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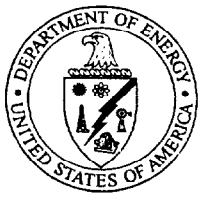
Certification Docket for the Remedial Action Performed at the General Motors Site in Adrian, Michigan

Department of Energy
Office of Assistant Manager
for Environmental Management
Oak Ridge Operations

January 2001



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CERTIFICATION DOCKET

FOR THE

REMEDIAL ACTION PERFORMED AT THE

GENERAL MOTORS SITE

ADRIAN, MICHIGAN

JANUARY 2001

Prepared for

United States Army

Corps of Engineers

Under Contract No. DACW45-98-D-0028

By

Bechtel National, Inc.

Oak Ridge, Tennessee

Bechtel Job No. 14501

CONTENTS

CONTENTS
(Continued)

FIGURES

TABLES

ACRONYMS

ACM	asbestos-containing material
AEC	U.S. Atomic Energy Commission
ALARA	as low as reasonably achievable
BNI	Bechtel National, Inc.
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLSM	controlled low strength material
DCG	derived concentration guide
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ERDA	U.S. Energy Research and Development Administration
FSRD	Former Sites Restoration Division
FUSRAP	Formerly Utilized Sites Remedial Action Program
GM	General Motors
IVC	independent verification contractor
LLRW	low-level radioactive waste
LSA	low-specific-activity
MED	Manhattan Engineer District
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
ORNL	Oak Ridge National Laboratory
OSHA	U.S. Occupational Safety and Health Administration
PMC	Project Management Contractor
PPE	personal protection equipment
RCRA	Resource Conservation and Recovery Act
RSS	radiological support subcontractor
SAIC	Science Applications International Corporation
SEA	Science & Engineering Associates
TN	Thermo NUtech
USACE	U.S. Army Corps of Engineers

UNITS OF MEASURE

cm	centimeter
cpm	counts per minute
dpm	disintegrations per minute
ft	foot
g	gram
gal	gallon
h	hour
in.	inch
lb	pound
m	meter
mi	mile
µCi	microcurie
mL	milliliter
µR	microroentgen
mrad	millirad
mrem	millirem
pCi	picocurie
yd	yard
yr	year

INTRODUCTION

The U.S. Department of Energy (DOE), Office of Environmental Management, Division of Off-Site Programs conducted a remedial action project at the former Bridgeport Brass Specialty Metals Plant in Adrian, Michigan under the expedited protocol for remedial action at small sites from April 1995 to July 1995. Expedited protocol is an efficient, cost-effective approach that streamlines the remedial action process at small sites. The current site owner is the General Motors, Inland Fisher Guide Division (GM). The work at the GM site was administered by the Formerly Utilized Sites Remedial Action Program (FUSRAP).

FUSRAP was created in 1974 by the U.S. Atomic Energy Commission (AEC) under the Atomic Energy Act of 1954, as amended. It is an environmental restoration program that primarily addresses low levels of radioactive contamination on properties that are predominantly privately owned and have few if any institutional controls. The objectives of FUSRAP as they apply to the GM site are to

- identify and assess sites used for early Manhattan Engineer District (MED)/AEC nuclear work to determine whether further decontamination and/or control is needed;
- decontaminate and/or apply controls to the sites, where needed, to permit conformance to current applicable guidelines;
- dispose of and/or stabilize all generated radioactive waste residues in an environmentally acceptable manner;
- accomplish work in accordance with appropriate landowner agreements and local and state environmental and land-use requirements to the extent required by federal law and applicable regulations, standards, policies, and procedures;
- remove hazardous waste that is mingled or "mixed" with radioactively contaminated waste resulting from MED/AEC-related work, regardless of the hazardous characteristics; and
- certify, at the completion of the remedial action, that the condition of the site complies with guidelines and that the release of the site without radiological restrictions is appropriate.

Formerly administered by the U.S. Department of Energy (DOE), FUSRAP is now managed by the U.S. Army Corps of Engineers (USACE). Bechtel National, Inc. (BNI) was the project management contractor (PMC) for FUSRAP activities at the GM site. Thermo NUtech (TN) was the radiological support subcontractor (RSS) for analytical support and health physics technician support for activities at the GM site. Science Applications International Corporation (SAIC), the environmental studies subcontractor,

conducted the hazard assessment, and Oak Ridge National Laboratory (ORNL) was the independent verification contractor (IVC) for the site.

