7.5E-06			Benzo(g,h,i)perylene	6.75E-03	3.9E-06			
Benzo(k)fluoranthene	1.35E-02	1.5E-05	7.3E-02	1.1E-06	Benzo(k)fluoranthene	1.34E-02	7.8E-06	7.3E-02	5.7E-07	1.7E-06
Beryllium	6.05E-04	6.7E-07	4.3E+00	2.9E-06	Beryllium	6.05E-04	3.5E-07	4.3E+00	1.5E-06	4.4E-06
Lead	6.41E-02	7.1E-05			Lead	6.41E-02	3.7E-05			
Dibenzo(a,h)anthracen	3.50E-03	3.9E-06	7.3E+00	2.8E-05	Dibenzo(a,h)anthracen	3.49E-03	2.0E-06	7.3E+00	1.5E-05	4.3E-05
Dieldrin	9.35E-03	1.0E-05	1.6E+01	1.6E-04	Dieldrin	9.35E-03	5.5E-06	1.6E+01	8.7E-05	2.5E-04
Indeno(1,2,3-cd)pyren	1.56E-02	1.7E-05	7.3E-01	1.3E-05	Indeno(1,2,3-cd)pyren	1.55E-02	9.1E-06	7.3E-01	6.6E-06	1.9E-05
Phenanthrene	8.70E-02	9.6E-05			Phenanthrene	8.48E-02	4.9E-05			
TH-Total	1.34E-03	1.5E-06			TH-Total	1.34E-03	7.8E-07			
			Total Pathway:	6.9E-04				Total Pathway:	3.6E-04	
			Total Rad + Chem	9.7E-04				Total Rad + Chem	5.1E-04	*Total:* 1.5E-03

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TABLE B.3.6-7
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	6.4E-03	1.3E+04		
NP-237	9.2E-04	1.8E+03		
PU-238	2.2E-06	4.4E+00		
PU-239/240	1.5E-06	2.9E+00		
RA-226	2.0E-02	3.9E+04		
RA-228	2.5E-03	4.9E+03		
SR-90	1.7E-01	3.4E+05		
TC-99	9.1E+01	1.8E+08		
TH-228	1.6E-04	3.2E+02		
TH-230	5.0E-04	9.9E+02		
TH-232	1.5E-04	2.9E+02		
U-234	1.5E-02	2.9E+04		
U-235/236	1.5E-03	3.0E+03		
U-238	1.6E-02	3.1E+04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	6.40E-03	6.7E+03		
NP-237	9.16E-04	9.6E+02		
PU-238	2.23E-06	2.3E+00		
PU-239/240	1.46E-06	1.5E+00		
RA-226	1.98E-02	2.1E+04		
RA-228	2.47E-03	2.6E+03		
SR-90	1.71E-01	1.8E+05		
TC-99	9.12E+01	9.5E+07		
TH-228	1.56E-04	1.6E+02		
TH-230	5.02E-04	5.2E+02		
TH-232	1.45E-04	1.5E+02		
U-234	1.48E-02	1.5E+04		
U-235/236	1.52E-03	1.6E+03		
U-238	1.59E-02	1.7E+04		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	4.8E-04	5.3E-07		
Aroclor-1260	6.4E-05	7.0E-08		
Arsenic	1.9E-02	2.1E-05	3.0E-04	6.9E-02
Benzo(a)anthracene	4.9E-02	5.4E-05		
Benzo(a)pyrene	4.6E-02	5.1E-05		
Benzo(b)fluoranthene	3.0E-02	3.3E-05		
Benzo(g,h,i)perylene	6.8E-03	7.5E-06		
Benzo(k)fluoranthene	1.3E-02	1.5E-05		
Beryllium	6.0E-04	6.7E-07	5.0E-03	1.3E-04
Lead	6.4E-02	7.1E-05		
Dibenzo(a,h)anthracen	3.5E-03	3.9E-06		
Dieldrin	9.4E-03	1.0E-05	5.0E-05	2.1E-01
Indeno(1,2,3-cd)pyren	1.6E-02	1.7E-05		
Phenanthrene	8.7E-02	9.6E-05		
TH-Total	1.3E-03	1.5E-06		

Total Pathway: 2.7E-01

Total Rad + Chem 2.7E-01

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	4.83E-04	2.8E-07		
Aroclor-1260	6.38E-05	3.7E-08		
Arsenic	1.87E-02	1.1E-05	3.0E-04	3.6E-02
Benzo(a)anthracene	4.84E-02	2.8E-05		
Benzo(a)pyrene	4.61E-02	2.7E-05		
Benzo(b)fluoranthene	2.96E-02	1.7E-05		
Benzo(g,h,i)perylene	6.75E-03	3.9E-06		
Benzo(k)fluoranthene	1.34E-02	7.8E-06		
Beryllium	6.05E-04	3.5E-07	5.0E-03	7.1E-05
Lead	6.41E-02	3.7E-05		
Dibenzo(a,h)anthracen	3.49E-03	2.0E-06		
Dieldrin	9.35E-03	5.5E-06	5.0E-05	1.1E-01
Indeno(1,2,3-cd)pyren	1.55E-02	9.1E-06		
Phenanthrene	8.48E-02	4.9E-05		
TH-Total	1.34E-03	7.8E-07		

Total Pathway: 1.5E-01

Total Rad + Chem 1.5E-01

Total

1.0E-01

2.0E-04

3.2E-01

Total: 4.2E-01

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TABLE B.3.6-7

(continued)

OU2 WIDE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			5.4E-07
NP-237	9.41E-05	1.9E+02	2.2E-10	4.1E-08	NP-237	9.41E-05	9.8E+01	2.2E-10	2.2E-08	6.2E-08	6.7E-07
PU-238			2.2E-10		PU-238			2.2E-10			1.5E-09
PU-239/240			2.3E-10		PU-239/240			2.3E-10			1.0E-09
RA-226			7.8E-10		RA-226			7.8E-10			4.6E-05
RA-228			1.0E-10		RA-228			1.0E-10			7.5E-07
SR-90	1.52E-04	3.0E+02	3.6E-11	1.1E-08	SR-90	1.52E-04	1.6E+02	3.6E-11	5.7E-09	1.7E-08	1.9E-05
TC-99	1.41E-04	2.8E+02	1.3E-12	3.6E-10	TC-99	1.41E-04	1.5E+02	1.3E-12	1.9E-10	5.5E-10	3.6E-04
TH-228			5.5E-11		TH-228			5.5E-11			2.6E-08
TH-230			1.3E-11		TH-230			1.3E-11			2.0E-08
TH-232			1.7E-10		TH-232			1.7E-10			7.4E-08
U-234	8.92E-03	1.8E+04	1.6E-11	2.8E-07	U-234	8.92E-03	9.3E+03	1.6E-11	1.5E-07	4.3E-07	1.1E-06
U-235/236	2.30E+00	4.5E+06	1.6E-11	7.2E-05	U-235/236	2.30E+00	2.4E+06	1.6E-11	3.8E-05	1.1E-04	1.1E-04
U-238	1.23E-01	2.4E+05	2.8E-11	6.8E-06	U-238	1.23E-01	1.3E+05	2.8E-11	3.6E-06	1.0E-05	1.2E-05
			Total Pathway:	8.0E-05				Total Pathway:	4.2E-05		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			6.3E-06
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			8.3E-07
Arsenic			1.8E+00		Arsenic			1.8E+00			5.5E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			6.0E-05
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			5.7E-04
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			3.7E-05
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthen			7.3E-02		Benzo(k)fluoranthene			7.3E-02			1.7E-06
Beryllium			4.3E+00		Beryllium			4.3E+00			4.4E-06
Lead	7.39E-03	8.1E-06			Lead	7.39E-03	4.3E-06				
Dibenzo(a,h)anthrac			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00			4.3E-05
Dieldrin			1.6E+01		Dieldrin			1.6E+01			2.5E-04
Indeno(1,2,3-cd)pyr			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01			1.9E-05
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
U-total	8.82E+00	9.7E-03			U-total	8.82E+00	5.1E-03				
			Total Pathway:					Total Pathway:			

Total Rad + Chem 8.0E-05

Total Rad + Chem 4.2E-05 | *Total:* 1.2E-04 | 1.6E-03

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TABLE B.3.6-7
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237	9.4E-05	1.9E+02			NP-237	9.41E-05	9.8E+01				
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	1.5E-04	3.0E+02			SR-90	1.52E-04	1.6E+02				
TC-99	1.4E-04	2.8E+02			TC-99	1.41E-04	1.5E+02				
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	8.9E-03	1.8E+04			U-234	8.92E-03	9.3E+03				
U-235/236	2.3E+00	4.5E+06			U-235/236	2.30E+00	2.4E+06				
U-238	1.2E-01	2.4E+05			U-238	1.23E-01	1.3E+05				
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			1.0E-01
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			2.0E-04
Lead	7.4E-03	8.1E-06			Lead	7.39E-03	4.3E-06				
Dibenzo(a,h)anthracen					Dibenzo(a,h)anthracen						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			3.2E-01
Indeno(1,2,3-cd)pyren					Indeno(1,2,3-cd)pyren						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
U-total	8.8E+00	9.7E-03	3.0E-03	3.2E+00	U-total	8.82E+00	5.1E-03	3.0E-03	1.7E+00	5.0E+00	5.0E+00
		Total Pathway:		3.2E+00			Total Pathway:		1.7E+00		
		Total Rad + Chem		3.2E+00			Total Rad + Chem		1.7E+00	*Total:* 5.0E+00	5.4E+00

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TABLE B.3.6-8
FUTURE, ON-PROPERTY FARMER (RME VALUES)
OU2 WIDE: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237	1.9E-02	9.3E+02	2.2E-10	2.0E-07	Not applicable
SR-90	2.7E-02	1.3E+03	3.6E-11	4.8E-08	
TC-99	1.8E+00	8.9E+04	1.3E-12	1.2E-07	
U-234	4.7E+02	2.3E+07	1.6E-11	3.7E-04	
U-235/236	2.5E+01	1.2E+06	1.6E-11	2.0E-05	
U-238	5.2E+02	2.5E+07	2.8E-11	7.1E-04	
			Total Pathway:	1.1E-03	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
Arsenic			1.8E+00		Arsenic			
Beryllium			4.3E+00		Beryllium			
Lead	1.4E-03	3.9E-05			Lead	1.5E-04		
U-total	1.8E+00	4.9E-02			U-total	1.8E-01		
			Total Pathway:					Total Pathway:
			Total Rad + Chem	1.1E-03				Total Rad + Chem

TABLE B.3.6-8
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	2.0E-07
	4.8E-08
	1.2E-07
	3.7E-04
	2.0E-05
	7.1E-04

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
Arsenic		1.8E+00	
Beryllium			
Lead	4.5E-10		
U-total	1.4E-04		

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 1.1E-03

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TABLE B.3.6-8
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237	1.9E-02	9.3E+02		
SR-90	2.7E-02	1.3E+03		
TC-99	1.8E+00	8.9E+04		
U-234	4.7E+02	2.3E+07		
U-235/236	2.5E+01	1.2E+06		
U-238	5.2E+02	2.5E+07		
			Total Pathway:	

Inhalation/Groundwater
Not applicable
Total Pathway:

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Lead	1.4E-03	3.9E-05		
U-total	1.8E+00	4.9E-02	3.0E-03	1.6E+01
			Total Pathway:	1.6E+01
			Total Rad + Chem	1.6E+01

Inhalation/Groundwater			
Compound	Intake	RfD(i)	Hazard
Arsenic			
Beryllium			
Lead	1.5E-04		
U-total	1.8E-01		
Total Pathway:			
Total Rad + Chem			

TABLE B.3.6-8
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Dermal Contact/Groundwater				**Total**
Not applicable				
		Total Pathway:		

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic		2.9E-04		
Beryllium		5.0E-05		
Lead	4.5E-10			
U-total	1.4E-04	1.5E-04	9.5E-01	1.7E+01
		Total Pathway:	9.5E-01	

Total Rad + Chem	9.5E-01	*Total:*	1.7E+01

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TABLE B.3.6-9
FUTURE, EXPANDED TRESPASSER
OU2 WIDE: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	5.6E-06	1.8E-02	1.9E-11	3.5E-13
NP-237	1.0E-05	3.3E-02	2.9E-08	9.6E-10
PU-238	2.5E-06	8.1E-03	3.9E-08	3.1E-10
PU-239/240	8.0E-07	2.6E-03	3.8E-08	9.9E-11
RA-226	1.7E-04	5.4E-01	7.0E-09	3.8E-09
RA-228	3.0E-05	9.8E-02	6.9E-10	6.8E-11
SR-90	1.7E-05	5.4E-02	6.2E-11	3.3E-12
TC-99	7.1E-04	2.3E+00	8.3E-12	1.9E-11
TH-228	3.8E-05	1.2E-01	7.8E-08	9.5E-09
TH-230	2.0E-04	6.6E-01	2.9E-08	1.9E-08
TH-232	2.9E-05	9.5E-02	1.1E-07	1.0E-08
U-234	1.3E-04	4.1E-01	2.6E-08	1.1E-08
U-235/236	1.1E-05	3.5E-02	2.5E-08	8.8E-10
U-238	2.8E-04	9.1E-01	5.2E-08	4.7E-08
			Total Pathway:	1.0E-07

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.44	1.4E+01	2.8E-11	4.0E-10
NP-237	0.96	3.1E+01	2.2E-10	6.9E-09
PU-238	0.20	6.5E+00	2.2E-10	1.4E-09
PU-239/240	0.06	2.0E+00	2.3E-10	4.5E-10
RA-226	16.76	5.4E+02	7.8E-10	4.2E-07
RA-228	3.06	9.9E+01	1.0E-10	9.9E-09
SR-90	1.66	5.4E+01	3.6E-11	1.9E-09
TC-99	72	2.3E+03	1.3E-12	3.0E-09
TH-228	3.62	1.2E+02	5.5E-11	6.5E-09
TH-230	13.30	4.3E+02	1.3E-11	5.6E-09
TH-232	3.02	9.8E+01	1.7E-10	1.7E-08
U-234	12.40	4.0E+02	1.6E-11	6.4E-09
U-235/236	1.02	3.3E+01	1.6E-11	5.3E-10
U-238	21.35	6.9E+02	2.8E-11	1.9E-08
			Total Pathway:	5.0E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254	6.11E-10	1.6E-12		
Aroclor-1260	2.60E-10	6.7E-13		
Arsenic	1.90E-07	4.9E-10	1.5E+01	7.4E-09
Benzo(a)anthracene	3.02E-08	7.8E-11	6.1E-01	4.8E-11
Benzo(a)pyrene	5.02E-08	1.3E-10	6.1E+00	7.9E-10
Benzo(b)fluoranthene	3.40E-08	8.8E-11	6.1E-01	5.4E-11
Benzo(g,h,i)perylene	3.29E-08	8.5E-11		
Benzo(k)fluoranthene	3.65E-08	9.4E-11	6.1E-02	5.8E-12
Beryllium	1.65E-08	4.3E-11	8.4E+00	3.6E-10
Lead	2.55E-07	6.6E-10		
Dibenzo(a,h)anthracene	1.22E-08	3.2E-11	6.1E+00	1.9E-10
Dieldrin	1.00E-14	2.6E-17	1.6E+01	4.1E-16
Indeno(1,2,3-cd)pyrene	1.00E-20	2.6E-23	6.1E-01	1.6E-23
Phenanthrene	1.61E-08	4.2E-11		
TH-Total	3.04E-07	7.9E-10		
U-Total	6.0E-07	1.6E-09		
2-methylnaphthalene	1.3E-10	3.3E-13		
bis(2-ethylhexyl)phthalate	2.8E-08	7.3E-11		
			Total Pathway:	8.8E-09

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254	0.05	1.2E-09	7.7E+00	9.2E-09
Aroclor-1260	0.03	7.2E-10	7.7E+00	5.5E-09
Arsenic	21.66	5.2E-07	1.8E+00	9.1E-07
Benzo(a)anthracene	2.90	6.9E-08	7.3E-01	5.1E-08
Benzo(a)pyrene	4.89	1.2E-07	7.3E+00	8.6E-07
Benzo(b)fluoranthene	3.30	7.9E-08	7.3E-01	5.8E-08
Benzo(g,h,i)perylene	3.24	7.8E-08		
Benzo(k)fluoranthene	3.68	8.8E-08	7.3E-02	6.4E-09
Beryllium	1.66	4.0E-08	4.3E+00	1.7E-07
Lead	21.40	5.1E-07		
Dibenzo(a,h)anthracene	1.41	3.4E-08	7.3E+00	2.5E-07
Dieldrin	0.00	2.4E-12	1.6E+01	3.8E-11
Indeno(1,2,3-cd)pyrene	3.14	7.5E-08	7.3E-01	5.5E-08
Phenanthrene	1.38	3.3E-08		
TH-Total	29.21	7.0E-07		
U-Total	23.19	5.6E-07		
2-methylnaphthalene	0.03	7.2E-10		
bis(2-ethylhexyl)phthalate	1.66	4.0E-08	1.40E-02	5.6E-10
			Total Pathway:	2.4E-06

Total Rad + Chem 1.1E-07

Total Rad + Chem 2.9E-06

TABLE B.3.6-9
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	SF(e)	Risk	
Not applicable	CS-137	2.0E-01	2.0E-06	3.9E-07	3.9E-07
	NP-237	4.3E-01	4.3E-07	1.8E-07	1.9E-07
	PU-238	8.9E-02	2.8E-11	2.5E-12	1.7E-09
	PU-239/24	2.7E-02	2.7E-11	7.2E-13	5.5E-10
	RA-226	7.5E+00	6.0E-06	4.5E-05	4.5E-05
	RA-228	1.4E+00	2.9E-06	4.0E-06	4.0E-06
	SR-90	7.4E-01			1.9E-09
	TC-99	3.2E+01	6.0E-13	1.9E-11	3.1E-09
	TH-228	1.6E+00	5.6E-06	9.1E-06	9.1E-06
	TH-230	6.0E+00	5.4E-11	3.2E-10	2.5E-08
	TH-232	1.4E+00	8.5E-06	1.1E-05	1.2E-05
	U-234	5.5E+00	3.0E-11	1.7E-10	1.7E-08
	U-235/236	4.6E-01	2.4E-07	1.1E-07	1.1E-07
	U-238	9.6E+00	3.6E-08	3.4E-07	4.1E-07
Total Pathway:	Total Pathway: 7.1E-05				

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	2.7E-08	1.0E+01	2.8E-07					2.9E-07
Aroclor-1260	1.6E-08	1.0E+01	1.7E-07					1.7E-07
Arsenic	2.0E-07	1.8E+00	3.7E-07					1.3E-06
Benzo(a)anthracene			5.1E-08					1.0E-07
Benzo(a)pyrene			8.6E-07					1.7E-06
Benzo(b)fluoranthene			5.8E-08					1.2E-07
Benzo(g,h,i)perylene	8.9E-06							
Benzo(k)fluoranthene			6.4E-09					1.3E-08
Beryllium	1.5E-07		1.7E-07					3.4E-07
Lead	2.0E-06			Not applicable				
Dibenzo(a,h)anthracene			2.5E-07					4.9E-07
Dieldrin	5.5E-11	1.6E+01	8.8E-10					9.2E-10
Indeno(1,2,3-cd)pyrene			5.5E-08					1.1E-07
Phenanthrene	3.8E-06							
TH-Total	2.7E-06							
U-Total								
2-methylnaphthalene								
bis(2-ethylhexyl)phthalate	6.1E-08	1.40E-02	5.6E-10					1.1E-09
		Total Pathway:	2.3E-06			Total Pathway:		
		Total Rad + Chem	2.3E-06				7.1E-05	*Total:* 7.6E-05

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TABLE B.3.6-9
(continued)
OU2 WIDE: SURFACE SOIL
Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	5.59E-06	1.8E-02		
NP-237	1.02E-05	3.3E-02		
PU-238	2.48E-06	8.1E-03		
PU-239/240	7.99E-07	2.6E-03		
RA-226	1.67E-04	5.4E-01		
RA-228	3.01E-05	9.8E-02		
SR-90	1.66E-05	5.4E-02		
TC-99	7.10E-04	2.3E+00		
TH-228	3.75E-05	1.2E-01		
TH-230	2.03E-04	6.6E-01		
TH-232	2.92E-05	9.5E-02		
U-234	1.25E-04	4.1E-01		
U-235/236	1.08E-05	3.5E-02		
U-238	2.80E-04	9.1E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	4.40E-01	1.4E+01		
NP-237	9.60E-01	3.1E+01		
PU-238	2.00E-01	6.5E+00		
PU-239/240	6.00E-02	2.0E+00		
RA-226	1.68E+01	5.4E+02		
RA-228	3.06E+00	9.9E+01		
SR-90	1.66E+00	5.4E+01		
TC-99	7.16E+01	2.3E+03		
TH-228	3.62E+00	1.2E+02		
TH-230	1.33E+01	4.3E+02		
TH-232	3.02E+00	9.8E+01		
U-234	1.24E+01	4.0E+02		
U-235/236	1.02E+00	3.3E+01		
U-238	2.14E+01	6.9E+02		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254	6.11E-10	2.5E-12		
Aroclor-1260	2.60E-10	1.1E-12		
Arsenic	1.90E-07	7.8E-10		
Benzo(a)anthracene	3.02E-08	1.2E-10		
Benzo(a)pyrene	5.02E-08	2.1E-10		
Benzo(b)fluoranthene	3.40E-08	1.4E-10		
Benzo(g,h,i)perylene	3.29E-08	1.4E-10		
Benzo(k)fluoranthene	3.65E-08	1.5E-10		
Beryllium	1.65E-08	6.8E-11		
Lead	2.55E-07	1.1E-09		
Dibenzo(a,h)anthracene	1.22E-08	5.0E-11		
Dieldrin	1.00E-14	4.1E-17		
Indeno(1,2,3-cd)pyrene	1.00E-20	4.1E-23		
Phenanthrene	1.61E-08	6.6E-11		
TH-Total	3.04E-07	1.3E-09		
U-Total	6.03E-07	2.5E-09		
2-methylnaphthalene	1.29E-10	5.3E-13		
bis(2-ethylhexyl)phthalate	2.81E-08	1.2E-10		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254	5.00E-02	1.9E-09		
Aroclor-1260	3.00E-02	1.1E-09		
Arsenic	2.17E+01	8.3E-07	3.0E-04	2.8E-03
Benzo(a)anthracene	2.90E+00	1.1E-07		
Benzo(a)pyrene	4.89E+00	1.9E-07		
Benzo(b)fluoranthene	3.30E+00	1.3E-07		
Benzo(g,h,i)perylene	3.24E+00	1.2E-07		
Benzo(k)fluoranthene	3.68E+00	1.4E-07		
Beryllium	1.66E+00	6.3E-08	5.0E-03	1.3E-05
Lead	2.14E+01	8.2E-07		
Dibenzo(a,h)anthracene	1.41E+00	5.4E-08		
Dieldrin	1.00E-04	3.8E-12	5.0E-05	7.6E-08
Indeno(1,2,3-cd)pyrene	3.14E+00	1.2E-07		
Phenanthrene	1.38E+00	5.3E-08		
TH-Total	2.92E+01	1.1E-06		
U-Total	2.32E+01	8.8E-07	3.0E-03	2.9E-04
2-methylnaphthalene	3.00E-02	1.1E-09		
bis(2-ethylhexyl)phthalate	1.66E+00	6.3E-08	2.0E-02	3.2E-06