Environmental Regulations Applicable to FUSRAP

To assess the environmental impacts of federal actions, Executive Order 11991 empowered the Council on Environmental Quality (CEQ) to issue regulations to federal agencies for implementing the procedural provisions of the National Environmental Policy Act (NEPA) that are mandatory under law. In June 1979, CEQ issued regulations containing guidance and specific requirements. DOE guidelines for implementing the NEPA process and satisfying the CEQ regulations were subsequently issued and became effective on March 28, 1980. These regulations were revised April 24, 1992 (57 *FR* 15122).

The NEPA process requires FUSRAP decision-makers to identify and assess the environmental consequences of proposed actions before beginning remedial action, developing disposal sites, or transporting and emplacing radioactive wastes. For the remedial activities discussed in this certification docket, the NEPA requirements were satisfied by the preparation and approval of a categorical exclusion for the remedial action. The categorical exclusion document confirmed that there would be no adverse effects on the public or the environment from the planned remedial activities.

Remedial activities at the GM site were performed as part of FUSRAP in accordance with the protocols and procedures established by DOE. Construction and service subcontractors and other project subcontractors are governed by the provisions of the quality assurance program developed for the project and are in compliance with DOE Order 5700.6C. The effectiveness of the quality assurance program is assessed regularly by the BNI quality assurance organization.

Property Identification

The GM site consisted of a major automotive parts manufacturing facility. The total interior area requiring remedial action was approximately 3,800 m^2 (41,000 ft^2); an outdoor area measuring approximately 0.9 m^2 (3 ft^2) southeast of the main building also required remediation.

A removal action was conducted at the site from April to July 1995. Post-remedial action surveys and samples demonstrated, and DOE certified, that the locations remediated are in compliance with the cleanup criteria for this site and supplemental limits from the hazard assessment conducted for the site. A notice of certification of the radiological condition of the site was published in the *Federal Register* on January 29, 1997.

Docket Contents

The purpose of this docket is to document that the radioactively contaminated areas at the GM site were successfully remediated in 1995. The material in this docket consists of documents supporting

certification that conditions at the subject property are in compliance with the criteria and standards determined to be applicable. Furthermore, this certification docket provides the documents certifying that the future use of the property will not result in any significant hazard or radiation dose to the general public as a result of residual radioactivity remaining onsite that originated during activities conducted by DOE or its predecessor agencies.

Exhibit I of this docket is a summary of remedial activities conducted at the GM site. The exhibit provides a brief history of the origin of the contamination, the radiological characterization activities conducted, the remedial action performed, hazard assessment conducted, post-remedial action survey and soil sample results, and independent verification activities. Cost information from all phases of the remedial actions conducted at the site is also included in Exhibit I. Appendix A of Exhibit I contains the DOE guidelines for residual radioactive materials at FUSRAP sites.

Exhibit II consists of the letters, memorandums, and reports that were produced to document the entire remedial action process from designation of the site under FUSRAP to the certification that no radiological restrictions limit the future use of the site. Documents that are brief are included in Exhibit II. Lengthy documents are referenced in the exhibit and are provided as an attachment to the certification docket available at the Adrian, Michigan, Public Library; the DOE Public Reading Room in Washington, D.C.; and the DOE Public Document Room in Oak Ridge, Tennessee.

Exhibit III provides diagrams of the site identifying the areas of contamination that were remediated during cleanup activities.

The certification docket and associated references will be available at the Adrian Public Library, 143 East Maumee Street in Adrian, Michigan.

EXHIBIT I
SUMMARY OF REMEDIAL ACTION
AT THE GENERAL MOTORS SITE
IN ADRIAN, MICHIGAN

1.0 INTRODUCTION

This exhibit summarizes the activities culminating in the certification that radiological conditions at the General Motors (GM) site in Adrian, Michigan, formerly the Bridgeport Brass Special Metals Extrusion Plant, are in compliance with applicable guidelines. Standards and criteria governing the release of properties for radiologically unrestricted future use are included in U.S. Department of Energy (DOE) Order 5400.5, "Radiation Protection of the Public and Environment," and are comparable to those currently used by the U.S. Environmental Protection Agency (EPA) and the U.S. Nuclear Regulatory Commission (NRC). These activities were conducted under the Formerly Utilized Sites Remedial Action Program (FUSRAP) (Ref. 1), formerly administered by DOE and currently managed by the U.S. Army Corps of Engineers (USACE). This summary includes a discussion of remedial action at the site, including

- characterization of the chemical and radiological status of the site,
- designation of the property as requiring remedial action,
- performance of the remedial action, and
- verification that the radioactivity above the guideline has been removed.

Further details on each activity described in this exhibit are included in the referenced documents.