Total Pathway: 3.1E-03

Total Rad + Chem 3.1E-03

TABLE B.3.6-9
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	RfD(e)	Hazard	
Not applicable	CS-137	2.0E-01			
	NP-237	4.3E-01			
	PU-238	8.9E-02			
	PU-239/240	2.7E-02			
	RA-226	7.5E+00			
	RA-228	1.4E+00			
	SR-90	7.4E-01			
	TC-99	3.2E+01			
	TH-228	1.6E+00			
	TH-230	6.0E+00			
	TH-232	1.4E+00			
	U-234	5.5E+00			
	U-235/236	4.6E-01			
	U-238	9.6E+00			
Total Pathway:	Total Pathway:				

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254	4.4E-08							
Aroclor-1260	2.6E-08							
Arsenic	3.2E-07	2.9E-04	1.1E-03					3.9E-03
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene	1.4E-05							
Benzo(k)fluoranthene								
Beryllium	2.4E-07	5.0E-05	4.8E-03					4.9E-03
Lead	3.1E-06			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin	8.7E-11	5.0E-05	1.7E-06					1.8E-06
Indeno(1,2,3-cd)pyrene								
Phenanthrene	6.0E-06							
TH-Total	4.3E-06							
U-Total								2.9E-04
2-methylnaphthalene								
bis(2-ethylhexyl)phthalate	9.7E-08	4.0E-03	2.4E-05					2.7E-05
Total Pathway:			6.0E-03	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 6.0E-03

otal: 9.0E-03

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TABLE B.3.6-10
FUTURE, EXPANDED TRESPASSER
OU2 WIDE: SURFACE WATER
Carcinogenic Risk

Radiation Risk

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk		
NP-237	3.53E+00	7.7E+01	2.2E-10	1.7E-08		1.7E-08
PU-238	1.77E-01	3.9E+00	2.2E-10	8.5E-10	Not applicable	8.5E-10
PU-239/240	1.97E-02	4.3E-01	2.3E-10	9.9E-11		9.9E-11
RA-226	2.94E+00	6.4E+01	7.8E-10	5.0E-08		5.0E-08
RA-228	5.02E-01	1.1E+01	1.0E-10	1.1E-09		1.1E-09
SR-90	9.33E-01	2.0E+01	3.6E-11	7.3E-10		7.3E-10
TC-99	8.42E+03	1.8E+05	1.3E-12	2.4E-07		2.4E-07
U-234	7.78E+01	1.7E+03	1.6E-11	2.7E-08		2.7E-08
U-235/236	8.38E+00	1.8E+02	1.6E-11	2.9E-09		2.9E-09
U-238	1.13E+02	2.5E+03	2.8E-11	6.9E-08		6.9E-08
			Total Pathway:	4.1E-07	Total Pathway:	

Chemical Risk

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	
Aroclor-1254	4.3E-07	8.6E-12	7.7E+00	6.6E-11	Aroclor-1254	7.8E-10	1.0E+01	8.0E-09	8.1E-09
Aroclor-1260	2.1E-07	4.2E-12	7.7E+00	3.2E-11	Aroclor-1260	2.3E-09	1.0E+01	3.2E-11	6.4E-11
Arsenic	2.3E-03	4.5E-08	1.8E+00	7.8E-08	Arsenic	6.6E-09	1.8E+00	7.8E-08	1.6E-07
Benzo(a)anthracene	7.2E-05	1.4E-09	7.3E-01	1.0E-09	Benzo(a)anthracene	1.7E-07		1.0E-09	2.1E-09
Benzo(a)pyrene	5.2E-05	1.0E-09	7.3E+00	7.5E-09	Benzo(a)pyrene	1.8E-07			7.5E-09
Benzo(b)fluoranthene	8.7E-06	1.7E-10	7.3E-01	1.3E-10	Benzo(b)fluoranthene	3.0E-08		1.3E-10	2.5E-10
Benzo(g,h,i)perylene	2.5E-04	4.9E-09			Benzo(g,h,i)perylene	3.8E-06			
Beryllium	1.7E-04	3.4E-09	4.3E+00	1.5E-08	Beryllium	5.0E-10			1.5E-08
Dibenzo(a,h)anthrace	1.5E-05	2.9E-10	7.3E+00	2.1E-09	Dibenzo(a,h)anthrace	1.2E-07			2.1E-09
Dieldrin	1.6E-05	3.1E-10	1.6E+01	5.0E-09	Dieldrin	7.4E-10	1.6E+01	1.2E-08	1.7E-08
Lead	1.3E-02	2.5E-07			Lead	1.5E-10			
Phenanthrene	8.1E-02	1.6E-06			Phenanthrene	5.4E-05			
U-Total	3.5E-01	7.0E-06			U-Total	1.0E-06			
			Total Pathway:	1.1E-07		Total Pathway:		9.9E-08	
			Total Rad + Chem	5.2E-07		Total Rad + Chem		9.9E-08	Total: 6.2E-07

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TABLE B.3.6-10
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water	Total
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard		
NP-237	3.53E+00	7.7E+01				
PU-238	1.77E-01	3.9E+00			Not applicable	
PU-239/240	1.97E-02	4.3E-01				
RA-226	2.94E+00	6.4E+01				
RA-228	5.02E-01	1.1E+01				
SR-90	9.33E-01	2.0E+01				
TC-99	8.42E+03	1.8E+05				
U-234	7.78E+01	1.7E+03				
U-235/236	8.38E+00	1.8E+02				
U-238	1.13E+02	2.5E+03				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Surface Water					Dermal Contact/Surface Water				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Aroclor-1254	4.34E-07	5.0E-11			Aroclor-1254	4.6E-09			
Aroclor-1260	2.10E-07	2.4E-11			Aroclor-1260	1.4E-08			
Arsenic	2.25E-03	2.6E-07	3.0E-04	8.7E-04	Arsenic	3.8E-08	2.9E-04	1.3E-04	1.0E-03
Benzo(a)anthracene	7.19E-05	8.3E-09			Benzo(a)anthracene	9.9E-07			
Benzo(a)pyrene	5.15E-05	6.0E-09			Benzo(a)pyrene	1.1E-06			
Benzo(b)fluoranthene	8.67E-06	1.0E-09			Benzo(b)fluoranthene	1.8E-07			
Benzo(g,h,i)perylene	2.45E-04	2.8E-08			Benzo(g,h,i)perylene	2.2E-05			
Beryllium	1.71E-04	2.0E-08	5.0E-03	4.0E-06	Beryllium	2.9E-09	5.0E-05	5.8E-05	6.2E-05
Dibenzo(a,h)anthrace	1.47E-05	1.7E-09			Dibenzo(a,h)anthrace	6.7E-07			
Dieldrin	1.58E-05	1.8E-09	5.0E-05	3.7E-05	Dieldrin	4.3E-09	5.0E-05	8.6E-05	1.2E-04
Lead	1.25E-02	1.4E-06			Lead	8.5E-10			
Phenanthrene	8.10E-02	9.4E-06			Phenanthrene	3.2E-04			
U-Total	3.51E-01	4.1E-05	3.0E-03	1.4E-02	U-Total	6.0E-06	1.5E-04	4.0E-02	5.3E-02
			Total Pathway:	1.4E-02			Total Pathway:	4.0E-02	
			Total Rad + Chem	1.4E-02			Total Rad + Chem	4.0E-02	Total: 5.5E-02

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TABLE B.3.6-11
FUTURE, EXPANDED TRESPASSER
OU2 WIDE: SEDIMENT
Carcinogenic Risk

Radiation Risk

Ingestion/Sediment					Dermal Contact/Sediment	External Radiation/Sediment				Total
Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk		Compound	Intake	SF(e)	Risk	
NP-237	8.60E-01	3.4E+00	2.2E-10	7.4E-10		NP-237	6.1E-02	4.3E-07	2.6E-08	2.7E-08
PU-238	1.58E-01	6.2E-01	2.2E-10	1.4E-10	Not applicable	PU-238	1.1E-02	2.8E-11	3.2E-13	1.4E-10
PU-239/240	4.72E-02	1.9E-01	2.3E-10	4.3E-11		PU-239/24	3.4E-03	2.7E-11	9.1E-14	4.3E-11
RA-226	1.65E+01	6.5E+01	7.8E-10	5.1E-08		RA-226	1.2E+00	6.0E-06	7.1E-06	7.1E-06
RA-228	2.89E+00	1.1E+01	1.0E-10	1.1E-09		RA-228	2.1E-01	2.9E-06	6.0E-07	6.0E-07
SR-90	8.47E-01	3.3E+00	3.6E-11	1.2E-10		SR-90	6.0E-02			1.2E-10
TC-99	3.12E+01	1.2E+02	1.3E-12	1.6E-10		TC-99	2.2E+00	6.0E-13	1.3E-12	1.6E-10
U-234	9.65E+00	3.8E+01	1.6E-11	6.1E-10		U-234	6.9E-01	3.0E-11	2.1E-11	6.3E-10
U-235/236	7.90E-01	3.1E+00	1.6E-11	5.0E-11		U-235/236	5.6E-02	2.4E-07	1.4E-08	1.4E-08
U-238	1.32E+01	5.2E+01	2.8E-11	1.5E-09		U-238	9.4E-01	3.6E-08	3.4E-08	3.5E-08
		Total Pathway:		5.5E-08	Total Pathway:			Total Pathway:		7.7E-06

Chemical Risk

Ingestion/Sediment					Dermal Contact/Sediment				External Radiation/Sediment				
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254	4.49E-02	1.6E-10	7.7E+00	1.2E-09	Aroclor-1254	7.8E-09	1.0E+01	1.2E-09					2.5E-09
Aroclor-1260	2.62E-02	9.4E-11	7.7E+00	7.2E-10	Aroclor-1260	4.6E-09	1.0E+01	7.2E-10					1.4E-09
Arsenic	2.09E+01	7.5E-08	1.8E+00	1.3E-07	Arsenic	6.1E-08	1.8E+00	1.1E-07					2.4E-07
Benzo(a)anthracene	2.80E+00	1.0E-08	7.3E-01	7.3E-09	Benzo(a)anthracene					Not applicable			7.3E-09
Benzo(a)pyrene	4.77E+00	1.7E-08	7.3E+00	1.2E-07	Benzo(a)pyrene			1.2E-07					2.5E-07
Benzo(b)fluoranthene	3.12E+00	1.1E-08	7.3E-01	8.1E-09	Benzo(b)fluoranthene								8.1E-09
Benzo(g,h,i)perylene	3.17E+00	1.1E-08			Benzo(g,h,i)perylene	2.8E-06							
Beryllium	1.50E+00	5.4E-09	4.3E+00	2.3E-08	Beryllium	4.4E-08		2.3E-08					4.6E-08
Dibenzo(a,h)anthracene	1.37E+00	4.9E-09	7.3E+00	3.6E-08	Dibenzo(a,h)anthracene								3.6E-08
Dieldrin	4.81E-03	1.7E-11	1.6E+01	2.8E-10	Dieldrin	8.4E-10		2.8E-10					5.5E-10
Lead	2.48E+01	8.9E-08			Lead	7.2E-07							
Phenanthrene	1.21E+00	4.3E-09			Phenanthrene	1.1E-06							
U-TOTAL	3.98E+01	1.4E-07			U-TOTAL	1.2E-06							
		Total Pathway:		3.3E-07		Total Pathway:		2.6E-07		Total Pathway:			

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem	3.9E-07	Total Rad + Chem	2.6E-07	Total Rad + Chem	7.7E-06	*Total:*	8.4E-06

TABLE B.3.6-11
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion/Sediment					Dermal Contact/Sediment	**Total**
Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard		
NP-237	0.86	3.4E+00			Not applicable	
PU-238	0.16	6.2E-01				
PU-239/240	0.05	1.9E-01				
RA-226	16.50	6.5E+01				
RA-228	2.89	1.1E+01				
SR-90	0.85	3.3E+00				
TC-99	31.20	1.2E+02				
U-234	9.65	3.8E+01				
U-235/236	0.79	3.1E+00				
U-238	13.20	5.2E+01				
			Total Pathway:		Total Pathway:	

Chemical Hazard

Ingestion/Sediment					Dermal Contact/Sediment				
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(derm)	Hazard	
Aroclor-1254	4.49E-02	9.4E-10			Aroclor-1254	4.6E-08			
Aroclor-1260	2.62E-02	5.5E-10			Aroclor-1260	2.7E-08			
Arsenic	2.09E+01	4.4E-07	3.0E-04	1.5E-03	Arsenic	3.6E-07	2.9E-04	1.2E-03	2.7E-03
Benzo(a)anthracene	2.80E+00	5.8E-08			Benzo(a)anthracene				
Benzo(a)pyrene	4.77E+00	1.0E-07			Benzo(a)pyrene				
Benzo(b)fluoranthene	3.12E+00	6.5E-08			Benzo(b)fluoranthene				
Benzo(g,h,i)perylene	3.17E+00	6.6E-08			Benzo(g,h,i)perylene	1.6E-05			
Beryllium	1.50E+00	3.1E-08	5.0E-03	6.3E-06	Beryllium	2.5E-07	5.0E-05	5.1E-03	5.1E-03
Dibenzo(a,h)anthracene	1.37E+00	2.9E-08			Dibenzo(a,h)anthracene				
Dieldrin	4.81E-03	1.0E-10	5.0E-05	2.0E-06	Dieldrin	4.9E-09	5.0E-05	9.8E-05	1.0E-04
Lead	2.48E+01	5.2E-07			Lead	4.2E-06			
Phenanthrene	1.21E+00	2.5E-08			Phenanthrene	6.2E-06			
U-TOTAL	3.98E+01	8.3E-07	3.0E-03	2.8E-04	U-TOTAL	6.8E-06	1.5E-04	4.5E-02	4.5E-02
			Total Pathway:	1.7E-03			Total Pathway:	5.2E-02	
			Total Rad + Chem	1.7E-03			Total Rad + Chem	5.2E-02	*Total:* 5.3E-02

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TABLE B4-0a
ACTIVE FLYASH PILE BACKGROUND
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.44		2.8E-11	1.9E-11	2.0E-06				
NP-237	0		2.2E-10	2.9E-08	4.3E-07				
PU-238	0		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.23		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.14		1.0E-10	6.9E-10	2.9E-06				
SR-90	0		3.6E-11	6.2E-11	0.0E+00				
TH-228	1.12		5.5E-11	7.8E-08	5.6E-06				
TH-230	1.5		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.08		1.7E-10	1.1E-07	8.5E-06				
U-234	1.04		1.6E-11	2.6E-08	3.0E-11				
U-235/236	8.80E-02		1.6E-11	2.5E-08	2.4E-07				
U-238	1.09		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	5.78	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	6.00E-01	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	19.2	1.00E-02							
Thallium	0.58	1.00E-02					7.00E-05		7.00E-05
TH-TOTAL	10.7								
2-Methylnaphthalene	0	3.00E-01							
Benzo(a)anthracene	0		7.30E-01	6.10E-01					
Benzo(a)pyrene	0		7.30E+00	6.10E+00					
Benzo(b)fluoranthen	0		7.30E-01	6.10E-01					
Phenanthrene	0	3.00E-01	-						

TABLE B4-0a
ACTIVE FLYASH PILE BACKGROUND
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT			*FUTURE*		
	On-Subunit	On-Property	Off-Prop	On-Subunit	On-Property	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m
CS-137	0.00E+00	3.11E-06	0.00E+00	0.00E+00	3.11E-06	0.00E+00
NP-237	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-239/240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RA-226	0.00E+00	9.21E-06	0.00E+00	0.00E+00	9.21E-06	0.00E+00
RA-228	0.00E+00	8.55E-06	0.00E+00	0.00E+00	8.55E-06	0.00E+00
SR-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-228	0.00E+00	8.39E-06	0.00E+00	0.00E+00	8.39E-06	0.00E+00
TH-230	0.00E+00	1.12E-05	0.00E+00	0.00E+00	1.12E-05	0.00E+00
TH-232	0.00E+00	8.09E-06	0.00E+00	0.00E+00	8.09E-06	0.00E+00
U-234	0.00E+00	7.77E-06	0.00E+00	0.00E+00	7.77E-06	0.00E+00
U-235/236	0.00E+00	6.60E-07	0.00E+00	0.00E+00	6.60E-07	0.00E+00
U-238	0.00E+00	8.08E-06	0.00E+00	0.00E+00	8.08E-06	0.00E+00
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3
Arsenic	0.00E+00	4.34E-08	0.00E+00	0.00E+00	4.34E-08	0.00E+00
Beryllium	0.00E+00	4.50E-09	0.00E+00	0.00E+00	4.50E-09	0.00E+00
Lead	0.00E+00	1.44E-07	0.00E+00	0.00E+00	1.44E-07	0.00E+00
Thallium	0.00E+00	4.35E-09	0.00E+00	0.00E+00	4.35E-09	0.00E+00
TH-TOTAL	0.00E+00	8.03E-08	0.00E+00	0.00E+00	8.03E-08	0.00E+00
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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TABLE B4-0a
ACTIVE FLYASH PILE BACKGROUND
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER										
	on-site	FEMP								
	100 yrs	Bdry (120 yrs)								
Contamina	onc'n (pCi/l	Conc'n (pCi/l)		SF(o)	SF(i)	SF(e)				
NP-237	0.00E+00	0.00E+00		2.2E-10	2.9E-08	4.3E-07				
RA-226	0.00E+00	0.00E+00		7.8E-10	7.0E-09	6.0E-06				
SR-90	1.50E-01	0.00E+00		3.6E-11	6.2E-11	0.0E+00				
U-234	3.54E+00	0.00E+00		1.6E-11	2.6E-08	3.0E-11				
U-235/236	3.19E-01	0.00E+00		1.6E-11	2.5E-08	2.4E-07				
U-238	3.55E+00	0.00E+00		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/l)	(mg/l)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	0.00E+00	0.00E+00	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	0.00E+00	0.00E+00	1.00E-03	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	4.87E-13	0.00E+00	4.00E-06							
U-Total	1.07E-02	0.00E+00	1.00E-03					3.00E-03		1.50E-04
2-Methyln	0.00E+00	0	1.42E-01							

ABKD_EPC.XLS; 6/8/94; 6:46 PM

001710

TABLE B4-0b
SOUTH FIELD BACKGROUND
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	Conc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	0.440		2.8E-11	1.9E-11	2.0E-06				
NP-237	0.000		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.000		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.000		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.230		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.140		1.0E-10	6.9E-10	2.9E-06				
SR-90	0.000		3.6E-11	6.2E-11	0.0E+00				
TC-99	0.000		1.3E-12	8.3E-12	6.0E-13				
TH-228	1.120		5.5E-11	7.8E-08	5.6E-06				
TH-230	1.500		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.080		1.7E-10	1.1E-07	8.5E-06				
U-234	1.040		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.088		1.6E-11	2.5E-08	2.4E-07				
U-238	1.080		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0.000	1.00E-02	7.70E+00			1.03E+01			
Aroclor-1260	0.000	1.00E-02	7.70E+00			1.03E+01			
Arsenic	5.780	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	0.000		7.30E-01	6.10E-01					
Benzo(a)pyrene	0.000		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	0.000		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	0.000	3.00E-01							
Benzo(k)fluoranthene	0.000		7.30E-02	6.10E-02					
Beryllium	0.600	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	19.200	1.00E-02							
Dibenzo(a,h)anthracen	0.000		7.30E+00	6.10E+00					
Dieldrin	0.000	6.00E-02	1.60E+01	1.60E+01		1.60E+01	5.00E-05		5.00E-05
Indeno(1,2,3-cd)pyren	0.000		7.30E-01	6.10E-01					
Phenanthrene	0.000	3.00E-01							
TH-Total	10.700	1.00E-02							

001411

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TABLE B4-0b
SOUTH FIELD BACKGROUND
EXPOSURE POINT CONCENTRATIONS

AIR					
	CURRENT(& future fed ownrshp; off-p		*FUTURE; 85% veg; lim. erosio*	*FUTURE; 50% veg; unlim. erosi*	*FUTURE; 85% v*
	On-Subunit	Off-Prop	On-Subunit [EX TRESP]	On-Subunit [FARM]	Off-Prop
Contaminant	Conc'n (pCi/m3	Conc'n (pCi/m3	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3
CS-137	0.00E+00	0.00E+00	0.00E+00	7.03E-05	0.00E+00
NP-237	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-239/240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RA-226	0.00E+00	0.00E+00	0.00E+00	4.39E-04	0.00E+00
RA-228	0.00E+00	0.00E+00	0.00E+00	4.05E-04	0.00E+00
SR-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TC-99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-228	0.00E+00	0.00E+00	0.00E+00	3.99E-04	0.00E+00
TH-230	0.00E+00	0.00E+00	0.00E+00	5.36E-04	0.00E+00
TH-232	0.00E+00	0.00E+00	0.00E+00	3.84E-04	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	3.71E-04	0.00E+00
U-235/236	0.00E+00	0.00E+00	0.00E+00	3.18E-05	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	3.85E-04	0.00E+00
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3
Aroclor-1254	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	0.00E+00	2.37E-06	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	0.00E+00	0.00E+00	0.00E+00	2.46E-07	0.00E+00
Lead	0.00E+00	0.00E+00	0.00E+00	7.87E-06	0.00E+00
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-Total	0.00E+00	0.00E+00	0.00E+00	4.39E-06	0.00E+00

TABLE B4-0b
SOUTH FIELD BACKGROUND
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER									
	On-Site	@ Bdry							
Contaminant	Conc'n (pCi/L	Conc'n (pCi/L)		SF(o)		SF (derm)			
NP-237	0.00E+00	0.00E+00		2.2E-10					
SR-90	3.67E-03	0		3.60E-11					
TC-99	0.00E+00	0.00E+00		1.3E-12					
U-234	1.78E-01	0.00E+00		1.6E-11					
U-235/236	1.61E-02	0.00E+00		1.6E-11					
U-238	1.78E-01	0.00E+00		2.8E-11					
CHEM	(mg/L)	(mg/L)	Kp	SF(o)	SF(i)	SF (derm)	RfD(o)	RfD(i	RfD(derm)
2-Methylnaphthalene	0.00E+00	0.00E+00	1.42E-01						
Lead	6.42E-05	0.00E+00	4.00E-06						
Tributyl phosphate	0.00E+00	0.00E+00	3.14E-02				5.00E-03		4.50E-03
U-Total	5.36E-04	0.00E+00	1.00E-03				3.00E-03		1.50E-04

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TABLE B4-0c
INACTIVE FLYASH PILE BACKGROUND
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	0.000		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.000		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.000		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.230		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.140		1.0E-10	6.9E-10	2.9E-06				
SR-90	0.000		3.6E-11	6.2E-11					
TH-228	1.120		5.5E-11	7.8E-08	5.6E-06				
TH-230	1.500		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.080		1.7E-10	1.1E-07	8.5E-06				
U-234	1.040		1.6E-11	2.6E-08	3.0E-11				
U-235/236	0.090		1.6E-11	2.5E-08	2.4E-07				
U-238	1.080		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	5.780	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Beryllium	0.600	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Dibenzo(a,h)anthracen	0.000		7.30E+00	6.10E+00					
Lead	19.200	1.00E-02							
TH-TOTAL	10.700								
2-Methylnaphthalene	0	3.00E-01							

TABLE B4-0c
INACTIVE FLYASH PILE BACKGROUND
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER										
	On-Site	FEMP Bdry								
Contaminant	onc'n (pCi/L	Conc'n (pCi/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	0.00E+00	0.00E+00		2.2E-10	2.9E-08	4.3E-07				
SR-90	3.67E-06	0.00E+00		3.6E-11	6.2E-11	0.0E+00				
TC-99	0.00E+00	0.00E+00		1.3E-12	8.3E-12	6.0E-13				
U-234	1.78E-04	0.00E+00		1.6E-11	2.6E-08	3.0E-11				
U-235/236	1.61E-05	0.00E+00		1.6E-11	2.5E-08	2.4E-07				
U-238	1.78E-04	0.00E+00		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/L)	(mg/L)	Kp					RfD(o)	RfD(i)	RfD(derm)
2-Methylnaph	0.00E+00	0.00E+00	1.42E-01							
Lead	6.42E-05	0.00E+00	4.00E-06							
Tributyl phos	0.00E+00	0.00E+00	3.14E-02					5.00E-03		4.50E-03
U-TOTAL	5.36E-04	0.00E+00	1.00E-03					3.00E-03		1.50E-04
	t*	TAO								
Tributyl phos	3.08E+01	3.67E+00								

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TABLE B4-0c
INACTIVE FLYASH PILE BACKGROUND
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT			*future*		
	On-Subunit	On-Property	Off-Prop	On-Subunit	On-Property	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3)
NP-237	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-239/240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RA-226	8.60E-06	6.89E-06	4.43E-07	0.00E+00	6.89E-06	4.43E-07
RA-228	8.00E-06	6.39E-06	4.11E-07	0.00E+00	6.39E-06	4.11E-07
SR-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-228	7.80E-06	6.28E-06	4.04E-07	0.00E+00	6.28E-06	4.04E-07
TH-230	1.10E-05	8.41E-06	5.41E-07	0.00E+00	8.41E-06	5.41E-07
TH-232	7.60E-06	6.05E-06	3.89E-07	0.00E+00	6.05E-06	3.89E-07
U-234	7.30E-06	5.83E-06	3.75E-07	0.00E+00	5.83E-06	3.75E-07
U-235/236	6.20E-07	5.04E-07	3.24E-08	0.00E+00	5.04E-07	3.24E-08
U-238	7.50E-06	6.05E-06	3.89E-07	0.00E+00	6.05E-06	3.89E-07
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3)
Arsenic	4.05E-08	4.05E-08	4.05E-08	4.05E-08	4.05E-08	4.05E-08
Beryllium	4.20E-09	4.20E-09	2.16E-10	3.60E-12	4.20E-09	2.16E-10
Dibenzo(a,h)anthra	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	1.34E-07	1.34E-07	6.92E-09	3.60E-12	1.34E-07	6.92E-09
TH-TOTAL	7.47E-08	7.47E-08	3.86E-09	0.00E+00	7.47E-08	3.86E-09
2-Methylnaphthalen	0.00E+00	0.00E+00	0.00E+00	1.08E-10	0.00E+00	0.00E+00

TABLE B4-0d
SOLID WASTE LANDFILL BACKGROUND
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
NP-237	0.00E+00		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.00E+00		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.00E+00		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.23E+00		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.14E+00		1.0E-10	6.9E-10	2.9E-06				
SR-90	0.00E+00		3.6E-11	6.2E-11	0.0E+00				
TH-228	1.12E+00		5.5E-11	7.8E-08	5.6E-06				
TH-230	1.50E+00		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.04E+00		1.7E-10	1.1E-07	8.5E-06				
U-234	1.00E+00		1.6E-11	2.6E-08	3.0E-11				
U-235/236	8.80E-02		1.6E-11	2.5E-08	2.4E-07				
U-238	1.08E+00		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Arsenic	5.78E+00	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)anthracene	0.00E+00		7.30E-01	6.10E-01					
Benzo(a)pyrene	0.00E+00		7.30E+00	6.10E+00					
Benzo(b)fluoranthene	0.00E+00		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	0.00E+00	3.00E-01							
Beryllium	6.00E-01	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	1.92E+01	1.00E-02							
Dibenzo(a,h)anthracen	0.00E+00		7.30E+00	6.10E+00					
Indeno(1,2,3-cd)pyren	0.00E+00		7.30E-01	6.10E-01					
TH-TOTAL	1.07E+01	1.00E-02							
Phenanthrene	0.00E+00	3.00E-01							

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TABLE B4-0d
SOLID WASTE LANDFILL BACKGROUND
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER										
	On-Site	FEMP Bdry								
Contaminant	onc'n (pCi/L	Conc'n (pCi/L)	Kp	SF(o)	SF(i)	SF(e)	SF (derm)			
TC-99	0.00E+00	0.00E+00		1.3E-12	8.3E-12	6.0E-13				
CHEM	(mg/L)	(mg/L)	Kp					RfD(o)	RfD(i)	RfD(derm)

SWBK_EPC.XLS; 6/8/94; 6:49 PM

FEMP-OU02-6 FINAL
January 21, 1995

TABLE B4-0d
SOLID WASTE LANDFILL BACKGROUND
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT (and Future fed ownership-off-prop)			*FUTURE; 85% veg; lim. erosion (ex. tr)*	*FUTURE; 50% veg; unlim. erosion (ex. tr; offf)*	*FUTURE; 50% veg; unlim. erosion (offf-priv)*
	On-Subunit	On-Property	Off-Prop(85% lim	On-Subunit	On-Subunit [farmer]	Off-Prop
Contaminant	Conc'n (pCi/m3	Conc'n (pCi/m3	Conc'n (pCi/m3	Conc'n (pCi/m3)	Conc'n (pCi/m3)	Conc'n (pCi/m3)
NP-237	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-239/240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RA-226	3.70E-06	0.00E+00	0.00E+00	3.70E-06	1.12E-04	1.84E-06
RA-228	3.43E-06	0.00E+00	0.00E+00	3.43E-06	1.04E-04	1.71E-06
SR-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-228	3.37E-06	0.00E+00	0.00E+00	3.37E-06	0.00E+00	1.68E-06
TH-230	4.51E-06	0.00E+00	0.00E+00	4.51E-06	1.02E-04	2.24E-06
TH-232	3.13E-06	0.00E+00	0.00E+00	3.13E-06	1.36E-04	1.56E-06
U-234	3.01E-06	0.00E+00	0.00E+00	3.01E-06	9.82E-05	1.50E-06
U-235/236	2.64E-07	0.00E+00	0.00E+00	2.64E-07	9.43E-05	1.32E-07
U-238	3.25E-06	0.00E+00	0.00E+00	3.25E-06	8.01E-06	1.62E-06
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3)	Conc'n (mg/m3)	Conc'n (mg/m3)
Arsenic	1.73E-08	0.00E+00	0.00E+00	1.73E-08	5.26E-07	8.67E-09
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	1.80E-09	0.00E+00	0.00E+00	1.80E-09	5.46E-08	9.00E-10
Lead	5.76E-08	0.00E+00	0.00E+00	5.76E-08	1.75E-06	2.88E-08
Dibenzo(a,h)anthrace	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyren	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-TOTAL	3.21E-08	0.00E+00	0.00E+00	3.21E-08	9.75E-07	1.61E-08
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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TABLE B3.4-0e
LIME SLUDGE PONDS BACKGROUND
EXPOSURE POINT CONCENTRATIONS

Surface Soil									
RAD									
Contaminant	onc'n (pCi/g)		SF(o)	SF(i)	SF(e)	SF (derm)			
CS-137	4.40E-01		2.8E-11	1.9E-11	2.0E-06				
NP-237	0.00E+00		2.2E-10	2.9E-08	4.3E-07				
PU-238	0.00E+00		2.2E-10	3.9E-08	2.8E-11				
PU-239/240	0.00E+00		2.3E-10	3.8E-08	2.7E-11				
RA-226	1.23E+00		7.8E-10	7.0E-09	6.0E-06				
RA-228	1.14E+00		1.0E-10	6.9E-10	2.9E-06				
SR-90	0.00E+00		3.6E-11	6.2E-11					
TH-228	1.12E+00		5.5E-11	7.8E-08	5.6E-06				
TH-230	1.50E+00		1.3E-11	2.9E-08	5.4E-11				
TH-232	1.08E+00		1.7E-10	1.1E-07	8.5E-06				
U-234	1.04E+00		1.6E-11	2.6E-08	3.0E-11				
U-235/236	9.00E-02		1.6E-11	2.5E-08	2.4E-07				
U-238	1.08E+00		2.8E-11	5.2E-08	3.6E-08				
CHEM	(mg/kg)	ABS	SF(o)	SF(i)	SF(e)	SF (derm)	RfD(o)	RfD(i)	RfD(derm)
Aroclor-1254	0.00E+00	6.00E-02	7.70E+00			1.03E+01			
Arsenic	5.78E+00	1.00E-03	1.75E+00	1.50E+01		1.84E+00	3.00E-04		2.85E-04
Benzo(a)pyrene	0.00E+00		7.30E+00	6.10E+00					
Benzo(a)anthracene	0.00E+00		7.30E-01	6.10E-01					
Benzo(b)fluoranthene	0.00E+00		7.30E-01	6.10E-01					
Benzo(g,h,i)perylene	0.00E+00	3.00E-01							
bis(2-Ethylhexyl)phtha	0.00E+00	4.00E-03	1.40E-02			1.40E-02	2.00E-02		2.00E-02
Beryllium	6.00E-01	1.00E-02	4.30E+00	8.40E+00			5.00E-03		5.00E-05
Lead	1.92E+01	1.00E-02							
Dibenzo(a,h)anthracen	0.00E+00		7.30E+00	6.10E+00					
Indeno(1,2,3-cd)pyren	0.00E+00		7.30E-01	6.10E-01					
Phenanthrene	0.00E+00	3.00E-01							
TH-TOTAL	1.07E+01	1.00E-02							
U-TOTAL	3.24E+00	1.00E-02					3.00E-03		1.50E-04

TABLE B3.4-0e
LIME SLUDGE PONDS BACKGROUND
EXPOSURE POINT CONCENTRATIONS

GROUNDWATER						
	Future	Future				
	On-site	Off-site				
Contaminant	onc'n (pCi/L	onc'n (pCi/L	SF(o)	SF(i)	SF(e)	SF (derm)
TC-99	0	0	1.3E-12	8.3E-12	6.0E-13	
CHEM	(mg/L)		SF(o)	SF(i)	SF(e)	SF (derm)

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TABLE B3.4-0e
LIME SLUDGE PONDS BACKGROUND
EXPOSURE POINT CONCENTRATIONS

AIR						
	CURRENT			*FUTURE; SAME AS CURRENT*		
	On-Subunit	On-Property	Off-Prop	On-Subunit	On-Property	Off-Prop
Contaminant	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m	Conc'n (pCi/m
CS-137	0.00E+00	6.60E-06	0.00E+00	0.00E+00	6.60E-06	0.00E+00
NP-237	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PU-239/240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RA-226	0.00E+00	1.84E-05	0.00E+00	0.00E+00	1.84E-05	0.00E+00
RA-228	0.00E+00	1.71E-05	0.00E+00	0.00E+00	1.71E-05	0.00E+00
SR-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-228	0.00E+00	1.68E-05	0.00E+00	0.00E+00	1.68E-05	0.00E+00
TH-230	0.00E+00	2.24E-05	0.00E+00	0.00E+00	2.24E-05	0.00E+00
TH-232	0.00E+00	1.62E-05	0.00E+00	0.00E+00	1.62E-05	0.00E+00
U-234	0.00E+00	1.55E-05	0.00E+00	0.00E+00	1.55E-05	0.00E+00
U-235/236	0.00E+00	1.32E-06	0.00E+00	0.00E+00	1.32E-06	0.00E+00
U-238	0.00E+00	1.62E-05	0.00E+00	0.00E+00	1.62E-05	0.00E+00
	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3	Conc'n (mg/m3
Aroclor-1254	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	8.70E-08	0.00E+00	0.00E+00	8.70E-08	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	0.00E+00	9.00E-09	0.00E+00	0.00E+00	9.00E-09	0.00E+00
Lead	0.00E+00	2.90E-07	0.00E+00	0.00E+00	2.90E-07	0.00E+00
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TH-TOTAL	0.00E+00	1.63E-07	0.00E+00	0.00E+00	1.63E-07	0.00E+00
U-TOTAL	0.00E+00	4.90E-08	0.00E+00	0.00E+00	4.90E-08	0.00E+00

TABLE B3.4-0e
LIME SLUDGE PONDS BACKGROUND
EXPOSURE POINT CONCENTRATIONS

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TABLE B.4-11(a)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY FARMER]

(RME VALUES) ACTIVE FLYASH PILE: SURFACE SOIL/AIR

CARCINOGENIC RISK

Radiation Risk					
	Inhalation/Soil				Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	3.11E-06	3.6E-01	1.9E-11	6.8E-12	6.8E-12
NP-237			2.9E-08		
PU-238			3.9E-08		
PU-239/240			3.8E-08		
RA-226	9.21E-06	1.1E+00	7.0E-09	7.5E-09	7.5E-09
RA-228	8.55E-06	9.9E-01	6.9E-10	6.8E-10	6.8E-10
SR-90			6.2E-11		
TH-228	8.39E-06	9.7E-01	7.8E-08	7.6E-08	7.6E-08
TH-230	1.12E-05	1.3E+00	2.9E-08	3.8E-08	3.8E-08
TH-232	8.09E-06	9.4E-01	1.1E-07	1.0E-07	1.0E-07
U-234	7.77E-06	9.0E-01	2.6E-08	2.3E-08	2.3E-08
U-235/236	6.60E-07	7.7E-02	2.5E-08	1.9E-09	1.9E-09
U-238	8.08E-06	9.4E-01	5.2E-08	4.9E-08	4.9E-08
			Total Pathway:	3.0E-07	

Chemical Risk					
	Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	4.34E-08	2.8E-09	1.5E+01	4.2E-08	4.2E-08
Beryllium	4.50E-09	2.9E-10	8.4E+00	2.4E-09	2.4E-09
Lead	1.44E-07	9.3E-09			
Thallium	4.35E-09	2.8E-10			
TH-TOTAL	8.03E-08	5.2E-09			
2-Methylnaphthalene					
Benzo(a)anthracene			6.1E-01		
Benzo(a)pyrene			6.1E+00		
Benzo(b)fluoranthene			6.1E-01		
Phenanthrene					
			Total Pathway:	4.5E-08	

Total Rad + Chem	3.4E-07	*Total:*	3.4E-07

TABLE B.4-11(a)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard				
Inhalation/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	3.11E-06	3.6E-01		
NP-237				
PU-238				
PU-239/240				
RA-226	9.21E-06	1.1E+00		
RA-228	8.55E-06	9.9E-01		
SR-90				
TH-228	8.39E-06	9.7E-01		
TH-230	1.12E-05	1.3E+00		
TH-232	8.09E-06	9.4E-01		
U-234	7.77E-06	9.0E-01		
U-235/236	6.60E-07	7.7E-02		
U-238	8.08E-06	9.4E-01		
		Total Pathway:		

Chemical Hazard				
Inhalation/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	4.34E-08	2.8E-09		
Beryllium	4.50E-09	2.9E-10		
Lead	1.44E-07	9.3E-09		
Thallium	4.35E-09	2.8E-10		
TH-TOTAL	8.03E-08	5.2E-09		
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
		Total Pathway:		

Total

Total Rad + Chem | *Total:*

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TABLE B.4-11(b)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY [SOUTH FIELD] FARMER]

(RME VALUES) ACTIVE FLYASH PILE: GROUNDWATER

CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater

Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
RA-226			7.8E-10	
SR-90	1.50E-01	7.4E+03	3.6E-11	2.6E-07
U-234	3.54E+00	1.7E+05	1.6E-11	2.8E-06
U-235/236	3.19E-01	1.6E+04	1.6E-11	2.5E-07
U-238	3.55E+00	1.7E+05	2.8E-11	4.9E-06

Total Pathway: 8.2E-06

Inhalation/Groundwater

Not applicable

Total Pathway:

Chemical Risk

Ingestion/Groundwater

Compound	Conc'n (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Lead	4.87E-13	1.3E-14		
U-Total	1.07E-02	2.9E-04		
2-Methylnaphthalen				

Total Pathway:

Inhalation/Groundwater

Compound	Intake	SF(i)	Risk
Arsenic			
Beryllium			
Lead	5.0E-14		
U-Total	1.1E-03		
2-Methylnaphthalen			

Total Pathway:

Total Rad + Chem 8.2E-06

Total Rad + Chem

TABLE B.4-11(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	
	2.6E-07
	2.8E-06
	2.5E-07
	4.9E-06

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
Arsenic		1.8E+00	
Beryllium			
Lead	1.5E-19		
U-Total	8.4E-07		
2-Methylnaphthalene			

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 8.2E-06

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TABLE B.4-11(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237					Not applicable
RA-226					
SR-90	1.5E-01	7.4E+03			
U-234	3.5E+00	1.7E+05			
U-235/236	3.2E-01	1.6E+04			
U-238	3.6E+00	1.7E+05			
			Total Pathway:		Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
Arsenic			3.0E-04		Arsenic			
Beryllium			5.0E-03		Beryllium			
Lead	4.9E-13	1.3E-14			Lead	5.0E-14		
U-Total	1.1E-02	2.9E-04	3.0E-03	9.8E-02	U-Total	1.1E-03		
2-Methylnaphthale					2-Methylnaphthalen			
			Total Pathway:	9.8E-02			Total Pathway:	
			Total Rad + Chem	9.8E-02			Total Rad + Chem	

TABLE B.4-11(b)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	

Total Pathway:

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
Arsenic		2.9E-04		
Beryllium		5.0E-05		
Lead	1.5E-19			
U-Total	8.4E-07	1.5E-04	5.6E-03	1.0E-01
2-Methylnaphthalen				
		Total Pathway:	5.6E-03	

Total Rad + Chem 5.6E-03 *Total:* 1.0E-01

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TABLE B.4-11(c)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY [SOUTH FIELD] FARMER (RME VALUES)]

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137	2.14E-06	4.2E+00	2.8E-11	1.2E-10
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	4.64E-06	9.1E+00	7.8E-10	7.1E-09
RA-228	4.20E-06	8.3E+00	1.0E-10	8.3E-10
SR-90			3.6E-11	
TH-228	4.10E-06	8.1E+00	5.5E-11	4.4E-10
TH-230	5.60E-06	1.1E+01	1.3E-11	1.4E-10
TH-232	4.04E-06	8.0E+00	1.7E-10	1.4E-09
U-234	3.81E-06	7.5E+00	1.6E-11	1.2E-10
U-235/236	3.23E-07	6.4E-01	1.6E-11	1.0E-11
U-238	3.96E-06	7.8E+00	2.8E-11	2.2E-10
			Total Pathway:	1.0E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137	2.14E-06	2.2E+00	2.8E-11	6.3E-11
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	4.64E-06	4.8E+00	7.8E-10	3.8E-09
RA-228	4.16E-06	4.3E+00	1.0E-10	4.3E-10
SR-90			3.6E-11	
TH-228	3.98E-06	4.2E+00	5.5E-11	2.3E-10
TH-230	5.60E-06	5.8E+00	1.3E-11	7.6E-11
TH-232	4.04E-06	4.2E+00	1.7E-10	7.2E-10
U-234	3.81E-06	4.0E+00	1.6E-11	6.4E-11
U-235/236	3.23E-07	3.4E-01	1.6E-11	5.4E-12
U-238	3.96E-06	4.1E+00	2.8E-11	1.2E-10
			Total Pathway:	5.5E-09