2.0 SITE HISTORY

During the 1950s, the Bridgeport Brass Company operated a Special Metals Extrusion Plant at the GM site in Adrian, Michigan, under contract AT-(30-1)-1405 with the U.S. Atomic Energy Commission (AEC). The plant was operated to extrude uranium metal, which was used in the fabrication of reactor fuel elements for the Hanford, Washington, and Savannah River, South Carolina, reactors.

At the completion of work by the Bridgeport Brass Company, one large extrusion press was shipped to Reactive Metals, Inc., in Ashtabula, Ohio, and put into operation there. All other equipment was dismantled and scrapped; its final disposition is unknown. The Adrian, Michigan, plant was eventually sold to Martin Marietta in the early 1960s and then to GM, Inland Fisher Guide Division, in 1974. No records exist from about 1961 until 1976 to document residual radioactive contamination levels on the floor, walls, fixtures, and structural members of the building or the interim decontamination efforts performed. However, in subsequent surveys residual uranium contamination in excess of applicable standards was found, and further cleanup of the site was determined to be warranted.

3.0 SITE DESCRIPTION

The GM site is located in Lenawee County near Adrian, Michigan, on the eastern side of Route 52. The town of Adrian is approximately 48 km (30 mi) northwest of Toledo, Ohio, and 32 km (20 mi) southwest of Ann Arbor, Michigan (Figure I-1).