Total
1.8E-10
1.1E-08
1.3E-09
6.7E-10
2.2E-10
2.1E-09
1.8E-10
1.6E-11
3.3E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.62E-05	2.9E-08	1.8E+00	5.0E-08
Beryllium	2.36E-06	2.6E-09	4.3E+00	1.1E-08
Lead	7.51E-05	8.3E-08		
Thallium	2.30E-06	2.5E-09		
TH-TOTAL	4.01E-05	4.4E-08		
2-Methylnaphthalen				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Phenanthrene				
			Total Pathway:	6.2E-08
			Total Rad + Chem	7.2E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.62E-05	1.5E-08	1.8E+00	2.7E-08
Beryllium	2.36E-06	1.4E-09	4.3E+00	5.9E-09
Lead	7.51E-05	4.4E-08		
Thallium	2.30E-06	1.3E-09		
TH-TOTAL	4.01E-05	2.3E-08		
2-Methylnaphthalene				
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Phenanthrene				
			Total Pathway:	3.3E-08
			Total Rad + Chem	3.8E-08

Total	
7.7E-08	
1.7E-08	
Total:	1.1E-07

TABLE B.4-11(c)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	2.1E-06	4.2E+00			CS-137	2.14E-06	2.2E+00			
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	4.6E-06	9.1E+00			RA-226	4.64E-06	4.8E+00			
RA-228	4.2E-06	8.3E+00			RA-228	4.16E-06	4.3E+00			
SR-90					SR-90					
TH-228	4.1E-06	8.1E+00			TH-228	3.98E-06	4.2E+00			
TH-230	5.6E-06	1.1E+01			TH-230	5.60E-06	5.8E+00			
TH-232	4.0E-06	8.0E+00			TH-232	4.04E-06	4.2E+00			
U-234	3.8E-06	7.5E+00			U-234	3.81E-06	4.0E+00			
U-235/236	3.2E-07	6.4E-01			U-235/236	3.23E-07	3.4E-01			
U-238	4.0E-06	7.8E+00			U-238	3.96E-06	4.1E+00			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	2.6E-05	2.9E-08	3.0E-04	9.6E-05	Arsenic	2.62E-05	1.5E-08	3.0E-04	5.1E-05	1.5E-04
Beryllium	2.4E-06	2.6E-09	5.0E-03	5.2E-07	Beryllium	2.36E-06	1.4E-09	5.0E-03	2.8E-07	8.0E-07
Lead	7.5E-05	8.3E-08			Lead	7.51E-05	4.4E-08			
Thallium	2.3E-06	2.5E-09	7.0E-05	3.6E-05	Thallium	2.30E-06	1.3E-09	7.0E-05	1.9E-05	5.5E-05
TH-TOTAL	4.0E-05	4.4E-08			TH-TOTAL	4.01E-05	2.3E-08			
2-Methylnaphthalene					2-Methylnaphthalene					
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Phenanthrene					Phenanthrene					
		Total Pathway:		1.3E-04			Total Pathway:		7.0E-05	
		Total Rad + Chem		1.3E-04			Total Rad + Chem		7.0E-05	*Total:* 2.0E-04

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TABLE B.4-11(c)

(continued)

ACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			1.8E-10
NP-237			2.2E-10		NP-237			2.2E-10			
PU-238			2.2E-10		PU-238			2.2E-10			
PU-239/240			2.3E-10		PU-239/240			2.3E-10			
RA-226			7.8E-10		RA-226			7.8E-10			1.1E-08
RA-228			1.0E-10		RA-228			1.0E-10			1.3E-09
SR-90	8.46E-04	1.7E+03	3.6E-11	6.0E-08	SR-90	8.44E-04	8.8E+02	3.6E-11	3.2E-08	9.2E-08	9.2E-08
TH-228			5.5E-11		TH-228			5.5E-11			6.7E-10
TH-230			1.3E-11		TH-230			1.3E-11			2.2E-10
TH-232			1.7E-10		TH-232			1.7E-10			2.1E-09
U-234	1.73E-02	3.4E+04	1.6E-11	5.5E-07	U-234	1.73E-02	1.8E+04	1.6E-11	2.9E-07	8.4E-07	8.4E-07
U-235/236	1.56E-03	3.1E+03	1.6E-11	4.9E-08	U-235/236	1.56E-03	1.6E+03	1.6E-11	2.6E-08	7.5E-08	7.5E-08
U-238	1.74E-02	3.4E+04	2.8E-11	9.6E-07	U-238	1.74E-02	1.8E+04	2.8E-11	5.1E-07	1.5E-06	1.5E-06
			Total Pathway:	1.6E-06				Total Pathway:	8.6E-07		

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk		
Arsenic			1.8E+00		Arsenic			1.8E+00			7.7E-08
Beryllium			4.3E+00		Beryllium			4.3E+00			1.7E-08
Lead	2.58E-12	2.8E-15			Lead	2.58E-12	1.5E-15				
Thallium					Thallium						
TH-TOTAL					TH-TOTAL						
2-Methylnaphthalene					2-Methylnaphthalene						
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			
Benzo(b)fluoranthen			7.3E-01		Benzo(b)fluoranthene			7.3E-01			
Phenanthrene					Phenanthrene						
U-Total	5.24E-02	5.8E-05			U-Total	5.24E-02	3.1E-05				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	1.6E-06				Total Rad + Chem	8.6E-07	*Total:* 2.5E-06	2.6E-06

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TABLE B.4-11(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	8.5E-04	1.7E+03		
TH-228				
TH-230				
TH-232				
U-234	1.7E-02	3.4E+04		
U-235/236	1.6E-03	3.1E+03		
U-238	1.7E-02	3.4E+04		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	8.44E-04	8.8E+02		
TH-228				
TH-230				
TH-232				
U-234	1.73E-02	1.8E+04		
U-235/236	1.56E-03	1.6E+03		
U-238	1.74E-02	1.8E+04		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Lead	2.6E-12	2.8E-15		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	5.2E-02	5.8E-05	3.0E-03	1.9E-02

Total Pathway: 1.9E-02

Total Rad + Chem 1.9E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Lead	2.58E-12	1.5E-15		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	5.24E-02	3.1E-05	3.0E-03	1.0E-02

Total Pathway: 1.0E-02

Total Rad + Chem 1.0E-02

	Total	Total Dust & Groundwater Affected
		1.5E-04
		8.0E-07
		5.5E-05
	2.9E-02	2.9E-02
Total:	2.9E-02	3.0E-02

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TABLE B.4-11(d)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY [SOUTH FIELD] FARMER (RME VALUES)]

ACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	7.01E-03	1.3E+01	2.8E-11	3.6E-10	CS-137	2.46E-03	1.8E+01	2.8E-11	5.1E-10	8.7E-10
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	1.64E-04	3.0E-01	7.8E-10	2.4E-10	RA-226	2.96E-04	2.2E+00	7.8E-10	1.7E-09	1.9E-09
RA-228	9.68E-05	1.8E-01	1.0E-10	1.8E-11	RA-228	1.75E-04	1.3E+00	1.0E-10	1.3E-10	1.5E-10
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	2.04E-06	3.8E-03	5.5E-11	2.1E-13	TH-228	1.74E-06	1.3E-02	5.5E-11	7.0E-13	9.1E-13
TH-230	1.35E-05	2.5E-02	1.3E-11	3.2E-13	TH-230	1.13E-05	8.3E-02	1.3E-11	1.1E-12	1.4E-12
TH-232	9.80E-06	1.8E-02	1.7E-10	3.1E-12	TH-232	8.16E-06	6.0E-02	1.7E-10	1.0E-11	1.3E-11
U-234	6.71E-05	1.2E-01	1.6E-11	2.0E-12	U-234	2.01E-04	1.5E+00	1.6E-11	2.4E-11	2.6E-11
U-235/236	5.70E-06	1.0E-02	1.6E-11	1.7E-13	U-235/236	1.71E-05	1.3E-01	1.6E-11	2.0E-12	2.2E-12
U-238	6.98E-05	1.3E-01	2.8E-11	3.6E-12	U-238	2.09E-04	1.5E+00	2.8E-11	4.3E-11	4.7E-11
			Total Pathway:	6.2E-10				Total Pathway:	2.4E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.33E-05	1.4E-08	1.75E+00	2.4E-08	Arsenic	3.99E-07	1.6E-09	1.75E+00	2.9E-09	2.7E-08
Beryllium	4.41E-07	4.5E-10	4.30E+00	1.9E-09	Beryllium	3.97E-10	1.6E-12	4.30E+00	7.0E-12	2.0E-09
Lead	2.85E-06	2.9E-09			Lead	2.38E-06	9.8E-09			
Thallium	3.49E-05	3.6E-08			Thallium	1.75E-06	7.2E-09			
TH-TOTAL	9.72E-08	1.0E-10			TH-TOTAL	8.10E-08	3.3E-10			
2-Methylnaphthalene					2-Methylnaphthalene					
Benzo(a)anthracene			7.30E-01		Benzo(a)anthracene			7.30E-01		
Benzo(a)pyrene			7.30E+00		Benzo(a)pyrene			7.30E+00		
Benzo(b)fluoranthen			7.30E-01		Benzo(b)fluoranthen			7.30E-01		
Phenanthrene					Phenanthrene					
			Total Pathway:	2.6E-08				Total Pathway:	2.9E-09	
			Total Rad + Chem	2.7E-08				Total Rad + Chem	5.3E-09	*Total:* 3.2E-08

TABLE B.4-11(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137	7.0E-03	1.3E+01		
NP-237				
PU-238				
PU-239/240				
RA-226	1.6E-04	3.0E-01		
RA-228	9.7E-05	1.8E-01		
SR-90				
TH-228	2.0E-06	3.8E-03		
TH-230	1.4E-05	2.5E-02		
TH-232	9.8E-06	1.8E-02		
U-234	6.7E-05	1.2E-01		
U-235/236	5.7E-06	1.0E-02		
U-238	7.0E-05	1.3E-01		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137	2.46E-03	1.8E+01		
NP-237				
PU-238				
PU-239/240				
RA-226	2.96E-04	2.2E+00		
RA-228	1.75E-04	1.3E+00		
SR-90				
TH-228	1.74E-06	1.3E-02		
TH-230	1.13E-05	8.3E-02		
TH-232	8.16E-06	6.0E-02		
U-234	2.01E-04	1.5E+00		
U-235/236	1.71E-05	1.3E-01		
U-238	2.09E-04	1.5E+00		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.3E-05	1.4E-08	3.0E-04	4.6E-05
Beryllium	4.4E-07	4.5E-10	5.0E-03	9.1E-08
Lead	2.9E-06	2.9E-09		
Thallium	3.5E-05	3.6E-08	7.0E-05	5.1E-04
TH-TOTAL	9.7E-08	1.0E-10		
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthen				
Phenanthrene				

Total Pathway: 5.6E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	3.99E-07	1.6E-09	3.0E-04	5.5E-06
Beryllium	3.97E-10	1.6E-12	5.0E-03	3.3E-10
Lead	2.38E-06	9.8E-09		
Thallium	1.75E-06	7.2E-09	7.0E-05	1.0E-04
TH-TOTAL	8.10E-08	3.3E-10		
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthen				
Phenanthrene				

Total Pathway: 1.1E-04

		Total
		5.1E-05
		9.1E-08
		6.2E-04

Total Rad + Chem 5.6E-04

Total Rad + Chem 1.1E-04 *Total:* 6.7E-04

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TABLE B.4-11(d) (continued)

ACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			8.7E-10
NP-237			2.2E-10		NP-237			2.2E-10			
PU-238			2.2E-10		PU-238			2.2E-10			
PU-239/240			2.3E-10		PU-239/240			2.3E-10			
RA-226			7.8E-10		RA-226			7.8E-10			1.9E-09
RA-228			1.0E-10		RA-228			1.0E-10			1.5E-10
SR-90	3.24E-02	6.0E+01	3.6E-11	2.1E-09	SR-90	1.65E-01	1.2E+03	3.6E-11	4.4E-08	4.6E-08	4.6E-08
TH-228			5.5E-11		TH-228			5.5E-11			9.1E-13
TH-230			1.3E-11		TH-230			1.3E-11			1.4E-12
TH-232			1.7E-10		TH-232			1.7E-10			1.3E-11
U-234	2.07E-01	3.8E+02	1.6E-11	6.1E-09	U-234	6.41E-01	4.7E+03	1.6E-11	7.5E-08	8.1E-08	8.1E-08
U-235/236	1.86E-02	3.4E+01	1.6E-11	5.5E-10	U-235/236	5.78E-02	4.2E+02	1.6E-11	6.8E-09	7.3E-09	7.3E-09
U-238	2.07E-01	3.8E+02	2.8E-11	1.1E-08	U-238	6.43E-01	4.7E+03	2.8E-11	1.3E-07	1.4E-07	1.4E-07
			Total Pathway:	1.9E-08				Total Pathway:	2.6E-07		

Chemical Risk

Ingestion/Beef					Ingestion/Milk				
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.75E+00		Arsenic			1.75E+00	
Beryllium			4.30E+00		Beryllium			4.30E+00	
Lead	5.98E-14	6.1E-17			Lead	5.10E-14	2.1E-16		
Thallium					Thallium				
TH-TOTAL					TH-TOTAL				
2-Methylnaphthalene					2-Methylnaphthalene				
Benzo(a)anthracene			7.30E-01		Benzo(a)anthracene			7.30E-01	
Benzo(a)pyrene			7.30E+00		Benzo(a)pyrene			7.30E+00	
Benzo(b)fluoranthene			7.30E-01		Benzo(b)fluoranthene			7.30E-01	
Phenanthrene					Phenanthrene				
U-Total	6.24E-04	6.4E-07			U-Total	1.94E-03	8.0E-06		
			Total Pathway:					Total Pathway:	

Total Rad + Chem	1.9E-08	Total Rad + Chem	2.6E-07	*Total:* 2.8E-07 3.1E-07

TABLE B.4-11(d) (continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	3.2E-02	6.0E+01		
TH-228				
TH-230				
TH-232				
U-234	2.1E-01	3.8E+02		
U-235/236	1.9E-02	3.4E+01		
U-238	2.1E-01	3.8E+02		
			Total Pathway:	

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	1.65E-01	1.2E+03		
TH-228				
TH-230				
TH-232				
U-234	6.41E-01	4.7E+03		
U-235/236	5.78E-02	4.2E+02		
U-238	6.43E-01	4.7E+03		
			Total Pathway:	

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Lead	6.0E-14	6.1E-17		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	6.2E-04	6.4E-07	3.0E-03	2.1E-04
			Total Pathway:	2.1E-04

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Lead	5.10E-14	2.1E-16		
Thallium			7.0E-05	
TH-TOTAL				
2-Methylnaphthalene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Phenanthrene				
U-Total	1.94E-03	8.0E-06	3.0E-03	2.7E-03
			Total Pathway:	2.7E-03

Total Rad + Chem 2.1E-04

Total Rad + Chem 2.7E-03

	Total	Total Dust & Groundwater Affected
		5.1E-05
		9.1E-08
		6.2E-04
	2.9E-03	2.9E-03
Total:	2.9E-03	3.5E-03

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TABLE B.4-13(a)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY RESIDENT FARMER (RME VALUES)]
SOUTH FIELD: SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk
CS-137	7.0E-05	8.1E+00	1.9E-11	1.5E-10
NP-237			2.9E-08	
PU-238			3.9E-08	
PU-239/240			3.8E-08	
RA-226	4.4E-04	5.1E+01	7.0E-09	3.6E-07
RA-228	4.1E-04	4.7E+01	6.9E-10	3.2E-08
SR-90			6.2E-11	
TC-99			8.3E-12	
TH-228	4.0E-04	4.6E+01	7.8E-08	3.6E-06
TH-230	5.4E-04	6.2E+01	2.9E-08	1.8E-06
TH-232	3.8E-04	4.5E+01	1.1E-07	4.9E-06
U-234	3.7E-04	4.3E+01	2.6E-08	1.1E-06
U-235/236	3.2E-05	3.7E+00	2.5E-08	9.2E-08
U-238	3.9E-04	4.5E+01	5.2E-08	2.3E-06
			Total Pathway:	1.4E-05

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
CS-137	0.44	1.9E+03	2.8E-11	5.4E-08
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	1.23	5.4E+03	7.8E-10	4.2E-06
RA-228	1.14	5.0E+03	1.0E-10	5.0E-07
SR-90			3.6E-11	
TC-99			1.3E-12	
TH-228	1.12	4.9E+03	5.5E-11	2.7E-07
TH-230	1.50	6.6E+03	1.3E-11	8.6E-08
TH-232	1.08	4.8E+03	1.7E-10	8.1E-07
U-234	1.04	4.6E+03	1.6E-11	7.3E-08
U-235/236	0.09	3.9E+02	1.6E-11	6.2E-09
U-238	1.08	4.8E+03	2.8E-11	1.3E-07
			Total Pathway:	6.2E-06

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk
Aroclor-1254				
Aroclor-1260				
Arsenic	2.37E-06	1.5E-07	1.5E+01	2.3E-06
Benzo(a)anthracene			6.1E-01	
Benzo(a)pyrene			6.1E+00	
Benzo(b)fluoranthene			6.1E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			6.1E-02	
Beryllium	2.46E-07	1.6E-08	8.4E+00	1.3E-07
Lead	7.87E-06	5.1E-07		
Dibenzo(a,h)anthracene			6.1E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			6.1E-01	
Phenanthrene				
TH-Total	4.39E-06	2.8E-07		
			Total Pathway:	2.4E-06
			Total Rad + Chem	1.7E-05

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic	5.78	1.4E-05	1.8E+00	2.5E-05
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium	0.60	1.5E-06	4.3E+00	6.4E-06
Lead	19.20	4.7E-05		
Dibenzo(a,h)anthracene			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyrene			7.3E-01	
Phenanthrene				
TH-Total	10.70	2.6E-05		
			Total Pathway:	3.1E-05
			Total Rad + Chem	3.7E-05

TABLE B.4-13(a)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil				External Radiation/Soil				Total
				Compound	Intake	SF(e)	Risk	
Not applicable				CS-137	1.8E+01	2.0E-06	3.7E-05	3.7E-05
				NP-237		4.3E-07		
				PU-238		2.8E-11		
				PU-239/24		2.7E-11		
				RA-226	5.1E+01	6.0E-06	3.1E-04	3.1E-04
				RA-228	4.7E+01	2.9E-06	1.4E-04	1.4E-04
				SR-90				
				TC-99		6.0E-13		
				TH-228	4.7E+01	5.6E-06	2.6E-04	2.6E-04
				TH-230	6.2E+01	5.4E-11	3.4E-09	1.9E-06
				TH-232	4.5E+01	8.5E-06	3.8E-04	3.9E-04
				U-234	4.3E+01	3.0E-11	1.3E-09	1.2E-06
				U-235/236	3.7E+00	2.4E-07	8.8E-07	9.8E-07
				U-238	4.5E+01	3.6E-08	1.6E-06	4.1E-06
Total Pathway:				Total Pathway:			1.1E-03	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Aroclor-1254		1.0E+01						
Aroclor-1260		1.0E+01						
Arsenic	4.6E-07	1.8E+00	8.4E-07					2.8E-05
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Benzo(k)fluoranthene								
Beryllium	4.7E-07		6.4E-06					1.3E-05
Lead	1.5E-05			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin		1.6E+01						
Indeno(1,2,3-cd)pyrene								
Phenanthrene								
TH-Total	8.4E-06							
Total Pathway:			7.2E-06	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 7.2E-06 1.1E-03 *Total:* 1.2E-03

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TABLE B.4-13(a)
(continued)

Non-carcinogenic Risk

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	7.03E-05	8.1E+00		
NP-237				
PU-238				
PU-239/240				
RA-226	4.39E-04	5.1E+01		
RA-228	4.05E-04	4.7E+01		
SR-90				
TC-99				
TH-228	3.99E-04	4.6E+01		
TH-230	5.36E-04	6.2E+01		
TH-232	3.84E-04	4.5E+01		
U-234	3.71E-04	4.3E+01		
U-235/236	3.18E-05	3.7E+00		
U-238	3.85E-04	4.5E+01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
CS-137	0.44	1.9E+03		
NP-237				
PU-238				
PU-239/240				
RA-226	1.23	5.4E+03		
RA-228	1.14	5.0E+03		
SR-90				
TC-99				
TH-228	1.12	4.9E+03		
TH-230	1.50	6.6E+03		
TH-232	1.08	4.8E+03		
U-234	1.04	4.6E+03		
U-235/236	0.09	3.9E+02		
U-238	1.08	4.8E+03		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic	2.37E-06	1.5E-07		
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium	2.46E-07	1.6E-08		
Lead	7.87E-06	5.1E-07		
Dibenzo(a,h)anthracene				
Dieldrin				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total	4.39E-06	2.8E-07		

Total Pathway:

Total Rad + Chem

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic	5.78	1.4E-05	3.0E-04	4.8E-02
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium	0.60	1.5E-06	5.0E-03	3.0E-04
Lead	19.20	4.7E-05		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total	10.70	2.6E-05		

Total Pathway: 4.8E-02

Total Rad + Chem 4.8E-02

TABLE B.4-13(a)
(continued)

Non-carcinogenic Risk

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	CS-137	1.8E+01		
	NP-237			
	PU-238			
	PU-239/240			
	RA-226	5.1E+01		
	RA-228	4.7E+01		
	SR-90			
	TC-99			
	TH-228	4.7E+01		
	TH-230	6.2E+01		
	TH-232	4.5E+01		
	U-234	4.3E+01		
	U-235/236	3.7E+00		
	U-238	4.5E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(o)	Hazard	
Aroclor-1254								
Aroclor-1260								
Arsenic	4.6E-07	2.9E-04	1.6E-03					4.9E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Benzo(k)fluoranthene								
Beryllium	4.7E-07	5.0E-05	9.5E-03					9.7E-03
Lead	1.5E-05			Not applicable				
Dibenzo(a,h)anthracene								
Dieldrin		5.0E-05						
Indeno(1,2,3-cd)pyrene								
Phenanthrene								
TH-Total	8.4E-06							
		Total Pathway:	1.1E-02			Total Pathway:		