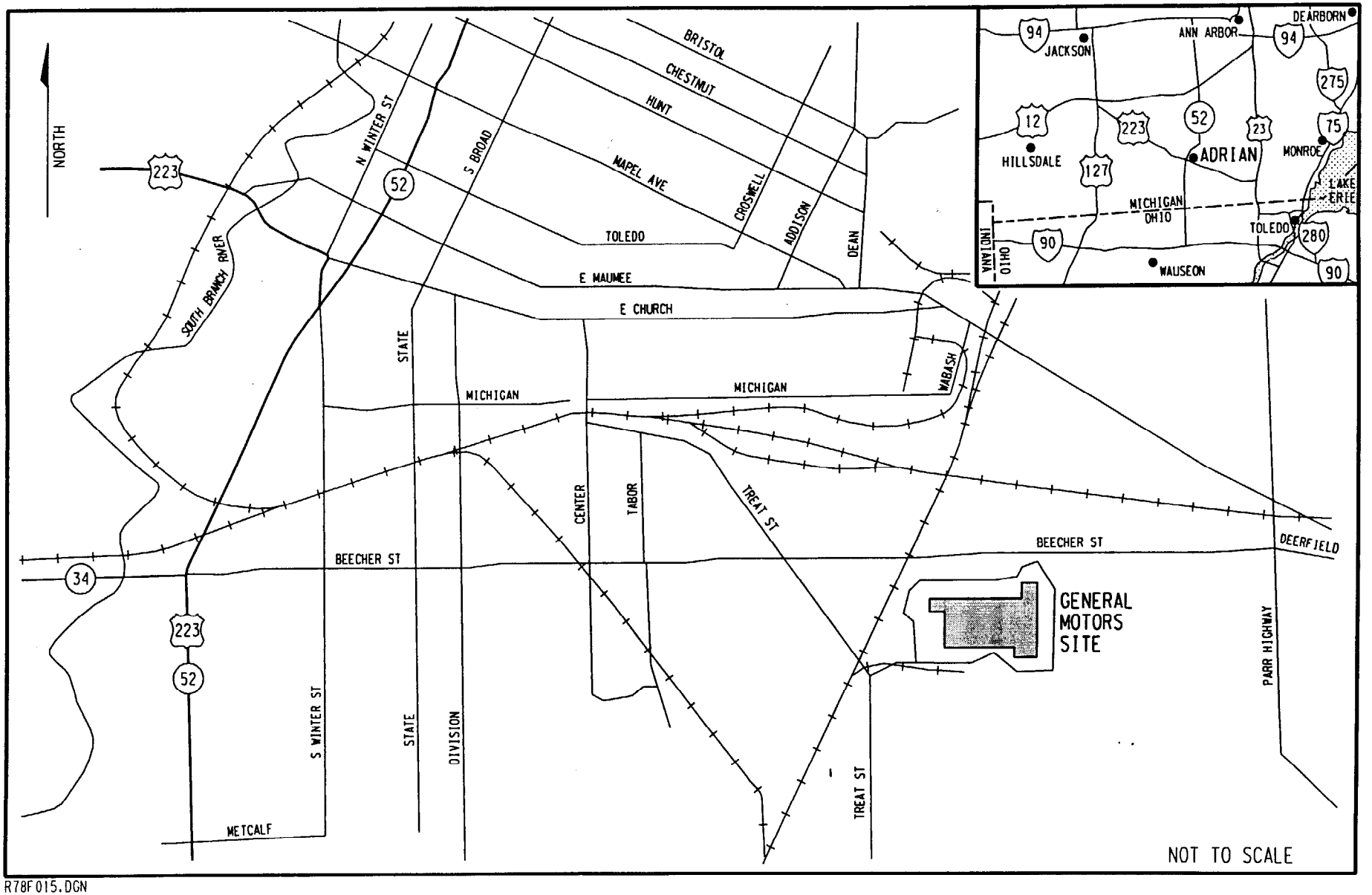

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Figure I-1
General Motors Site Location Map

The GM plant is a large complex covering approximately 7 ha (17 acres); only a portion of this area was used for the uranium extrusion operations (see Figure I-2). The former uranium extrusion process area that required remedial action is approximately 3,800 m^2 (41,000 ft^2) with a ceiling height that varies from 14 to 17 m (45 to 55 ft). Lighting is provided by several rows of fluorescent fixtures and by sunlight through windows in two 10-ft-high (30-m-high) "monitors" (raised sections of the roof that contain rows of windows). The large open areas of this structure are afforded by a massive steel framework. Supported from this frame are crane rails, roofing, electrical conduits, water pipes, space heaters, and exhaust ducts.

The floor drain system shown in Figure I-3 was designated for remedial action at the GM site because residual radioactivity exceeded the guidelines of DOE Order 5400.5. The system contains sumps, electrical manholes, a pipe chase, piping from 3.0 cm (1 in.) to 20.3 cm (8 in.) outer diameter, and electrical conduit in the electrical manholes ranging from 3.8 cm (1.5 in.) to 10.2 cm (4.0 in.) outer diameter.

4.0 RADIOLOGICAL HISTORY AND STATUS

The following sections describe the sequence of events that led to the designation of the property for remedial action under FUSRAP, the radiological guidelines used during the remedial action, and the post-remedial action status.

4.1 RADIOLOGICAL SURVEYS

In May 1976, a report from the General Accounting Office recommended that the U.S. Energy Research and Development Administration (ERDA) expedite completion of radiological surveys at numerous sites throughout the United States, including the GM property in Adrian, Michigan. In response, GM performed an in-house survey of the plant building to determine the need for decontamination activities. Residual uranium contamination exceeding the levels permitted by the NRC and ERDA was found in many places at the site, especially on elevated horizontal surfaces and fixtures and in floor cracks. Equipment stored in these areas was removed, and contaminated areas were decontaminated by GM. Several exhaust ducts in the extrusion and cutting operations areas were found to be contaminated with uranium-238. Concentrations of radioactive materials are typically reported as above-background levels. Levels of uranium-238 were 1.10×10^4 to 2.50×10^4 pCi/g in dust and scale buildup inside the duct); these ducts were subsequently removed and sent for disposal to an offsite location. Results from a follow-up survey performed by GM indicated that the areas surveyed were within the NRC (and ERDA) guidelines. GM then solicited ERDA to perform a survey to verify that the building met current NRC and ERDA guidelines for release of the property for radiologically unrestricted use. In response, ERDA sent a team from Oak Ridge National Laboratory (ORNL) to inspect the facility, make investigative measurements, and conduct a survey if one was warranted.