Total Rad + Chem 1.1E-02

otal: 5.9E-02

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TABLE B.4-13(b)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]
SOUTH FIELD: GROUNDWATER
CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237			2.2E-10		
SR-90	3.7E-03	1.8E+02	3.6E-11	6.5E-09	Not applicable
TC-99			1.3E-12		
U-234	1.8E-01	8.7E+03	1.6E-11	1.4E-07	
U-235/236	1.6E-02	7.9E+02	1.6E-11	1.3E-08	
U-238	1.8E-01	8.7E+03	2.8E-11	2.4E-07	
			Total Pathway:	4.0E-07	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
2-Methylnaphthalene					2-Methylnaphthalene			
Lead	6.4E-05	1.8E-06			Lead	6.6E-06		
Tributyl phosphate					Tributyl phosphate			
U-Total	5.4E-04	1.5E-05			U-Total	5.5E-05		
			Total Pathway:				Total Pathway:	
			Total Rad + Chem	4.0E-07			Total Rad + Chem	

TABLE B.4-13(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	6.5E-09
	1.4E-07
	1.3E-08
	2.4E-07

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene			
Lead	2.0E-11		
Tributyl phosphate			
U-Total	4.2E-08		

Total Pathway:

For PAHs and Be dermal carcinogenic risk assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 4.0E-07

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TABLE B.4-13(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard	
NP-237					
SR-90	3.7E-03	1.8E+02			Not applicable
TC-99					
U-234	1.8E-01	8.7E+03			
U-235/236	1.6E-02	7.9E+02			
U-238	1.8E-01	8.7E+03			
		Total Pathway:			Total Pathway:

Chemical Hazard

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard	Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene					2-Methylnaphthalene			
Lead	6.4E-05	1.8E-06			Lead	6.6E-06		
Tributyl phosphate			5.0E-03		Tributyl phosphate			
U-Total	5.4E-04	1.5E-05	3.0E-03	4.9E-03	U-Total	5.5E-05		
			Total Pathway:	4.9E-03			Total Pathway:	
			Total Rad + Chem	4.9E-03			Total Rad + Chem	

TABLE B.4-13(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene				
Lead	2.0E-11			
Tributyl phosphate		4.5E-03		
U-Total	4.2E-08	1.5E-04	2.8E-04	5.2E-03
Total Pathway:			2.8E-04	

Total Rad + Chem	2.8E-04	*Total:*	5.2E-03

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TABLE B.4-13(c)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]

SOUTH FIELD: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	5.65E-03	1.1E+04	2.8E-11	3.1E-07	CS-137	5.64E-03	5.9E+03	2.8E-11	1.6E-07	4.8E-07
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	7.90E-04	1.6E+03	7.8E-10	1.2E-06	RA-226	7.90E-04	8.2E+02	7.8E-10	6.4E-07	1.9E-06
RA-228	7.32E-04	1.4E+03	1.0E-10	1.4E-07	RA-228	7.25E-04	7.6E+02	1.0E-10	7.6E-08	2.2E-07
SR-90			3.6E-11		SR-90			3.6E-11		
TC-99			1.3E-12		TC-99			1.3E-12		
TH-228	4.07E-05	8.0E+01	5.5E-11	4.4E-09	TH-228	3.96E-05	4.1E+01	5.5E-11	2.3E-09	6.7E-09
TH-230	5.46E-05	1.1E+02	1.3E-11	1.4E-09	TH-230	5.46E-05	5.7E+01	1.3E-11	7.4E-10	2.1E-09
TH-232	3.93E-05	7.7E+01	1.7E-10	1.3E-08	TH-232	3.93E-05	4.1E+01	1.7E-10	7.0E-09	2.0E-08
U-234	1.78E-03	3.5E+03	1.6E-11	5.6E-08	U-234	1.78E-03	1.9E+03	1.6E-11	3.0E-08	8.6E-08
U-235/236	1.51E-04	3.0E+02	1.6E-11	4.7E-09	U-235/236	1.51E-04	1.6E+02	1.6E-11	2.5E-09	7.3E-09
U-238	1.85E-03	3.6E+03	2.8E-11	1.0E-07	U-238	1.85E-03	1.9E+03	2.8E-11	5.4E-08	1.6E-07
		Total Pathway:		1.9E-06				Total Pathway:	9.8E-07	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00		
Arsenic	1.48E-02	1.6E-05	1.8E+00	2.9E-05	Arsenic	1.48E-02	8.7E-06	1.8E+00	1.5E-05	4.4E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02		
Beryllium	3.85E-04	4.2E-07	4.3E+00	1.8E-06	Beryllium	3.85E-04	2.2E-07	4.3E+00	9.7E-07	2.8E-06
Lead	5.01E-02	5.5E-05			Lead	5.01E-02	2.9E-05			
Dibenzo(a,h)anthracen			7.3E+00		Dibenzo(a,h)anthracen			7.3E+00		
Dieldrin			1.6E+01		Dieldrin			1.6E+01		
Indeno(1,2,3-cd)pyren			7.3E-01		Indeno(1,2,3-cd)pyren			7.3E-01		
Phenanthrene					Phenanthrene					
TH-Total	3.89E-04	4.3E-07			TH-Total	3.89E-04	2.3E-07			
		Total Pathway:		3.0E-05				Total Pathway:	1.6E-05	
		Total Rad + Chem		3.2E-05				Total Rad + Chem	1.7E-05	*Total:* 4.9E-05

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TABLE B.4-13(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	5.6E-03	1.1E+04			CS-137	5.64E-03	5.9E+03			
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	7.9E-04	1.6E+03			RA-226	7.90E-04	8.2E+02			
RA-228	7.3E-04	1.4E+03			RA-228	7.25E-04	7.6E+02			
SR-90					SR-90					
TC-99					TC-99					
TH-228	4.1E-05	8.0E+01			TH-228	3.96E-05	4.1E+01			
TH-230	5.5E-05	1.1E+02			TH-230	5.46E-05	5.7E+01			
TH-232	3.9E-05	7.7E+01			TH-232	3.93E-05	4.1E+01			
U-234	1.8E-03	3.5E+03			U-234	1.78E-03	1.9E+03			
U-235/236	1.5E-04	3.0E+02			U-235/236	1.51E-04	1.6E+02			
U-238	1.8E-03	3.6E+03			U-238	1.85E-03	1.9E+03			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254					Aroclor-1254					
Aroclor-1260					Aroclor-1260					
Arsenic	1.5E-02	1.6E-05	3.0E-04	5.4E-02	Arsenic	1.48E-02	8.7E-06	3.0E-04	2.9E-02	8.3E-02
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Benzo(k)fluoranthene					Benzo(k)fluoranthene					
Beryllium	3.9E-04	4.2E-07	5.0E-03	8.5E-05	Beryllium	3.85E-04	2.2E-07	5.0E-03	4.5E-05	1.3E-04
Lead	5.0E-02	5.5E-05			Lead	5.01E-02	2.9E-05			
Dibenzo(a,h)anthracen					Dibenzo(a,h)anthracen					
Dieldrin			5.0E-05		Dieldrin			5.0E-05		
Indeno(1,2,3-cd)pyren					Indeno(1,2,3-cd)pyren					
Phenanthrene					Phenanthrene					
TH-Total	3.9E-04	4.3E-07			TH-Total	3.89E-04	2.3E-07			
			Total Pathway:	5.5E-02				Total Pathway:	2.9E-02	
			Total Rad + Chem	5.5E-02				Total Rad + Chem	2.9E-02	*Total:* 8.3E-02

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TABLE B.4-13(c)

(continued)

SOUTH FIELD: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.07E-05	4.1E+01	3.6E-11	1.5E-09
TC-99			1.3E-12	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.72E-04	1.7E+03	1.6E-11	2.7E-08
U-235/236	7.89E-05	1.6E+02	1.6E-11	2.5E-09
U-238	8.72E-04	1.7E+03	2.8E-11	4.8E-08
			Total Pathway:	8.0E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
CS-137			2.8E-11	
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	2.06E-05	2.2E+01	3.6E-11	7.8E-10
TC-99			1.3E-12	
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.72E-04	9.1E+02	1.6E-11	1.5E-08
U-235/236	7.89E-05	8.2E+01	1.6E-11	1.3E-09
U-238	8.72E-04	9.1E+02	2.8E-11	2.5E-08
			Total Pathway:	4.2E-08

Total	Total Dust & Groundwater Affected
	4.8E-07
	1.9E-06
	2.2E-07
2.2E-09	2.2E-09
	6.7E-09
	2.1E-09
	2.0E-08
4.2E-08	1.3E-07
3.8E-09	1.1E-08
7.4E-08	2.3E-07

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthen			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthen			7.3E-02	
Beryllium			4.3E+00	
Lead	3.32E-04	3.7E-07		
Dibenzo(a,h)anthrac			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyr			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	2.62E-03	2.9E-06		
			Total Pathway:	

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Aroclor-1254			7.7E+00	
Aroclor-1260			7.7E+00	
Arsenic			1.8E+00	
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene			7.3E-02	
Beryllium			4.3E+00	
Lead	3.32E-04	1.9E-07		
Dibenzo(a,h)anthracen			7.3E+00	
Dieldrin			1.6E+01	
Indeno(1,2,3-cd)pyren			7.3E-01	
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate				
U-Total	2.62E-03	1.5E-06		
			Total Pathway:	

Total	Total Dust & Groundwater Affected
	4.4E-05
	2.8E-06

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Total Rad + Chem 8.0E-08

Total Rad + Chem 4.2E-08

Total: 1.2E-07 5.0E-05

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TABLE B.4-13(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total	Total Dust & Groundwater Affected
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard		
CS-137					CS-137						
NP-237					NP-237						
PU-238					PU-238						
PU-239/240					PU-239/240						
RA-226					RA-226						
RA-228					RA-228						
SR-90	2.1E-05	4.1E+01			SR-90	2.06E-05	2.2E+01				
TC-99					TC-99						
TH-228					TH-228						
TH-230					TH-230						
TH-232					TH-232						
U-234	8.7E-04	1.7E+03			U-234	8.72E-04	9.1E+02				
U-235/236	7.9E-05	1.6E+02			U-235/236	7.89E-05	8.2E+01				
U-238	8.7E-04	1.7E+03			U-238	8.72E-04	9.1E+02				
		Total Pathway:					Total Pathway:				

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit						
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard		
Aroclor-1254					Aroclor-1254						
Aroclor-1260					Aroclor-1260						
Arsenic			3.0E-04		Arsenic			3.0E-04			8.3E-02
Benzo(a)anthracene					Benzo(a)anthracene						
Benzo(a)pyrene					Benzo(a)pyrene						
Benzo(b)fluoranthene					Benzo(b)fluoranthene						
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene					Benzo(k)fluoranthene						
Beryllium			5.0E-03		Beryllium			5.0E-03			1.3E-04
Lead	3.3E-04	3.7E-07			Lead	3.32E-04	1.9E-07				
Dibenzo(a,h)anthracen					Dibenzo(a,h)anthracen						
Dieldrin			5.0E-05		Dieldrin			5.0E-05			
Indeno(1,2,3-cd)pyren					Indeno(1,2,3-cd)pyren						
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate			5.0E-03		Tributyl phosphate			5.0E-03			
U-Total	2.6E-03	2.9E-06	3.0E-03	9.6E-04	U-Total	2.62E-03	1.5E-06	3.0E-03	5.1E-04	1.5E-03	1.5E-03
		Total Pathway:		9.6E-04			Total Pathway:		5.1E-04		
		Total Rad + Chem		9.6E-04			Total Rad + Chem		5.1E-04	*Total:* 1.5E-03	8.5E-02

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TABLE B.4-13(d)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY FARMER (RME VALUES)]
SOUTH FIELD: BEEF AND MILK (DUST AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	3.95E+01	7.2E+04	2.8E-11	2.0E-06	CS-137	1.38E+01	1.0E+05	2.8E-11	2.8E-06	4.9E-06
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	3.84E-01	7.1E+02	7.8E-10	5.5E-07	RA-226	6.92E-01	5.1E+03	7.8E-10	4.0E-06	4.5E-06
RA-228	3.51E-01	6.4E+02	1.0E-10	6.4E-08	RA-228	6.35E-01	4.7E+03	1.0E-10	4.7E-07	5.3E-07
SR-90			3.6E-11		SR-90			3.6E-11		
TC-99			1.3E-12		TC-99			1.3E-12		
TH-228	3.56E-03	6.5E+00	5.5E-11	3.6E-10	TH-228	3.02E-03	2.2E+01	5.5E-11	1.2E-09	1.6E-09
TH-230	4.88E-03	9.0E+00	1.3E-11	1.2E-10	TH-230	4.07E-03	3.0E+01	1.3E-11	3.9E-10	5.1E-10
TH-232	3.52E-03	6.5E+00	1.7E-10	1.1E-09	TH-232	2.93E-03	2.2E+01	1.7E-10	3.7E-09	4.8E-09
U-234	1.92E-01	3.5E+02	1.6E-11	5.7E-09	U-234	5.77E-01	4.2E+03	1.6E-11	6.8E-08	7.4E-08
U-235/236	1.63E-02	3.0E+01	1.6E-11	4.8E-10	U-235/236	4.88E-02	3.6E+02	1.6E-11	5.7E-09	6.2E-09
U-238	2.00E-01	3.7E+02	2.8E-11	1.0E-08	U-238	5.99E-01	4.4E+03	2.8E-11	1.2E-07	1.3E-07
			Total Pathway:	2.7E-06				Total Pathway:	7.5E-06	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00		
Arsenic	2.89E-02	3.0E-05	1.8E+00	5.2E-05	Arsenic	8.67E-04	3.6E-06	1.8E+00	6.2E-06	5.8E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02		
Beryllium	6.00E-04	6.2E-07	4.3E+00	2.7E-06	Beryllium	5.40E-07	2.2E-09	4.3E+00	9.5E-09	2.7E-06
Lead	4.63E-03	4.8E-06			Lead	3.86E-03	1.6E-05			
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Dieldrin			1.6E+01		Dieldrin			1.6E+01		
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		
Phenanthrene					Phenanthrene					
TH-Total	3.48E-05	3.6E-08			TH-Total	2.90E-05	1.2E-07			
			Total Pathway:	5.5E-05				Total Pathway:	6.2E-06	
			Total Rad + Chem	5.7E-05				Total Rad + Chem	1.4E-05	*Total:* 7.1E-05

TABLE B.4-13(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	3.9E+01	7.2E+04			CS-137	1.38E+01	1.0E+05			
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	3.8E-01	7.1E+02			RA-226	6.92E-01	5.1E+03			
RA-228	3.5E-01	6.4E+02			RA-228	6.35E-01	4.7E+03			
SR-90					SR-90					
TC-99					TC-99					
TH-228	3.6E-03	6.5E+00			TH-228	3.02E-03	2.2E+01			
TH-230	4.9E-03	9.0E+00			TH-230	4.07E-03	3.0E+01			
TH-232	3.5E-03	6.5E+00			TH-232	2.93E-03	2.2E+01			
U-234	1.9E-01	3.5E+02			U-234	5.77E-01	4.2E+03			
U-235/236	1.6E-02	3.0E+01			U-235/236	4.88E-02	3.6E+02			
U-238	2.0E-01	3.7E+02			U-238	5.99E-01	4.4E+03			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254					Aroclor-1254					
Aroclor-1260					Aroclor-1260					
Arsenic	2.9E-02	3.0E-05	3.0E-04	9.9E-02	Arsenic	8.7E-04	3.6E-06	3.0E-04	1.2E-02	1.1E-01
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Benzo(k)fluoranthene					Benzo(k)fluoranthene					
Beryllium	6.0E-04	6.2E-07	5.0E-03	1.2E-04	Beryllium	5.4E-07	2.2E-09	5.0E-03	4.4E-07	1.2E-04
Lead	4.6E-03	4.8E-06			Lead	3.9E-03	1.6E-05			
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene					
Dieldrin			5.0E-05		Dieldrin			5.0E-05		
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
Phenanthrene					Phenanthrene					
TH-Total	3.5E-05	3.6E-08			TH-Total	2.9E-05	1.2E-07			
			Total Pathway:	9.9E-02				Total Pathway:	1.2E-02	
			Total Rad + Chem	9.9E-02				Total Rad + Chem	1.2E-02	*Total:* 1.1E-01

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TABLE B.4-13(d)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total	Total Dust & Groundwater Affected
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk		
CS-137			2.8E-11		CS-137			2.8E-11			4.9E-06
NP-237			2.2E-10		NP-237			2.2E-10			
PU-238			2.2E-10		PU-238			2.2E-10			
PU-239/240			2.3E-10		PU-239/240			2.3E-10			
RA-226			7.8E-10		RA-226			7.8E-10			4.5E-06
RA-228			1.0E-10		RA-228			1.0E-10			5.3E-07
SR-90	7.94E-04	1.5E+00	3.6E-11	5.2E-11	SR-90	4.03E-03	3.0E+01	3.6E-11	1.1E-09	1.1E-09	1.1E-09
TC-99			1.3E-12		TC-99			1.3E-12			
TH-228			5.5E-11		TH-228			5.5E-11			1.6E-09
TH-230			1.3E-11		TH-230			1.3E-11			5.1E-10
TH-232			1.7E-10		TH-232			1.7E-10			4.8E-09
U-234	1.04E-02	1.9E+01	1.6E-11	3.1E-10	U-234	3.22E-02	2.4E+02	1.6E-11	3.8E-09	4.1E-09	7.8E-08
U-235/236	9.40E-04	1.7E+00	1.6E-11	2.8E-11	U-235/236	2.92E-03	2.1E+01	1.6E-11	3.4E-10	3.7E-10	6.6E-09
U-238	1.04E-02	1.9E+01	2.8E-11	5.3E-10	U-238	3.22E-02	2.4E+02	2.8E-11	6.6E-09	7.2E-09	1.4E-07
			Total Pathway:	9.2E-10				Total Pathway:	1.2E-08		

Chemical Risk

Ingestion/Beef					Ingestion/Milk						
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk		
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00			
Aroclor-1260			7.7E+00		Aroclor-1260			7.7E+00			
Arsenic			1.8E+00		Arsenic			1.8E+00			5.8E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01			
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00			
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01			
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene						
Benzo(k)fluoranthene			7.3E-02		Benzo(k)fluoranthene			7.3E-02			
Beryllium			4.3E+00		Beryllium			4.3E+00			2.7E-06
Lead	5.91E-06	6.1E-09			Lead	5.09E-06	2.1E-08				
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00			
Dieldrin			1.6E+01		Dieldrin			1.6E+01			
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01			
Phenanthrene					Phenanthrene						
TH-Total					TH-Total						
2-Methylnaphthalene					2-Methylnaphthalene						
Tributyl phosphate					Tributyl phosphate						
U-Total	9.84E-07	1.0E-09			U-Total	3.22E-07	1.3E-09				
			Total Pathway:					Total Pathway:			
			Total Rad + Chem	9.2E-10				Total Rad + Chem	1.2E-08	*Total:* 1.3E-08	7.1E-05

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TABLE B.4-13(d)
(continued)
SOUTH FIELD: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	7.9E-04	1.5E+00		
TC-99				
TH-228				
TH-230				
TH-232				
U-234	1.0E-02	1.9E+01		
U-235/236	9.4E-04	1.7E+00		
U-238	1.0E-02	1.9E+01		

Ingestion/Milk

Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard
CS-137				
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	4.03E-03	3.0E+01		
TC-99				
TH-228				
TH-230				
TH-232				
U-234	3.22E-02	2.4E+02		
U-235/236	2.92E-03	2.1E+01		
U-238	3.22E-02	2.4E+02		

Total Pathway:

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	5.9E-06	6.1E-09		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	9.8E-07	1.0E-09	3.0E-03	3.4E-07

Total Pathway: 3.4E-07

Total Rad + Chem 3.4E-07

Ingestion/Milk

Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard
Aroclor-1254				
Aroclor-1260				
Arsenic			3.0E-04	
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Beryllium			5.0E-03	
Lead	5.1E-06	2.1E-08		
Dibenzo(a,h)anthracene				
Dieldrin			5.0E-05	
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-Total				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-Total	3.2E-07	1.3E-09	3.0E-03	4.4E-07

Total Pathway: 4.4E-07

Total Rad + Chem 4.4E-07

	Total	Total Dust & Groundwater Affected
		1.1E-01
		1.2E-04
	7.8E-07	7.8E-07
Total:	7.8E-07	1.1E-01

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TABLE B.4-15(a)

RISKS DUE TO BACKGROUND CONCENTRATIONS FUTURE ON-PROPERTY FARMER
(RME VALUES) INACTIVE FLYASH PILE: SURFACE SOIL

Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	Total
NP-237			2.9E-08		
PU-238			3.9E-08		
PU-239/240			3.8E-08		
RA-226	6.89E-06	8.0E-01	7.0E-09	5.6E-09	5.6E-09
RA-228	6.39E-06	7.4E-01	6.9E-10	5.1E-10	5.1E-10
SR-90			6.2E-11		
TH-228	6.28E-06	7.3E-01	7.8E-08	5.7E-08	5.7E-08
TH-230	8.41E-06	9.7E-01	2.9E-08	2.8E-08	2.8E-08
TH-232	6.05E-06	7.0E-01	1.1E-07	7.7E-08	7.7E-08
U-234	5.83E-06	6.8E-01	2.6E-08	1.8E-08	1.8E-08
U-235/236	5.04E-07	5.8E-02	2.5E-08	1.5E-09	1.5E-09
U-238	6.05E-06	7.0E-01	5.2E-08	3.6E-08	3.6E-08

Total Pathway: 2.2E-07

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Arsenic	4.05E-08	2.6E-09	1.5E+01	3.9E-08	3.9E-08
Beryllium	4.20E-09	2.7E-10	8.4E+00	2.3E-09	2.3E-09
Dibenzo(a,h)anthracene			6.1E+00		
Lead	1.34E-07	8.7E-09			
TH-TOTAL	7.47E-08	4.8E-09			
2-Methylnaphthalene					