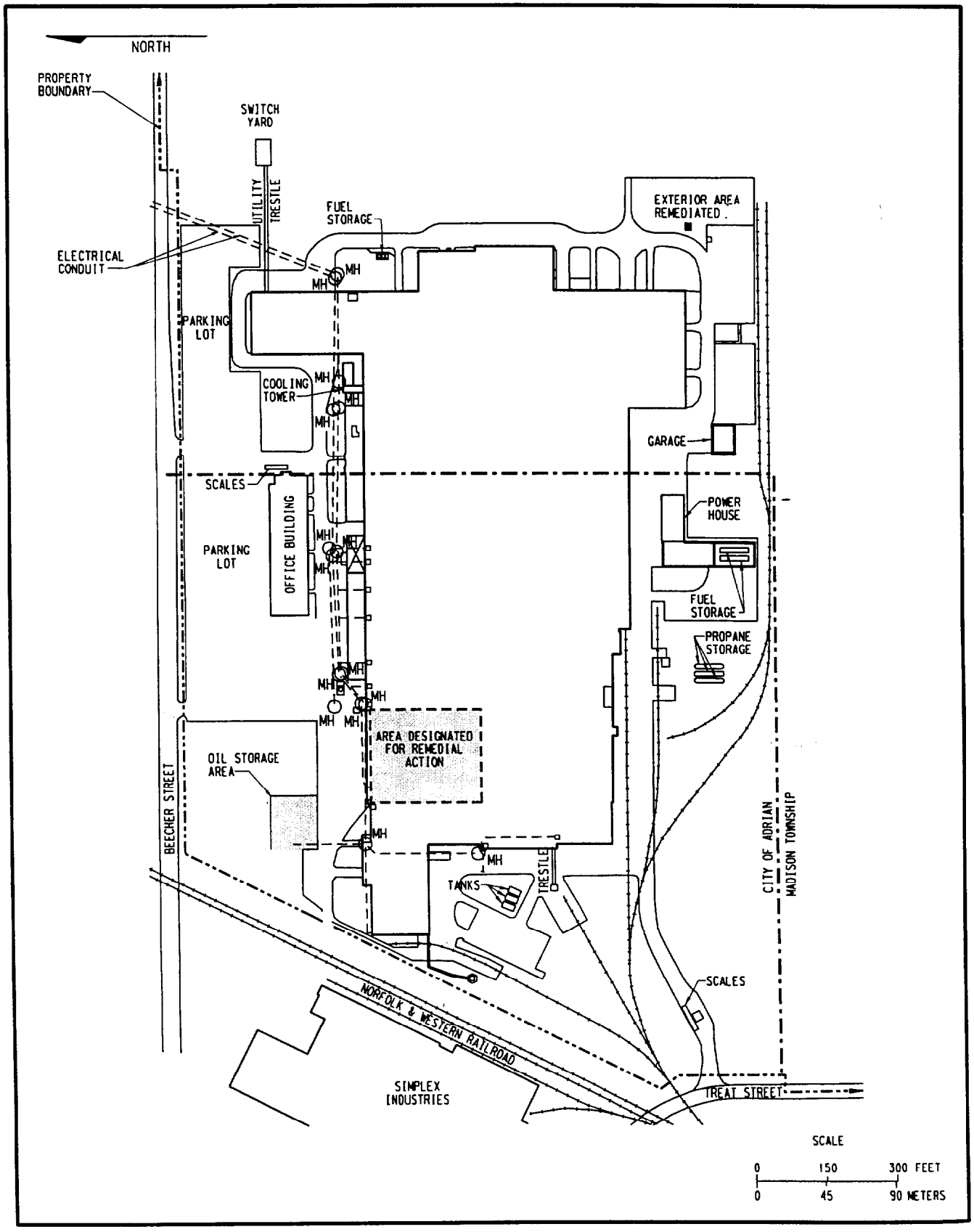

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Figure I-2
General Motors Site Plan