Total Pathway: 4.2E-08

Total Rad + Chem 2.7E-07 *Total:* 2.7E-07

TABLE B.4-15(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	6.89E-06	8.0E-01		
RA-228	6.39E-06	7.4E-01		
SR-90				
TH-228	6.28E-06	7.3E-01		
TH-230	8.41E-06	9.7E-01		
TH-232	6.05E-06	7.0E-01		
U-234	5.83E-06	6.8E-01		
U-235/236	5.04E-07	5.8E-02		
U-238	6.05E-06	7.0E-01		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	4.05E-08	2.6E-09		
Beryllium	4.20E-09	2.7E-10		
Dibenzo(a,h)anthracene				
Lead	1.34E-07	8.7E-09		
TH-TOTAL	7.47E-08	4.8E-09		
2-Methylnaphthalene				

Total Pathway:

Total Rad + Chem

Total

Total:

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TABLE B.4-15(b)

RISKS DUE TO BACKGROUND CONCENTRATIONS[FUTURE, ON-PROPERTY FARMER [SOUTH FIELD]

FARMER (RME VALUES) INACTIVE FLYASH PILE: GROUNDWATER

CARCINOGENIC RISK

Radiation Risk

Ingestion/Groundwater					Inhalation/Groundwater
Compound	Conc'n (pCi/L)	Intake	SF(o)	Risk	
NP-237			2.2E-10		Not applicable
SR-90	3.7E-06	1.8E-01	3.6E-11	6.5E-12	
TC-99			1.3E-12		
U-234	1.8E-04	8.7E+00	1.6E-11	1.4E-10	
U-235/236	1.6E-05	7.9E-01	1.6E-11	1.3E-11	
U-238	1.8E-04	8.7E+00	2.8E-11	2.4E-10	
Total Pathway:				4.0E-10	Total Pathway:

Chemical Risk

Ingestion/Groundwater					Inhalation/Groundwater			
Compound	Conc'n (mg/L)	Intake	SF(o)	Risk	Compound	Intake	SF(i)	Risk
2-Methylnaphthalene					2-Methylnaphthalene			
Lead	6.4E-05	1.8E-06			Lead	6.6E-06		
Tributyl phosphate					Tributyl phosphate			
U-TOTAL	5.4E-04	1.5E-05			U-TOTAL	5.5E-05		
Total Pathway:					Total Pathway:			
Total Rad + Chem				4.0E-10	Total Rad + Chem			

TABLE B.4-15(b)
(continued)

CARCINOGENIC RISK

Radiation Risk	
Dermal Contact/Groundwater	**Total**
Not applicable	6.5E-12
	1.4E-10
	1.3E-11
	2.4E-10

Total Pathway:

Chemical Risk			
Dermal Contact/Groundwater			
Compound	Intake	SF(derm)	Risk
2-Methylnaphthalene			
Lead	2.0E-11		
Tributyl phosphate			
U-TOTAL	4.2E-08		

Total Pathway:

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem *Total:* 4.0E-10

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TABLE B.4-15(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Groundwater				
Compound	Conc'n (pCi/L)	Intake	RfD(o)	Hazard
NP-237				
SR-90	3.7E-06	1.8E-01		
TC-99				
U-234	1.8E-04	8.7E+00		
U-235/236	1.6E-05	7.9E-01		
U-238	1.8E-04	8.7E+00		
Total Pathway:				

Inhalation/Groundwater
Not applicable
Total Pathway:

Chemical Hazard

Ingestion/Groundwater				
Compound	Conc'n (mg/L)	Intake	RfD(o)	Hazard
2-Methylnaphthalene				
Lead	6.4E-05	1.8E-06		
Tributyl phosphate			5.0E-03	
U-TOTAL	5.4E-04	1.5E-05	3.0E-03	4.9E-03
Total Pathway:				4.9E-03
Total Rad + Chem				4.9E-03

Inhalation/Groundwater			
Compound	Intake	RfD(i)	Hazard
2-Methylnaphthalene			
Lead	6.6E-06		
Tributyl phosphate			
U-TOTAL	5.5E-05		
Total Pathway:			
Total Rad + Chem			

TABLE B.4-15(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard	
Dermal Contact/Groundwater	**Total**
Not applicable	
Total Pathway:	

Chemical Hazard				
Dermal Contact/Groundwater				
Compound	Intake	RfD(derm)	Hazard	
2-Methylnaphthalene				
Lead	2.0E-11			
Tributyl phosphate		4.5E-03		
U-TOTAL	4.2E-08	1.5E-04	2.8E-04	5.2E-03
Total Pathway:			2.8E-04	

Total Rad + Chem 2.8E-04 *Total:* 5.2E-03

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TABLE B.4-15(c)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY [SOUTH FIELD] FARMER (RME VALUES)]

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	3.47E-06	6.8E+00	7.8E-10	5.3E-09
RA-228	3.14E-06	6.2E+00	1.0E-10	6.2E-10
SR-90			3.6E-11	
TH-228	3.07E-06	6.0E+00	5.5E-11	3.3E-10
TH-230	4.20E-06	8.3E+00	1.3E-11	1.1E-10
TH-232	3.03E-06	6.0E+00	1.7E-10	1.0E-09
U-234	2.86E-06	5.6E+00	1.6E-11	9.0E-11
U-235/236	2.47E-07	4.9E-01	1.6E-11	7.8E-12
U-238	2.97E-06	5.8E+00	2.8E-11	1.6E-10
			Total Pathway:	7.7E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	Total
NP-237			2.2E-10		
PU-238			2.2E-10		
PU-239/240			2.3E-10		
RA-226	3.47E-06	3.6E+00	7.8E-10	2.8E-09	8.2E-09
RA-228	3.11E-06	3.2E+00	1.0E-10	3.2E-10	9.4E-10
SR-90			3.6E-11		
TH-228	2.98E-06	3.1E+00	5.5E-11	1.7E-10	5.0E-10
TH-230	4.20E-06	4.4E+00	1.3E-11	5.7E-11	1.6E-10
TH-232	3.03E-06	3.2E+00	1.7E-10	5.4E-10	1.6E-09
U-234	2.86E-06	3.0E+00	1.6E-11	4.8E-11	1.4E-10
U-235/236	2.47E-07	2.6E-01	1.6E-11	4.1E-12	1.2E-11
U-238	2.97E-06	3.1E+00	2.8E-11	8.7E-11	2.5E-10
			Total Pathway:	4.1E-09	

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	2.44E-05	2.7E-08	1.8E+00	4.7E-08
Beryllium	2.20E-06	2.4E-09	4.3E+00	1.0E-08
Dibenzo(a,h)anthracene			7.3E+00	
Lead	6.99E-05	7.7E-08		
TH-TOTAL	3.73E-05	4.1E-08		
2-Methylnaphthalene				
			Total Pathway:	5.7E-08
			Total Rad + Chem	6.5E-08

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	Total
Arsenic	2.44E-05	1.4E-08	1.8E+00	2.5E-08	7.2E-08
Beryllium	2.20E-06	1.3E-09	4.3E+00	5.5E-09	1.6E-08
Dibenzo(a,h)anthracene			7.3E+00		
Lead	6.99E-05	4.1E-08			
TH-TOTAL	3.73E-05	2.2E-08			
2-Methylnaphthalene					
			Total Pathway:	3.0E-08	
			Total Rad + Chem	3.5E-08	*Total:* 1.0E-07

TABLE B.4-15(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	3.5E-06	6.8E+00		
RA-228	3.1E-06	6.2E+00		
SR-90				
TH-228	3.1E-06	6.0E+00		
TH-230	4.2E-06	8.3E+00		
TH-232	3.0E-06	6.0E+00		
U-234	2.9E-06	5.6E+00		
U-235/236	2.5E-07	4.9E-01		
U-238	3.0E-06	5.8E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	3.47E-06	3.6E+00		
RA-228	3.11E-06	3.2E+00		
SR-90				
TH-228	2.98E-06	3.1E+00		
TH-230	4.20E-06	4.4E+00		
TH-232	3.03E-06	3.2E+00		
U-234	2.86E-06	3.0E+00		
U-235/236	2.47E-07	2.6E-01		
U-238	2.97E-06	3.1E+00		

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.4E-05	2.7E-08	3.0E-04	9.0E-05
Beryllium	2.2E-06	2.4E-09	5.0E-03	4.9E-07
Dibenzo(a,h)anthracene				
Lead	7.0E-05	7.7E-08		
TH-TOTAL	3.7E-05	4.1E-08		
2-Methylnaphthalene				

Total Pathway: 9.0E-05

Total Rad + Chem 9.0E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	2.44E-05	1.4E-08	3.0E-04	4.7E-05
Beryllium	2.20E-06	1.3E-09	5.0E-03	2.6E-07
Dibenzo(a,h)anthracene				
Lead	6.99E-05	4.1E-08		
TH-TOTAL	3.73E-05	2.2E-08		
2-Methylnaphthalene				

Total Pathway: 4.8E-05

Total Rad + Chem 4.8E-05

Total	
	1.4E-04
	7.4E-07
Total:	1.4E-04

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TABLE B.4-15(c)

(continued)

INACTIVE FLYASH PILE: HOME GROWN PRODUCE (GROUNDWATER AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	6.40E-08	1.3E-01	3.6E-11	4.5E-12
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.72E-07	1.7E+00	1.6E-11	2.7E-11
U-235/236	7.89E-08	1.6E-01	1.6E-11	2.5E-12
U-238	8.72E-07	1.7E+00	2.8E-11	4.8E-11
TC-99			1.3E-12	

Total Pathway: 8.3E-11

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	6.38E-08	6.7E-02	3.6E-11	2.4E-12
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	8.72E-07	9.1E-01	1.6E-11	1.5E-11
U-235/236	7.89E-08	8.2E-02	1.6E-11	1.3E-12
U-238	8.72E-07	9.1E-01	2.8E-11	2.5E-11
TC-99			1.3E-12	

Total Pathway: 4.4E-11

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	3.40E-04	3.7E-07		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	2.63E-03	2.9E-06		

Total Pathway:

Total Rad + Chem 8.3E-11

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracene			7.3E+00	
Lead	3.40E-04	2.0E-07		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	2.63E-03	1.5E-06		

Total Pathway:

Total Rad + Chem 4.4E-11

	Total	Total Dust & Groundwater Affected
		7.2E-08
		1.6E-08
		8.2E-09
		9.4E-10
	6.9E-12	6.9E-12
		5.0E-10
		1.6E-10
		1.6E-09
	4.2E-11	1.8E-10
	3.8E-12	1.6E-11
	7.4E-11	3.2E-10
Total:	1.3E-10	1.0E-07

TABLE B.4-15(c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	6.4E-08	1.3E-01		
TH-228				
TH-230				
TH-232				
U-234	8.7E-07	1.7E+00		
U-235/236	7.9E-08	1.6E-01		
U-238	8.7E-07	1.7E+00		
TC-99				

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	6.38E-08	6.7E-02		
TH-228				
TH-230				
TH-232				
U-234	8.72E-07	9.1E-01		
U-235/236	7.89E-08	8.2E-02		
U-238	8.72E-07	9.1E-01		
TC-99				

Total Pathway:

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	3.4E-04	3.7E-07		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-TOTAL	2.6E-03	2.9E-06	3.0E-03	9.6E-04

Total Pathway: 9.6E-04

Total Rad + Chem 9.6E-04

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	3.40E-04	2.0E-07		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-TOTAL	2.63E-03	1.5E-06	3.0E-03	4.6E-09

Total Pathway: 4.6E-09

Total Rad + Chem 4.6E-09

	Total	Total Dust & Groundwater Affected
		1.4E-04
		7.4E-07
	9.6E-04	9.6E-04
Total:	9.6E-04	1.1E-03

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TABLE B.4-15(d)

RISKS DUE TO BACKGROUND CONCENTRATIONS FUTURE ON-PROPERTY [SOUTH FIELD] FARMER

(RME VALUES) INACTIVE FLYASH PILE: BEEF AND MILK (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	1.23E-04	2.3E-01	7.8E-10	1.8E-10	RA-226	2.22E-04	1.6E+00	7.8E-10	1.3E-09	1.4E-09
RA-228	7.28E-05	1.3E-01	1.0E-10	1.3E-11	RA-228	1.31E-04	9.6E-01	1.0E-10	9.6E-11	1.1E-10
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	1.56E-06	2.9E-03	5.5E-11	1.6E-13	TH-228	1.30E-06	9.5E-03	5.5E-11	5.2E-13	6.8E-13
TH-230	1.01E-05	1.9E-02	1.3E-11	2.4E-13	TH-230	8.46E-06	6.2E-02	1.3E-11	8.1E-13	1.1E-12
TH-232	7.33E-06	1.3E-02	1.7E-10	2.3E-12	TH-232	6.11E-06	4.5E-02	1.7E-10	7.6E-12	9.9E-12
U-234	5.04E-05	9.3E-02	1.6E-11	1.5E-12	U-234	1.51E-04	1.1E+00	1.6E-11	1.8E-11	1.9E-11
U-235/236	4.36E-06	8.0E-03	1.6E-11	1.3E-13	U-235/236	1.31E-05	9.6E-02	1.6E-11	1.5E-12	1.7E-12
U-238	5.23E-05	9.6E-02	2.8E-11	2.7E-12	U-238	1.57E-04	1.2E+00	2.8E-11	3.2E-11	3.5E-11
			Total Pathway:	2.0E-10				Total Pathway:	1.4E-09	

Chemical Risk

Ingestion/Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	1.24E-05	1.3E-08	1.8E+00	2.2E-08	Arsenic	3.73E-07	1.5E-09	1.8E+00	2.7E-09	2.5E-08
Beryllium	4.12E-07	4.2E-10	4.3E+00	1.8E-09	Beryllium	3.71E-10	1.5E-12	4.3E+00	6.6E-12	1.8E-09
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Lead	2.65E-06	2.7E-09			Lead	2.21E-06	9.1E-09			
TH-TOTAL	9.04E-08	9.3E-11			TH-TOTAL	7.54E-08	3.1E-10			
2-Methylnaphthalene					2-Methylnaphthalene					
			Total Pathway:	2.4E-08				Total Pathway:	2.7E-09	

Total Rad + Chem 2.4E-08

Total Rad + Chem 4.1E-09 *Total:* 2.8E-08

TABLE B.4-15(d)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	1.2E-04	2.3E-01		
RA-228	7.3E-05	1.3E-01		
SR-90				
TH-228	1.6E-06	2.9E-03		
TH-230	1.0E-05	1.9E-02		
TH-232	7.3E-06	1.3E-02		
U-234	5.0E-05	9.3E-02		
U-235/236	4.4E-06	8.0E-03		
U-238	5.2E-05	9.6E-02		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	2.22E-04	1.6E+00		
RA-228	1.31E-04	9.6E-01		
SR-90				
TH-228	1.30E-06	9.5E-03		
TH-230	8.46E-06	6.2E-02		
TH-232	6.11E-06	4.5E-02		
U-234	1.51E-04	1.1E+00		
U-235/236	1.31E-05	9.6E-02		
U-238	1.57E-04	1.2E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.2E-05	1.3E-08	3.0E-04	4.3E-05
Beryllium	4.1E-07	4.2E-10	5.0E-03	8.5E-08
Dibenzo(a,h)anthracene				
Lead	2.7E-06	2.7E-09		
TH-TOTAL	9.0E-08	9.3E-11		
2-Methylnaphthalene				

Total Pathway: 4.3E-05

Total Rad + Chem 4.3E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Hazard
Arsenic	3.73E-07	1.5E-09	3.0E-04	5.1E-06
Beryllium	3.71E-10	1.5E-12	5.0E-03	3.0E-10
Dibenzo(a,h)anthracene				
Lead	2.21E-06	9.1E-09		
TH-TOTAL	7.54E-08	3.1E-10		
2-Methylnaphthalene				

Total Pathway: 5.1E-06

Total Rad + Chem 5.1E-06

	4.8E-05
	8.5E-08

Total: 4.8E-05

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TABLE B.4-15(d)
(continued)
INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)
CARCINOGENIC RISK

Radiation Risk

Ingestion/Beef

Compound	onc'n in Beef (pCi/kg	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	8.33E-06	1.5E-02	3.6E-11	5.5E-13
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	1.04E-05	1.9E-02	1.6E-11	3.1E-13
U-235/236	9.40E-07	1.7E-03	1.6E-11	2.8E-14
U-238	1.04E-05	1.9E-02	2.8E-11	5.3E-13
TC-99			1.3E-12	

Total Pathway: 1.4E-12

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226			7.8E-10	
RA-228			1.0E-10	
SR-90	4.17E-05	3.1E-01	3.6E-11	1.1E-11
TH-228			5.5E-11	
TH-230			1.3E-11	
TH-232			1.7E-10	
U-234	3.22E-05	2.4E-01	1.6E-11	3.8E-12
U-235/236	2.92E-06	2.1E-02	1.6E-11	3.4E-13
U-238	3.22E-05	2.4E-01	2.8E-11	6.6E-12
TC-99			1.3E-12	

Total Pathway: 2.2E-11

Chemical Risk

Ingestion/Beef

Compound	onc'n in Beef (mg/kg	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthracen			7.3E+00	
Lead	7.88E-06	8.1E-09		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	3.13E-05	3.2E-08		

Total Pathway:

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	SF(o)	Risk
Arsenic			1.8E+00	
Beryllium			4.3E+00	
Dibenzo(a,h)anthrace			7.3E+00	
Lead	6.73E-06	2.8E-08		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate				
U-TOTAL	9.71E-05	4.0E-07		

Total Pathway:

	Total	Total Dust & Groundwater Affected
		1.4E-09
		1.1E-10
	1.2E-11	1.2E-11
		6.8E-13
		1.1E-12
		9.9E-12
	4.1E-12	2.3E-11
	3.7E-13	2.0E-12
	7.2E-12	4.2E-11
		2.5E-08
		1.8E-09

Total Rad + Chem 1.4E-12

Total Rad + Chem 2.2E-11 *Total:* 2.3E-11 2.8E-08

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TABLE B.4-15(d)
(continued)
INACTIVE FLYASH PILE: BEEF AND MILK (GROUNDWATER AFFECTED)
NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Beef

Compound	Conc'n in Beef (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226				
RA-228				
SR-90	8.3E-06	1.5E-02		
TH-228				
TH-230				
TH-232				
U-234	1.0E-05	1.9E-02		
U-235/236	9.4E-07	1.7E-03		
U-238	1.0E-05	1.9E-02		
TC-99				
			Total Pathway:	

Ingestion/Milk

Compound	Conc'n in Milk (pCi/L)	Intake	RfD(o)	Risk	Total	Total Dust & Groundwater Affected
NP-237						
PU-238						
PU-239/240						
RA-226						
RA-228						
SR-90	4.17E-05	3.1E-01				
TH-228						
TH-230						
TH-232						
U-234	3.22E-05	2.4E-01				
U-235/236	2.92E-06	2.1E-02				
U-238	3.22E-05	2.4E-01				
TC-99						
			Total Pathway:			

Chemical Hazard

Ingestion/Beef

Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard
Arsenic			3.0E-04	
Beryllium			5.0E-03	
Dibenzo(a,h)anthracene				
Lead	7.9E-06	8.1E-09		
TH-TOTAL				
2-Methylnaphthalene				
Tributyl phosphate			5.0E-03	
U-TOTAL	3.1E-05	3.2E-08	3.0E-03	1.1E-05
			Total Pathway:	1.1E-05
			Total Rad + Chem	1.1E-05

Ingestion/Milk

Compound	Conc'n in Milk (mg/L)	Intake	RfD(o)	Risk	Total	Total Dust & Groundwater Affected
Arsenic			3.0E-04			4.8E-05
Beryllium			5.0E-03			8.5E-08
Dibenzo(a,h)anthracene						
Lead	6.73E-06	2.8E-08				
TH-TOTAL						
2-Methylnaphthalene						
Tributyl phosphate			5.0E-03			
U-TOTAL	9.71E-05	4.0E-07	3.0E-03	1.3E-04	1.4E-04	1.4E-04
			Total Pathway:	1.3E-04		
			Total Rad + Chem	1.3E-04	*Total:* 1.4E-04	1.9E-04

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TABLE B.4-17(a)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]
SOLID WASTE LANDFILL: BACKGROUND SURFACE SOIL
Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237			2.9E-08	
PU-238			3.9E-08	
PU-239/240			3.8E-08	
RA-226	1.12E-04	1.3E+01	7.0E-09	9.1E-08
RA-228	1.04E-04	1.2E+01	6.9E-10	8.3E-09
SR-90			6.2E-11	
TH-228			7.8E-08	
TH-230	1.02E-04	1.2E+01	2.9E-08	3.4E-07
TH-232	1.36E-04	1.6E+01	1.1E-07	1.7E-06
U-234	9.82E-05	1.1E+01	2.6E-08	3.0E-07
U-235/236	9.43E-05	1.1E+01	2.5E-08	2.7E-07
U-238	8.01E-06	9.3E-01	5.2E-08	4.8E-08

Total Pathway: 2.8E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	1.23E+00	5.4E+03	7.8E-10	4.2E-06
RA-228	1.14E+00	5.0E+03	1.0E-10	5.0E-07
SR-90			3.6E-11	
TH-228	1.12E+00	4.9E+03	5.5E-11	2.7E-07
TH-230	1.50E+00	6.6E+03	1.3E-11	8.6E-08
TH-232	1.04E+00	4.6E+03	1.7E-10	7.8E-07
U-234	1.00E+00	4.4E+03	1.6E-11	7.1E-08
U-235/236	8.80E-02	3.9E+02	1.6E-11	6.2E-09
U-238	1.08E+00	4.8E+03	2.8E-11	1.3E-07

Total Pathway: 6.1E-06

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	5.26E-07	3.4E-08	1.5E+01	5.1E-07
Benzo(a)anthracene			6.1E-01	
Benzo(a)pyrene			6.1E+00	
Benzo(b)fluoranthene			6.1E-01	
Benzo(g,h,i)perylene				
Beryllium	5.46E-08	3.5E-09	8.4E+00	3.0E-08
Lead	1.75E-06	1.1E-07		
Dibenzo(a,h)anthracene			6.1E+00	
Indeno(1,2,3-cd)pyrene			6.1E-01	
TH-TOTAL	9.75E-07	6.3E-08		
Phenanthrene				

Total Pathway: 5.4E-07

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	5.78E+00	1.4E-05	1.8E+00	2.5E-05
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium	6.00E-01	1.5E-06	4.3E+00	6.4E-06
Lead	1.92E+01	4.7E-05		
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL	1.07E+01	2.6E-05		
Phenanthrene				

Total Pathway: 3.1E-05

Total Rad + Chem 3.3E-06

Total Rad + Chem 3.7E-05

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TABLE B.4-17(a)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237		4.30E-07		
	PU-238		2.80E-11		
	PU-239/240		2.70E-11		
	RA-226	5.1E+01	6.00E-06	3.1E-04	3.1E-04
	RA-228	4.7E+01	2.90E-06	1.4E-04	1.4E-04
	SR-90				
	TH-228	4.7E+01	5.60E-06	2.6E-04	2.6E-04
	TH-230	6.2E+01	5.40E-11	3.4E-09	4.3E-07
	TH-232	4.3E+01	8.50E-06	3.7E-04	3.7E-04
	U-234	4.2E+01	3.00E-11	1.2E-09	3.7E-07
	U-235/236	3.7E+00	2.40E-07	8.8E-07	1.2E-06
	U-238	4.5E+01	3.60E-08	1.6E-06	1.8E-06
Total Pathway:			Total Pathway:	1.1E-03	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	4.6E-07	1.8E+00	8.4E-07					2.6E-05
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Beryllium	4.7E-07		6.4E-06	Not applicable				1.3E-05
Lead	1.5E-05							
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	8.4E-06							
Phenanthrene								
Total Pathway:			7.2E-06	Total Pathway:				

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 7.2E-06 1.1E-03 *Total:* 1.1E-03

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TABLE B.4-17(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil					Ingestion/Soil				
Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard	Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237					NP-237				
PU-238					PU-238				
PU-239/240					PU-239/240				
RA-226	1.12E-04	1.3E+01			RA-226	1.23	5.4E+03		
RA-228	1.04E-04	1.2E+01			RA-228	1.14	5.0E+03		
SR-90					SR-90				
TH-228					TH-228	1.12	4.9E+03		
TH-230	1.02E-04	1.2E+01			TH-230	1.50	6.6E+03		
TH-232	1.36E-04	1.6E+01			TH-232	1.04	4.6E+03		
U-234	9.82E-05	1.1E+01			U-234	1.00	4.4E+03		
U-235/236	9.43E-05	1.1E+01			U-235/236	0.09	3.9E+02		
U-238	8.01E-06	9.3E-01			U-238	1.08	4.8E+03		
		Total Pathway:					Total Pathway:		

Chemical Hazard

Inhalation of Particulates/Soil					Ingestion/Soil				
Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard	Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	5.26E-07	3.4E-08			Arsenic	5.78	1.4E-05	3.0E-04	4.8E-02
Benzo(a)anthracene					Benzo(a)anthracene				
Benzo(a)pyrene					Benzo(a)pyrene				
Benzo(b)fluoranthene					Benzo(b)fluoranthene				
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene				
Beryllium	5.46E-08	3.5E-09			Beryllium	0.60	1.5E-06	5.0E-03	3.0E-04
Lead	1.75E-06	1.1E-07			Lead	19.20	4.7E-05		
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene				
TH-TOTAL	9.75E-07	6.3E-08			TH-TOTAL	10.70	2.6E-05		
Phenanthrene					Phenanthrene				
		Total Pathway:					Total Pathway:		4.8E-02

Total Rad + Chem

Total Rad + Chem 4.8E-02

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TABLE B.4-17(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard	
Not applicable	NP-237				
	PU-238				
	PU-239/240				
	RA-226	5.1E+01			
	RA-228	4.7E+01			
	SR-90				
	TH-228	4.7E+01			
	TH-230	6.2E+01			
	TH-232	4.3E+01			
	U-234	4.2E+01			
	U-235/236	3.7E+00			
	U-238	4.5E+01			
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	4.6E-07	2.9E-04	1.6E-03					4.9E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Beryllium	4.7E-07	5.0E-05	9.5E-03					9.7E-03
Lead	1.5E-05			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	8.4E-06							
Phenanthrene								
Total Pathway:			1.1E-02	Total Pathway:				

Total Rad + Chem 1.1E-02

otal: 5.9E-02

TABLE B.4-17(b)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	7.90E-04	1.6E+03	7.8E-10	1.2E-06	RA-226	7.92E-04	8.3E+02	7.8E-10	6.4E-07	1.9E-06
RA-228	7.32E-04	1.4E+03	1.0E-10	1.4E-07	RA-228	7.26E-04	7.6E+02	1.0E-10	7.6E-08	2.2E-07
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	4.07E-05	8.0E+01	5.5E-11	4.4E-09	TH-228	4.11E-05	4.3E+01	5.5E-11	2.4E-09	6.8E-09
TH-230	5.46E-05	1.1E+02	1.3E-11	1.4E-09	TH-230	5.68E-05	5.9E+01	1.3E-11	7.7E-10	2.2E-09
TH-232	3.78E-05	7.5E+01	1.7E-10	1.3E-08	TH-232	3.94E-05	4.1E+01	1.7E-10	7.0E-09	2.0E-08
U-234	1.71E-03	3.4E+03	1.6E-11	5.4E-08	U-234	1.71E-03	1.8E+03	1.6E-11	2.9E-08	8.3E-08
U-235/236	1.51E-04	3.0E+02	1.6E-11	4.7E-09	U-235/236	1.51E-04	1.6E+02	1.6E-11	2.5E-09	7.3E-09
U-238	1.85E-03	3.6E+03	2.8E-11	1.0E-07	U-238	1.85E-03	1.9E+03	2.8E-11	5.4E-08	1.6E-07
			Total Pathway:	1.5E-06				Total Pathway:	8.2E-07	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Arsenic	1.48E-02	1.6E-05	1.8E+00	2.9E-05	Arsenic	1.49E-02	8.7E-06	1.8E+00	1.5E-05	4.4E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Beryllium	3.85E-04	4.2E-07	4.3E+00	1.8E-06	Beryllium	3.86E-04	2.3E-07	4.3E+00	9.7E-07	2.8E-06
Lead	7.40E-02	8.1E-05			Lead	7.41E-02	4.3E-05			
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		
TH-TOTAL	3.89E-04	4.3E-07			TH-TOTAL	4.05E-04	2.4E-07			
Phenanthrene					Phenanthrene					
			Total Pathway:	3.0E-05				Total Pathway:	1.6E-05	
			Total Rad + Chem	3.2E-05				Total Rad + Chem	1.7E-05	*Total:* 4.9E-05

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TABLE B.4-17(b)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	7.9E-04	1.6E+03			RA-226	7.92E-04	8.3E+02			
RA-228	7.3E-04	1.4E+03			RA-228	7.26E-04	7.6E+02			
SR-90					SR-90					
TH-228	4.1E-05	8.0E+01			TH-228	4.11E-05	4.3E+01			
TH-230	5.5E-05	1.1E+02			TH-230	5.68E-05	5.9E+01			
TH-232	3.8E-05	7.5E+01			TH-232	3.94E-05	4.1E+01			
U-234	1.7E-03	3.4E+03			U-234	1.71E-03	1.8E+03			
U-235/236	1.5E-04	3.0E+02			U-235/236	1.51E-04	1.6E+02			
U-238	1.8E-03	3.6E+03			U-238	1.85E-03	1.9E+03			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Arsenic	1.5E-02	1.6E-05	3.0E-04	5.4E-02	Arsenic	1.49E-02	8.7E-06	3.0E-04	2.9E-02	8.3E-02
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Beryllium	3.9E-04	4.2E-07	5.0E-03	8.5E-05	Beryllium	3.86E-04	2.3E-07	5.0E-03	4.5E-05	1.3E-04
Lead	7.4E-02	8.1E-05			Lead	7.41E-02	4.3E-05			
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
TH-TOTAL	3.9E-04	4.3E-07			TH-TOTAL	4.05E-04	2.4E-07			
Phenanthrene					Phenanthrene					
		Total Pathway:		5.5E-02			Total Pathway:		2.9E-02	
		Total Rad + Chem		5.5E-02			Total Rad + Chem		2.9E-02	*Total:* 8.4E-02

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TABLE B.4-17(C)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	3.85E-01	7.1E+02	7.8E-10	5.5E-07	RA-226	6.92E-01	5.1E+03	7.8E-10	4.0E-06	4.5E-06
RA-228	3.51E-01	6.4E+02	1.0E-10	6.4E-08	RA-228	6.35E-01	4.7E+03	1.0E-10	4.7E-07	5.3E-07
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	3.56E-03	6.5E+00	5.5E-11	3.6E-10	TH-228	3.02E-03	2.2E+01	5.5E-11	1.2E-09	1.6E-09
TH-230	4.9E-03	9.0E+00	1.30E-11	1.2E-10	TH-230	4.07E-03	3.0E+01	1.3E-11	3.9E-10	5.1E-10
TH-232	3.39E-03	6.2E+00	1.7E-10	1.1E-09	TH-232	2.82E-03	2.1E+01	1.7E-10	3.5E-09	4.6E-09
U-234	1.85E-01	3.4E+02	1.6E-11	5.4E-09	U-234	5.55E-01	4.1E+03	1.6E-11	6.5E-08	7.1E-08
U-235/236	1.63E-02	3.0E+01	1.6E-11	4.8E-10	U-235/236	4.88E-02	3.6E+02	1.6E-11	5.7E-09	6.2E-09
U-238	2.00E-01	3.7E+02	2.8E-11	1.0E-08	U-238	6.00E-01	4.4E+03	2.8E-11	1.2E-07	1.3E-07
			Total Pathway:	6.3E-07				Total Pathway:	4.6E-06	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.89E-02	3.0E-05	1.8E+00	5.2E-05	Arsenic	8.67E-04	3.6E-06	1.8E+00	6.2E-06	5.8E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Beryllium	6.00E-04	6.2E-07	4.3E+00	2.7E-06	Beryllium	5.40E-07	2.2E-09	4.3E+00	9.5E-09	2.7E-06
Lead	1.59E-02	1.6E-05			Lead	1.32E-02	5.4E-05			
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		
TH-TOTAL	3.48E-05	3.6E-08			TH-TOTAL	2.90E-05	1.2E-07			
Phenanthrene					Phenanthrene					
			Total Pathway:	5.5E-05				Total Pathway:	6.2E-06	

Total Rad + Chem 5.5E-05

Total Rad + Chem 1.1E-05 *Total:* 6.6E-05

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TABLE B.4-17(C)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	3.85E-01	7.1E+02			RA-226	6.9E-01	5.1E+03			
RA-228	3.51E-01	6.4E+02			RA-228	6.4E-01	4.7E+03			
SR-90					SR-90					
TH-228	3.56E-03	6.5E+00			TH-228	3.0E-03	2.2E+01			
TH-230	4.88E-03	9.0E+00			TH-230	4.1E-03	3.0E+01			
TH-232	3.39E-03	6.2E+00			TH-232	2.8E-03	2.1E+01			
U-234	1.85E-01	3.4E+02			U-234	5.6E-01	4.1E+03			
U-235/236	1.63E-02	3.0E+01			U-235/236	4.9E-02	3.6E+02			
U-238	2.00E-01	3.7E+02			U-238	6.0E-01	4.4E+03			
		Total Pathway:					Total Pathway:			

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.89E-02	3.0E-05	3.0E-04	9.9E-02	Arsenic	8.7E-04	3.6E-06	3.0E-04	1.2E-02	1.1E-01
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Beryllium	6.00E-04	6.2E-07	5.0E-03	1.2E-04	Beryllium	5.4E-07	2.2E-09	5.0E-03	4.4E-07	1.2E-04
Lead	1.59E-02	1.6E-05			Lead	1.3E-02	5.4E-05			
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
TH-TOTAL	3.48E-05	3.6E-08			TH-TOTAL	2.9E-05	1.2E-07			
Phenanthrene					Phenanthrene					
		Total Pathway:		9.9E-02			Total Pathway:		1.2E-02	
		Total Rad + Chem		9.9E-02			Total Rad + Chem		1.2E-02	*Total:* 1.1E-01

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TABLE B.4-17(a)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]

SOLID WASTE LANDFILL: BACKGROUND SURFACE SOIL

Carcinogenic Risk

Radiation Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (pCi/m3)	Intake	SF(i)	Risk
NP-237			2.9E-08	
PU-238			3.9E-08	
PU-239/240			3.8E-08	
RA-226	1.12E-04	1.3E+01	7.0E-09	9.1E-08
RA-228	1.04E-04	1.2E+01	6.9E-10	8.3E-09
SR-90			6.2E-11	
TH-228			7.8E-08	
TH-230	1.02E-04	1.2E+01	2.9E-08	3.4E-07
TH-232	1.36E-04	1.6E+01	1.1E-07	1.7E-06
U-234	9.82E-05	1.1E+01	2.6E-08	3.0E-07
U-235/236	9.43E-05	1.1E+01	2.5E-08	2.7E-07
U-238	8.01E-06	9.3E-01	5.2E-08	4.8E-08

Total Pathway: 2.8E-06

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	1.23E+00	5.4E+03	7.8E-10	4.2E-06
RA-228	1.14E+00	5.0E+03	1.0E-10	5.0E-07
SR-90			3.6E-11	
TH-228	1.12E+00	4.9E+03	5.5E-11	2.7E-07
TH-230	1.50E+00	6.6E+03	1.3E-11	8.6E-08
TH-232	1.04E+00	4.6E+03	1.7E-10	7.8E-07
U-234	1.00E+00	4.4E+03	1.6E-11	7.1E-08
U-235/236	8.80E-02	3.9E+02	1.6E-11	6.2E-09
U-238	1.08E+00	4.8E+03	2.8E-11	1.3E-07

Total Pathway: 6.1E-06

Chemical Risk

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	SF(i)	Risk
Arsenic	5.26E-07	3.4E-08	1.5E+01	5.1E-07
Benzo(a)anthracene			6.1E-01	
Benzo(a)pyrene			6.1E+00	
Benzo(b)fluoranthene			6.1E-01	
Benzo(g,h,i)perylene				
Beryllium	5.46E-08	3.5E-09	8.4E+00	3.0E-08
Lead	1.75E-06	1.1E-07		
Dibenzo(a,h)anthracene			6.1E+00	
Indeno(1,2,3-cd)pyrene			6.1E-01	
TH-TOTAL	9.75E-07	6.3E-08		
Phenanthrene				

Total Pathway: 5.4E-07

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk
Arsenic	5.78E+00	1.4E-05	1.8E+00	2.5E-05
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium	6.00E-01	1.5E-06	4.3E+00	6.4E-06
Lead	1.92E+01	4.7E-05		
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL	1.07E+01	2.6E-05		
Phenanthrene				

Total Pathway: 3.1E-05

Total Rad + Chem 3.3E-06

Total Rad + Chem 3.7E-05

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TABLE B.4-17(a)
(continued)

Carcinogenic Risk

Radiation Risk

Dermal Contact/Soil	External Radiation/Soil				Total
	Compound	Intake	SF(e)	Risk	
Not applicable	NP-237		4.30E-07		
	PU-238		2.80E-11		
	PU-239/240		2.70E-11		
	RA-226	5.1E+01	6.00E-06	3.1E-04	3.1E-04
	RA-228	4.7E+01	2.90E-06	1.4E-04	1.4E-04
	SR-90				
	TH-228	4.7E+01	5.60E-06	2.6E-04	2.6E-04
	TH-230	6.2E+01	5.40E-11	3.4E-09	4.3E-07
	TH-232	4.3E+01	8.50E-06	3.7E-04	3.7E-04
	U-234	4.2E+01	3.00E-11	1.2E-09	3.7E-07
	U-235/236	3.7E+00	2.40E-07	8.8E-07	1.2E-06
	U-238	4.5E+01	3.60E-08	1.6E-06	1.8E-06
Total Pathway:			Total Pathway:	1.1E-03	

Chemical Risk

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	SF(derm)	Risk	Compound	Intake	SF(e)	Risk	
Arsenic	4.6E-07	1.8E+00	8.4E-07					2.6E-05
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Beryllium	4.7E-07		6.4E-06		Not applicable			1.3E-05
Lead	1.5E-05							
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	8.4E-06							
Phenanthrene								
		Total Pathway:	7.2E-06			Total Pathway:		

For PAHs and Be, dermal carcinogenic risks assumes 1X the oral carcinogenic risk.

Total Rad + Chem 7.2E-06 1.1E-03 *Total:* 1.1E-03

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TABLE B.4-17(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Inhalation of Particulates/Soil

Compound	Conc'n in Air (pCi/m3)	Intake	RfD(i)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	1.12E-04	1.3E+01		
RA-228	1.04E-04	1.2E+01		
SR-90				
TH-228				
TH-230	1.02E-04	1.2E+01		
TH-232	1.36E-04	1.6E+01		
U-234	9.82E-05	1.1E+01		
U-235/236	9.43E-05	1.1E+01		
U-238	8.01E-06	9.3E-01		

Total Pathway:

Ingestion/Soil

Compound	Conc'n (pCi/g)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	1.23	5.4E+03		
RA-228	1.14	5.0E+03		
SR-90				
TH-228	1.12	4.9E+03		
TH-230	1.50	6.6E+03		
TH-232	1.04	4.6E+03		
U-234	1.00	4.4E+03		
U-235/236	0.09	3.9E+02		
U-238	1.08	4.8E+03		

Total Pathway:

Chemical Hazard

Inhalation of Particulates/Soil

Compound	Conc'n-Air (mg/m3)	Intake	RfD(i)	Hazard
Arsenic	5.26E-07	3.4E-08		
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium	5.46E-08	3.5E-09		
Lead	1.75E-06	1.1E-07		
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL	9.75E-07	6.3E-08		
Phenanthrene				

Total Pathway:

Ingestion/Soil

Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	5.78	1.4E-05	3.0E-04	4.8E-02
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium	0.60	1.5E-06	5.0E-03	3.0E-04
Lead	19.20	4.7E-05		
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL	10.70	2.6E-05		
Phenanthrene				

Total Pathway: 4.8E-02

Total Rad + Chem

Total Rad + Chem 4.8E-02

TABLE B.4-17(a)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Dermal Contact/Soil	External Radiation/Soil			Total
	Compound	Intake	RfD(e)	Hazard
Not applicable	NP-237			
	PU-238			
	PU-239/240			
	RA-226	5.1E+01		
	RA-228	4.7E+01		
	SR-90			
	TH-228	4.7E+01		
	TH-230	6.2E+01		
	TH-232	4.3E+01		
	U-234	4.2E+01		
	U-235/236	3.7E+00		
	U-238	4.5E+01		
Total Pathway:	Total Pathway:			

Chemical Hazard

Dermal Contact/Soil				External Radiation/Soil				
Compound	Intake	RfD(derm)	Hazard	Compound	Intake	RfD(e)	Hazard	
Arsenic	4.6E-07	2.9E-04	1.6E-03					4.9E-02
Benzo(a)anthracene								
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Beryllium	4.7E-07	5.0E-05	9.5E-03					9.7E-03
Lead	1.5E-05			Not applicable				
Dibenzo(a,h)anthracene								
Indeno(1,2,3-cd)pyrene								
TH-TOTAL	8.4E-06							
Phenanthrene								
Total Pathway:			1.1E-02	Total Pathway:				

Total Rad + Chem 1.1E-02

otal: 5.9E-02

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TABLE B.4-17(b)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]

SOLID WASTE LANDFILL: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	7.90E-04	1.6E+00	7.8E-10	1.2E-09
RA-228	7.32E-04	1.4E+00	1.0E-10	1.4E-10
SR-90			3.6E-11	
TH-228	4.07E-05	8.0E-02	5.5E-11	4.4E-12
TH-230	5.46E-05	1.1E-01	1.3E-11	1.4E-12
TH-232	3.78E-05	7.5E-02	1.7E-10	1.3E-11
U-234	1.71E-03	3.4E+00	1.6E-11	5.4E-11
U-235/236	1.51E-04	3.0E-01	1.6E-11	4.7E-12
U-238	1.85E-03	3.6E+00	2.8E-11	1.0E-10

Total Pathway: 1.5E-09

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk
NP-237			2.2E-10	
PU-238			2.2E-10	
PU-239/240			2.3E-10	
RA-226	7.92E-04	8.3E-01	7.8E-10	6.4E-10
RA-228	7.26E-04	7.6E-01	1.0E-10	7.6E-11
SR-90			3.6E-11	
TH-228	4.11E-05	4.3E-02	5.5E-11	2.4E-12
TH-230	5.68E-05	5.9E-02	1.3E-11	7.7E-13
TH-232	3.94E-05	4.1E-02	1.7E-10	7.0E-12
U-234	1.71E-03	1.8E+00	1.6E-11	2.9E-11
U-235/236	1.51E-04	1.6E-01	1.6E-11	2.5E-12
U-238	1.85E-03	1.9E+00	2.8E-11	5.4E-11

Total Pathway: 8.2E-10

Total
1.9E-09
2.2E-10
6.8E-12
2.2E-12
2.0E-11
8.3E-11
7.3E-12
1.6E-10

Chemical Risk

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.48E-02	1.6E-05	1.8E+00	2.9E-05
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium	3.85E-04	4.2E-07	4.3E+00	1.8E-06
Lead	7.40E-02	8.1E-05		
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL	3.89E-04	4.3E-07		
Phenanthrene				

Total Pathway: 3.0E-05

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk
Arsenic	1.49E-02	8.7E-06	1.8E+00	1.5E-05
Benzo(a)anthracene			7.3E-01	
Benzo(a)pyrene			7.3E+00	
Benzo(b)fluoranthene			7.3E-01	
Benzo(g,h,i)perylene				
Beryllium	3.86E-04	2.3E-07	4.3E+00	9.7E-07
Lead	7.41E-02	4.3E-05		
Dibenzo(a,h)anthracene			7.3E+00	
Indeno(1,2,3-cd)pyrene			7.3E-01	
TH-TOTAL	4.05E-04	2.4E-07		
Phenanthrene				

Total Pathway: 1.6E-05

Total
4.4E-05
2.8E-06

Total Rad + Chem 3.0E-05

Total Rad + Chem 1.6E-05

Total: 4.7E-05

TABLE B.4-17(b)