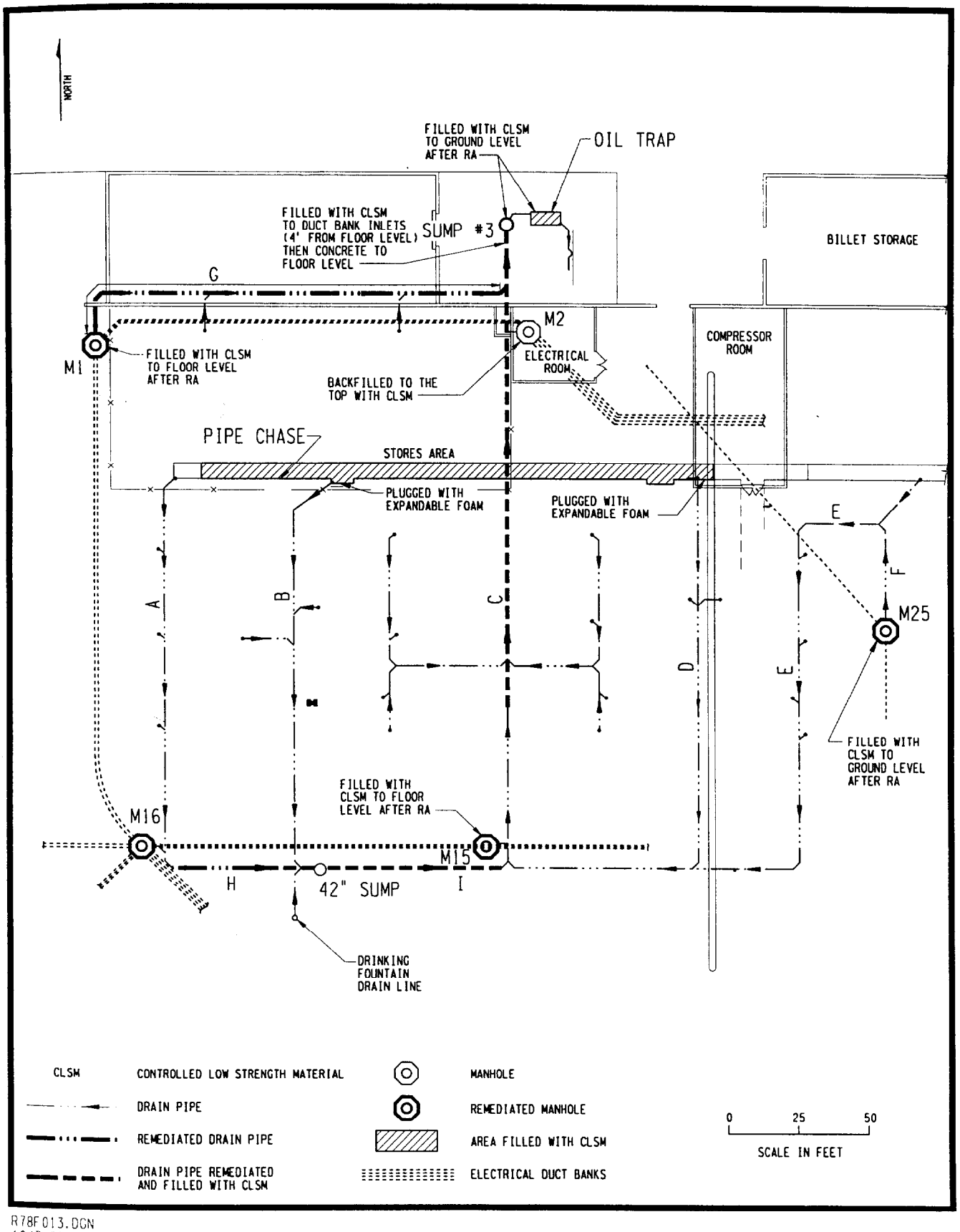

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Figure I-3
Piping System Designated for Remedial Action with Post Remedial Action Status

ORNL conducted the survey in 1977. The surveys included measurements of (1) residual uranium contamination on building surfaces, (2) external gamma exposure rates, (3) airborne radioactivity (radionuclides in high-volume air samples), (4) uranium in water, sediments, and sludge in underground sumps and drains, and (5) uranium-238, radium-226, and thorium-232 in samples of soil from onsite locations. All areas of the floor and overhead structural members were found to be within NRC and ERDA guidelines for radioactive contamination. However, some areas underneath the floor (service pits, manholes, holding tanks, drainlines, and sumps, as shown in Figure I-4) were found to contain concentrations of uranium exceeding guidelines (Ref. 2). These service pits were filled with sand and covered with concrete to form the current floor surface. This survey also included taking smear samples from surfaces and samples of sediment from manholes and tanks. The maximum concentration of uranium-238, 21,000 pCi/g, was found in sludge in the bottom of the 107-cm (42-in.) sump drain line that collects liquid from floor drains in the former uranium extrusion area (Ref. 2). Concentrations of uranium ranged from 20 to 40 pCi/L in oil and from 110 to 350 pCi/g in the scale collected near the top of the sump. An oily sample from the bottom of a drain line in the eastern section of the extrusion area contained uranium-238 concentrations of 4,100 pCi/L. Oily liquid from sump 3 located in the area of the north loading dock contained 9,700 pCi/L of uranium-238. Samples collected from an underground storm drain contained uranium concentrations ranging from 5 to 1,800 pCi/L in water and from 0.1 to 1,500 pCi/g in sludge and sediment. Therefore, remedial action was deemed necessary for the former uranium extrusion area drainage and oil collection system at the GM site.

In 1985, GM installed the currently used manufacturing equipment (extrusion presses, etc.) in the former extrusion area. During construction, a tile drain line was excavated and found to be radioactively contaminated. The portion of the drain line directly under the manufacturing area was removed, placed in four 208-L (55-gal) drums, and shipped to a DOE facility in Oak Ridge, Tennessee, for disposal (Ref. 2).

A team of FUSRAP representatives (including DOE, BNI, and SAIC) visited the plant on June 23-24, 1994, to obtain information regarding the location, extent, and current condition of the manholes, sumps, and drainage system and to conduct radiological investigative surveys for validation of the ORNL data (Ref. 2).

Minimal documentation or evidence was obtained during the June site visit on the extent of the interconnections of the manholes, sumps, and drain lines. Observation and surveying of the manholes and sumps were hindered by the presence of an oily liquid. The radiological survey results from the site visit showed that the manholes, sumps, pipe chase, and the associated piping were contaminated, and survey results were consistent with data presented in the 1982 ORNL report.

4.2 REMEDIAL ACTION GUIDELINES

The source of contamination at the GM site was the machining of natural (neither depleted or enriched) uranium slugs from processed uranium metal. Standards and criteria governing the release of properties for radiologically unrestricted future use are based on DOE Order 5400.5 (Table I-1),

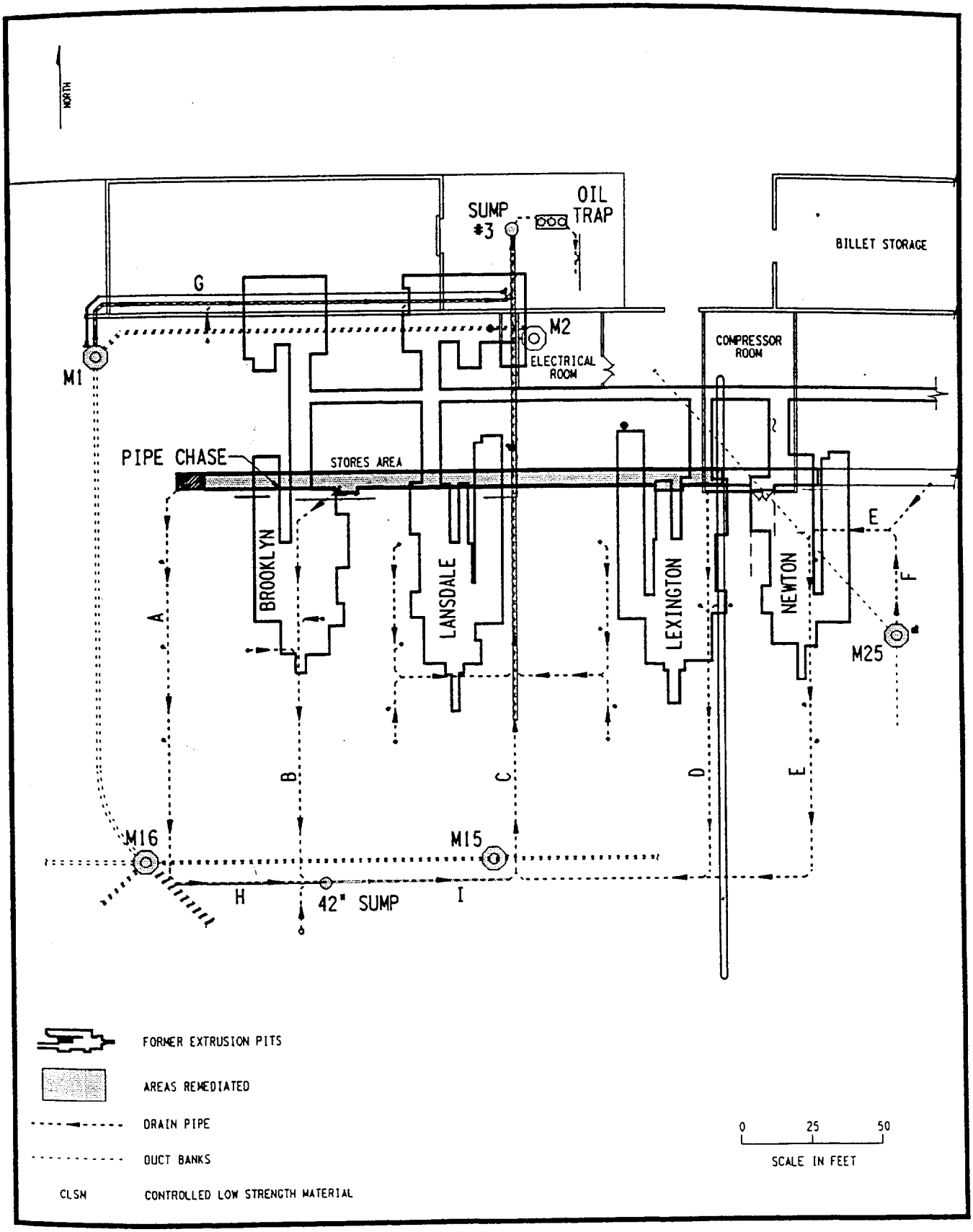

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Figure I-4
Former Extrusion Pit Areas Designated for Remedial Action with Associated Drainage System

Table I-1
Summary of DOE Guidelines for Residual Radioactive Contamination

Basic Dose Limits

The basic limit for the annual radiation dose (excluding radon) received by an individual member of the general public is 100 mrem/yr (DOE Order 5400.5). In implementing this limit, DOE applied as-low-as-reasonably-achievable (ALARA) principles to set site-specific guidelines.