(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	7.9E-04	1.6E+00		
RA-228	7.3E-04	1.4E+00		
SR-90				
TH-228	4.1E-05	8.0E-02		
TH-230	5.5E-05	1.1E-01		
TH-232	3.8E-05	7.5E-02		
U-234	1.7E-03	3.4E+00		
U-235/236	1.5E-04	3.0E-01		
U-238	1.8E-03	3.6E+00		

Total Pathway:

Ingestion/Fruit

Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard
NP-237				
PU-238				
PU-239/240				
RA-226	7.92E-04	8.3E-01		
RA-228	7.26E-04	7.6E-01		
SR-90				
TH-228	4.11E-05	4.3E-02		
TH-230	5.68E-05	5.9E-02		
TH-232	3.94E-05	4.1E-02		
U-234	1.71E-03	1.8E+00		
U-235/236	1.51E-04	1.6E-01		
U-238	1.85E-03	1.9E+00		

Total Pathway:

Total

Chemical Hazard

Ingestion/Vegetables

Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.5E-02	1.6E-05	3.0E-04	5.4E-02
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium	3.9E-04	4.2E-07	5.0E-03	8.5E-05
Lead	7.4E-02	8.1E-05		
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL	3.9E-04	4.3E-07		
Phenanthrene				

Total Pathway: 5.5E-02

Total Rad + Chem 5.5E-02

Ingestion/Fruit

Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard
Arsenic	1.49E-02	8.7E-06	3.0E-04	2.9E-02
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Beryllium	3.86E-04	2.3E-07	5.0E-03	4.5E-05
Lead	7.41E-02	4.3E-05		
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
TH-TOTAL	4.05E-04	2.4E-07		
Phenanthrene				

Total Pathway: 2.9E-02

Total Rad + Chem 2.9E-02

Total

8.3E-02

1.3E-04

Total: 8.4E-02

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TABLE B.4-17(C)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]
SOLID WASTE LANDFILL: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	3.85E-01	7.1E+02	7.8E-10	5.5E-07	RA-226	6.92E-01	5.1E+03	7.8E-10	4.0E-06	4.5E-06
RA-228	3.51E-01	6.4E+02	1.0E-10	6.4E-08	RA-228	6.35E-01	4.7E+03	1.0E-10	4.7E-07	5.3E-07
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	3.56E-03	6.5E+00	5.5E-11	3.6E-10	TH-228	3.02E-03	2.2E+01	5.5E-11	1.2E-09	1.6E-09
TH-230	4.9E-03	9.0E+00	1.30E-11	1.2E-10	TH-230	4.07E-03	3.0E+01	1.3E-11	3.9E-10	5.1E-10
TH-232	3.39E-03	6.2E+00	1.7E-10	1.1E-09	TH-232	2.82E-03	2.1E+01	1.7E-10	3.5E-09	4.6E-09
U-234	1.85E-01	3.4E+02	1.6E-11	5.4E-09	U-234	5.55E-01	4.1E+03	1.6E-11	6.5E-08	7.1E-08
U-235/236	1.63E-02	3.0E+01	1.6E-11	4.8E-10	U-235/236	4.88E-02	3.6E+02	1.6E-11	5.7E-09	6.2E-09
U-238	2.00E-01	3.7E+02	2.8E-11	1.0E-08	U-238	6.00E-01	4.4E+03	2.8E-11	1.2E-07	1.3E-07
			Total Pathway:	6.3E-07				Total Pathway:	4.6E-06	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n in Beef (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Arsenic	2.89E-02	3.0E-05	1.8E+00	5.2E-05	Arsenic	8.67E-04	3.6E-06	1.8E+00	6.2E-06	5.8E-05
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Beryllium	6.00E-04	6.2E-07	4.3E+00	2.7E-06	Beryllium	5.40E-07	2.2E-09	4.3E+00	9.5E-09	2.7E-06
Lead	1.59E-02	1.6E-05			Lead	1.32E-02	5.4E-05			
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		
TH-TOTAL	3.48E-05	3.6E-08			TH-TOTAL	2.90E-05	1.2E-07			
Phenanthrene					Phenanthrene					
			Total Pathway:	5.5E-05				Total Pathway:	6.2E-06	

Total Rad + Chem 5.5E-05

Total Rad + Chem 1.1E-05 *Total:* 6.6E-05

TABLE B.4-17(C)
(continued)

Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (pCi/g)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Risk	
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	3.85E-01	7.1E+02			RA-226	6.9E-01	5.1E+03			
RA-228	3.51E-01	6.4E+02			RA-228	6.4E-01	4.7E+03			
SR-90					SR-90					
TH-228	3.56E-03	6.5E+00			TH-228	3.0E-03	2.2E+01			
TH-230	4.88E-03	9.0E+00			TH-230	4.1E-03	3.0E+01			
TH-232	3.39E-03	6.2E+00			TH-232	2.8E-03	2.1E+01			
U-234	1.85E-01	3.4E+02			U-234	5.6E-01	4.1E+03			
U-235/236	1.63E-02	3.0E+01			U-235/236	4.9E-02	3.6E+02			
U-238	2.00E-01	3.7E+02			U-238	6.0E-01	4.4E+03			
Total Pathway:					Total Pathway:					

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n in Beef (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Arsenic	2.89E-02	3.0E-05	3.0E-04	9.9E-02	Arsenic	8.7E-04	3.6E-06	3.0E-04	1.2E-02	1.1E-01
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
Beryllium	6.00E-04	6.2E-07	5.0E-03	1.2E-04	Beryllium	5.4E-07	2.2E-09	5.0E-03	4.4E-07	1.2E-04
Lead	1.59E-02	1.6E-05			Lead	1.3E-02	5.4E-05			
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
TH-TOTAL	3.48E-05	3.6E-08			TH-TOTAL	2.9E-05	1.2E-07			
Phenanthrene					Phenanthrene					
Total Pathway:				9.9E-02	Total Pathway:				1.2E-02	
Total Rad + Chem				9.9E-02	Total Rad + Chem				1.2E-02	*Total:* 1.1E-01

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TABLE B.4-19(a)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY FARMER]
(RME VALUES) LIME SLUDGE PONDS: SURFACE SOIL
CARCINOGENIC RISK

Radiation Risk					
Inhalation of Particulates/Soil					Total
Compound	Conc'n in Air (pCi/m3)	Intake	SF(i)	Risk	
CS-137	6.60E-06	7.7E-01	1.9E-11	1.5E-11	1.5E-11
NP-237			2.9E-08		
PU-238			3.9E-08		
PU-239/240			3.8E-08		
RA-226	1.84E-05	2.1E+00	7.0E-09	1.5E-08	1.5E-08
RA-228	1.71E-05	2.0E+00	6.9E-10	1.4E-09	1.4E-09
SR-90			6.2E-11		
TH-228	1.68E-05	1.9E+00	7.8E-08	1.5E-07	1.5E-07
TH-230	2.24E-05	2.6E+00	2.9E-08	7.5E-08	7.5E-08
TH-232	1.62E-05	1.9E+00	1.1E-07	2.1E-07	2.1E-07
U-234	1.55E-05	1.8E+00	2.6E-08	4.7E-08	4.7E-08
U-235/236	1.32E-06	1.5E-01	2.5E-08	3.8E-09	3.8E-09
U-238	1.62E-05	1.9E+00	5.2E-08	9.8E-08	9.8E-08
			Total Pathway:	6.0E-07	

Chemical Risk					
Inhalation of Particulates/Soil					
Compound	Conc'n (mg/m3)	Intake	SF(i)	Risk	
Aroclor-1254					
Arsenic	8.70E-08	5.6E-09	1.5E+01	8.5E-08	8.5E-08
Benzo(a)pyrene			6.1E+00		
Benzo(a)anthracene			6.1E-01		
Benzo(b)fluoranthene			6.1E-01		
Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalate					
Beryllium	9.00E-09	5.8E-10	8.4E+00	4.9E-09	4.9E-09
Lead	2.90E-07	1.9E-08			
Dibenzo(a,h)anthracene			6.1E+00		
Indeno(1,2,3-cd)pyrene			6.1E-01		
Phenanthrene					
TH-TOTAL	1.63E-07	1.1E-08			
U-TOTAL	4.90E-08	3.2E-09			
			Total Pathway:	8.9E-08	

Total Rad + Chem 6.9E-07 *Total:* 6.9E-07

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TABLE B.4-19(a)
(continued)

NON-CARCINOGENIC HAZARD

Radiation Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n-Air (pCi/m3)	Intake	RfD(i)	Hazard
CS-137	6.60E-06	7.7E-01		
NP-237				
PU-238				
PU-239/240				
RA-226	1.84E-05	2.1E+00		
RA-228	1.71E-05	2.0E+00		
SR-90				
TH-228	1.68E-05	1.9E+00		
TH-230	2.24E-05	2.6E+00		
TH-232	1.62E-05	1.9E+00		
U-234	1.55E-05	1.8E+00		
U-235/236	1.32E-06	1.5E-01		
U-238	1.62E-05	1.9E+00		

Total Pathway:

Chemical Hazard				
Inhalation of Particulates/Soil				
Compound	Conc'n (mg/m3)	Intake	RfD(i)	Hazard
Aroclor-1254				
Arsenic	8.70E-08	5.6E-09		
Benzo(a)pyrene				
Benzo(a)anthracene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
bis(2-Ethylhexyl)phthalate				
Beryllium	9.00E-09	5.8E-10		
Lead	2.90E-07	1.9E-08		
Dibenzo(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Phenanthrene				
TH-TOTAL	1.63E-07	1.1E-08		
U-TOTAL	4.90E-08	3.2E-09		

Total Pathway:

Total Rad + Chem

Total

Total:

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TABLE B.4-19(b)
RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE, ON-PROPERTY FARMER (RME VALUES)]
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Carcinogenic Risk

Radiation Risk

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (pCi/L)	Intake	SF(o)	Risk	
CS-137	1.50E-02	2.8E+01	2.8E-11	7.7E-10	CS-137	5.26E-03	3.9E+01	2.8E-11	1.1E-09	1.9E-09
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	9.07E-04	1.7E+00	7.8E-10	1.3E-09	RA-226	1.63E-03	1.2E+01	7.8E-10	9.4E-09	1.1E-08
RA-228	1.97E-04	3.6E-01	1.0E-10	3.6E-11	RA-228	3.54E-04	2.6E+00	1.0E-10	2.6E-10	3.0E-10
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	4.17E-06	7.7E-03	5.5E-11	4.2E-13	TH-228	3.48E-06	2.6E-02	5.5E-11	1.4E-12	1.8E-12
TH-230	2.96E-05	5.4E-02	1.3E-11	7.1E-13	TH-230	2.46E-05	1.8E-01	1.3E-11	2.4E-12	3.1E-12
TH-232	1.96E-05	3.6E-02	1.7E-10	6.1E-12	TH-232	1.63E-05	1.2E-01	1.7E-10	2.0E-11	2.7E-11
U-234	1.80E-04	3.3E-01	1.6E-11	5.3E-12	U-234	5.41E-04	4.0E+00	1.6E-11	6.4E-11	6.9E-11
U-235/236	1.54E-05	2.8E-02	1.6E-11	4.5E-13	U-235/236	4.61E-05	3.4E-01	1.6E-11	5.4E-12	5.9E-12
U-238	1.89E-04	3.5E-01	2.8E-11	9.7E-12	U-238	5.66E-04	4.2E+00	2.8E-11	1.2E-10	1.3E-10
			Total Pathway:	2.1E-09				Total Pathway:	1.1E-08	

Chemical Risk

Ingestion of Beef					Ingestion/Milk					
Compound	Conc'n (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Milk (mg/L)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		
Arsenic	2.7E-05	2.7E-08	1.8E+00	4.8E-08	Arsenic	8.0E-07	3.3E-09	1.8E+00	5.8E-09	5.4E-08
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalate			1.4E-02		bis(2-Ethylhexyl)phthalate			1.4E-02		
Beryllium	2.3E-06	2.3E-09	4.3E+00	1.0E-08	Beryllium	2.1E-09	8.4E-12	4.3E+00	3.6E-11	1.0E-08
Lead	7.3E-05	7.5E-08			Lead	6.1E-05	2.5E-07			
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		
Phenanthrene					Phenanthrene					
TH-TOTAL	2.2E-07	2.2E-10			TH-TOTAL	1.8E-07	7.4E-10			
U-TOTAL	5.7E-07	5.9E-10			U-TOTAL	1.7E-06	7.0E-09			
			Total Pathway:	5.8E-08				Total Pathway:	5.8E-09	
			Total Rad + Chem	6.0E-08				Total Rad + Chem	1.7E-08	*Total:* 7.7E-08

TABLE B.4-19(b)
(continued)
LIME SLUDGE PONDS: BEEF AND MILK (DUST AFFECTED)
Non-carcinogenic Hazard

Radiation Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (pCi/L)	Intake	RfD(o)	Hazard	
CS-137	1.5E-02	2.8E+01			CS-137	5.26E-03	3.9E+01			
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	9.1E-04	1.7E+00			RA-226	1.63E-03	1.2E+01			
RA-228	2.0E-04	3.6E-01			RA-228	3.54E-04	2.6E+00			
SR-90					SR-90					
TH-228	4.2E-06	7.7E-03			TH-228	3.48E-06	2.6E-02			
TH-230	3.0E-05	5.4E-02			TH-230	2.46E-05	1.8E-01			
TH-232	2.0E-05	3.6E-02			TH-232	1.63E-05	1.2E-01			
U-234	1.8E-04	3.3E-01			U-234	5.41E-04	4.0E+00			
U-235/236	1.5E-05	2.8E-02			U-235/236	4.61E-05	3.4E-01			
U-238	1.9E-04	3.5E-01			U-238	5.66E-04	4.2E+00			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion of Beef					Ingestion/Milk					Total
Compound	Conc'n (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Milk (mg/L)	Intake	RfD(o)	Hazard	
Aroclor-1254					Aroclor-1254					
Arsenic	2.7E-05	2.7E-08	3.0E-04	9.1E-05	Arsenic	8.0E-07	3.3E-09	3.0E-04	1.1E-05	1.0E-04
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalate			2.0E-02		bis(2-Ethylhexyl)phthalate			2.0E-02		
Beryllium	2.3E-06	2.3E-09	5.0E-03	4.7E-07	Beryllium	2.1E-09	8.4E-12	5.0E-03	1.7E-09	4.7E-07
Lead	7.3E-05	7.5E-08			Lead	6.1E-05	2.5E-07			
Dibenzo(a,h)anthracene.					Dibenzo(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
Phenanthrene					Phenanthrene					
TH-TOTAL	2.2E-07	2.2E-10			TH-TOTAL	1.8E-07	7.4E-10			
U-TOTAL	5.7E-07	5.9E-10	3.0E-03	2.0E-07	U-TOTAL	1.7E-06	7.0E-09	3.0E-03	2.3E-06	2.5E-06
			Total Pathway:	9.2E-05				Total Pathway:	1.3E-05	
			Total Rad + Chem	9.2E-05				Total Rad + Chem	1.3E-05	*Total:* 1.1E-04

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TABLE B.4-19 (c)

RISKS DUE TO BACKGROUND CONCENTRATIONS [FUTURE ON-PROPERTY [SOLID WASTE LANDFILL] FARMER (RME VALUES)]

LIME SLUDGE PONDS: HOME GROWN PRODUCE (DUST AFFECTED)

CARCINOGENIC RISK

Radiation Risk

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (pCi/kg)	Intake	SF(o)	Risk	
CS-137	4.57E-06	9.0E+00	2.8E-11	2.5E-10	CS-137	4.56E-06	4.8E+00	2.8E-11	1.3E-10	3.9E-10
NP-237			2.2E-10		NP-237			2.2E-10		
PU-238			2.2E-10		PU-238			2.2E-10		
PU-239/240			2.3E-10		PU-239/240			2.3E-10		
RA-226	1.05E-05	2.1E+01	7.8E-10	1.6E-08	RA-226	1.05E-05	1.1E+01	7.8E-10	8.5E-09	2.5E-08
RA-228	8.40E-06	1.7E+01	1.0E-10	1.7E-09	RA-228	8.32E-06	8.7E+00	1.0E-10	8.7E-10	2.5E-09
SR-90			3.6E-11		SR-90			3.6E-11		
TH-228	8.21E-06	1.6E+01	5.5E-11	8.9E-10	TH-228	7.98E-06	8.3E+00	5.5E-11	4.6E-10	1.3E-09
TH-230	1.12E-05	2.2E+01	1.3E-11	2.9E-10	TH-230	1.12E-05	1.2E+01	1.3E-11	1.5E-10	4.4E-10
TH-232	8.10E-06	1.6E+01	1.7E-10	2.7E-09	TH-232	8.10E-06	8.5E+00	1.7E-10	1.4E-09	4.1E-09
U-234	8.02E-06	1.6E+01	1.6E-11	2.5E-10	U-234	8.02E-06	8.4E+00	1.6E-11	1.3E-10	3.9E-10
U-235/236	6.83E-07	1.3E+00	1.6E-11	2.2E-11	U-235/236	6.83E-07	7.1E-01	1.6E-11	1.1E-11	3.3E-11
U-238	8.39E-06	1.7E+01	2.8E-11	4.6E-10	U-238	8.39E-06	8.8E+00	2.8E-11	2.5E-10	7.1E-10
			Total Pathway:	2.3E-08				Total Pathway:	1.2E-08	

Chemical Risk

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	SF(o)	Risk	Compound	Conc'n-Fruit (mg/kg)	Intake	SF(o)	Risk	
Aroclor-1254			7.7E+00		Aroclor-1254			7.7E+00		
Arsenic	5.24E-05	5.8E-08	1.8E+00	1.0E-07	Arsenic	5.24E-05	3.1E-08	1.8E+00	5.4E-08	1.5E-07
Benzo(a)pyrene			7.3E+00		Benzo(a)pyrene			7.3E+00		
Benzo(a)anthracene			7.3E-01		Benzo(a)anthracene			7.3E-01		
Benzo(b)fluoranthene			7.3E-01		Benzo(b)fluoranthene			7.3E-01		
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalate			1.4E-02		bis(2-Ethylhexyl)phthalate			1.4E-02		
Beryllium	5.62E-06	6.2E-09	4.3E+00	2.7E-08	Beryllium	5.62E-06	3.3E-09	4.3E+00	1.4E-08	4.1E-08
Lead	4.64E-04	5.1E-07			Lead	4.64E-04	2.7E-07			
Dibenzo(a,h)anthracene			7.3E+00		Dibenzo(a,h)anthracene			7.3E+00		
Indeno(1,2,3-cd)pyrene			7.3E-01		Indeno(1,2,3-cd)pyrene			7.3E-01		
Phenanthrene					Phenanthrene					
TH-TOTAL	8.18E-05	9.0E-08			TH-TOTAL	8.18E-05	4.8E-08			
U-TOTAL	2.54E-05	2.8E-08			U-TOTAL	2.54E-05	1.5E-08			
			Total Pathway:	1.3E-07				Total Pathway:	6.8E-08	

Total Rad + Chem	1.5E-07	Total Rad + Chem	8.0E-08
		Total:	2.3E-07

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TABLE B.4-19 (c)
(continued)

NONCARCINOGENIC HAZARD

Radiation Hazard

Ingestion/Vegetables					Ingestion/Fruit					Total
Compound	Conc'n-Veg. (pCi/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (pCi/kg)	Intake	RfD(o)	Hazard	
CS-137	4.6E-06	9.0E+00			CS-137	4.56E-06	4.8E+00			
NP-237					NP-237					
PU-238					PU-238					
PU-239/240					PU-239/240					
RA-226	1.0E-05	2.1E+01			RA-226	1.05E-05	1.1E+01			
RA-228	8.4E-06	1.7E+01			RA-228	8.32E-06	8.7E+00			
SR-90					SR-90					
TH-228	8.2E-06	1.6E+01			TH-228	7.98E-06	8.3E+00			
TH-230	1.1E-05	2.2E+01			TH-230	1.12E-05	1.2E+01			
TH-232	8.1E-06	1.6E+01			TH-232	8.10E-06	8.5E+00			
U-234	8.0E-06	1.6E+01			U-234	8.02E-06	8.4E+00			
U-235/236	6.8E-07	1.3E+00			U-235/236	6.83E-07	7.1E-01			
U-238	8.4E-06	1.7E+01			U-238	8.39E-06	8.8E+00			
			Total Pathway:					Total Pathway:		

Chemical Hazard

Ingestion/Vegetables					Ingestion/Fruit					
Compound	Conc'n-Veg. (mg/kg)	Intake	RfD(o)	Hazard	Compound	Conc'n-Fruit (mg/kg)	Intake	RfD(o)	Hazard	
Aroclor-1254					Aroclor-1254					
Arsenic	5.2E-05	5.8E-08	3.0E-04	1.9E-04	Arsenic	5.24E-05	3.1E-08	3.0E-04	1.0E-04	2.9E-04
Benzo(a)pyrene					Benzo(a)pyrene					
Benzo(a)anthracene					Benzo(a)anthracene					
Benzo(b)fluoranthene					Benzo(b)fluoranthene					
Benzo(g,h,i)perylene					Benzo(g,h,i)perylene					
bis(2-Ethylhexyl)phthalat			2.0E-02		bis(2-Ethylhexyl)phthalat			2.0E-02		
Beryllium	5.6E-06	6.2E-09	5.0E-03	1.2E-06	Beryllium	5.62E-06	3.3E-09	5.0E-03	6.6E-07	1.9E-06
Lead	4.6E-04	5.1E-07			Lead	4.64E-04	2.7E-07			
Dibenzo(a,h)anthracene					Dibenzo(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					Indeno(1,2,3-cd)pyrene					
Phenanthrene					Phenanthrene					
TH-TOTAL	8.2E-05	9.0E-08			TH-TOTAL	8.18E-05	4.8E-08			
U-TOTAL	2.5E-05	2.8E-08	3.0E-03	9.3E-06	U-TOTAL	2.54E-05	1.5E-08	3.0E-03	4.9E-06	1.4E-05
			Total Pathway:	2.0E-04				Total Pathway:	1.1E-04	

Total Rad + Chem 2.0E-04 | Total Rad + Chem 1.1E-04 | *Total:* 3.1E-04

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