Site Specific Soil Guidelines

The site-specific criterion for soil is 35 pCi/g for total uranium (Ref. 3).

Site Specific Liquid Criterion

The site-specific criterion for oil/water solutions is 300 pCi/L for total uranium (10 CFR 20).

Indoor/Outdoor Structure Surface Contamination

The residual contamination guidelines for fixed and transferable radioactive contamination (dpm/100 cm^2) (DOE 5400.5):

Radionuclide	Average	Maximum	Removable
Uranium-natural, uranium-235, uranium-238, and associated decay products	5,000 (alpha)	15,000 (alpha)	1,000 (alpha)
Beta/gamma emitters (radionuclides with decay modes other than alpha emissions)	5,000 (beta/gamma)	15,000 (beta/gamma)	1,000 (beta/gamma)

"Radiation Protection of the Public and Environment," and are comparable to those currently used by EPA and NRC. The remedial action guidelines for alpha activity from natural uranium, uranium-235, uranium-238, and associated decay products on indoor and outdoor structure surfaces are 5,000 disintegrations per minute per 100 square centimeters (dpm/100 cm^2) averaged over a remediated area of 100 m^2; 15,000 dpm/100 cm^2 (maximum), and 1,000 dpm/100 cm^2 (removable). The site-specific criterion for residual radioactive material in exterior soil removed is 35 pCi/g for total uranium averaged over the remediated area (Ref. 3).

Because only trace concentrations of radium and thorium exist in uranium metal after processing, only extremely low concentrations of these two radionuclides were detected in characterization samples. Only the uranium isotopes contributed significantly to the radioactive contamination at the site.

Oil and asbestos were the only non-radioactive hazardous constituents mingled with residual uranium materials at concentrations requiring remedial action. All oil and asbestos-containing materials (ACM) with residual radioactive substances were removed from the site, solidified, and stabilized, respectively, and transported for disposal at Envirocare of Utah.

The site-specific criterion used at the site for the oil and water, or liquid waste, containing uranium was 300 pCi/L total uranium. This site-specific concentration was established based on the derived concentration guide (DCG) of 600 pCi/L total uranium for discharges of wastewater containing uranium from facilities to surface waters and the NRC concentration limit of 300 pCi/L for natural uranium in liquid effluent discharges to unrestricted areas (10 CFR 20) (Ref. 4). Using the ALARA principle, DOE selected the more restrictive NRC value for use at this site.

4.3 POST-REMEDIAL ACTION STATUS

The post-remedial action survey data indicated that all areas of the GM site determined to be contaminated during characterization surveys are now in compliance with applicable guidelines for cleanup of residual radioactive contamination. Considering a review of post-remedial action measurements, hazard assessment calculations, survey procedures, and quality assurance data, the IVC confirmed that the site was decontaminated to the radiological guidelines established for the site, below the DOE guidelines.

After completing verification activities, the IVC notified DOE, and DOE reviewed the data to determine whether the remedial action was successful. Based on this review, radiological conditions at the site were determined to be in compliance with DOE decontamination criteria and standards to protect health, safety, and the environment.

5.0 SUMMARY OF REMEDIAL ACTION

The following sections describe the remedial action process, actions taken to protect the public and environment, post-remedial action measurements, the verification process, waste management, and costs associated with the release of the property for future use.

5.1 PRE-REMEDIAL ACTION ACTIVITIES

After the appropriate real estate instruments were obtained from the property owners to gain access to the property, but before remedial action began, the contaminated areas were resurveyed. These surveys were performed to more accurately define the boundaries of radioactive contamination above DOE guidelines, to supplement existing characterization information, and to obtain the information necessary to classify the waste to be removed during remediation. In addition, areas that were inaccessible (e.g., plugged and/or buried drainpipes) were surveyed as they became accessible during remedial action.

5.2 DECONTAMINATION ACTIVITIES

During the characterization sampling and surveys at the GM site, concentrations of uranium exceeding the current guidelines were determined to exist in oil, scale, and sludge contained within the pipe chase and oil collection system (including sumps, manholes, and drains) near the area formerly used for uranium metal extrusion operations. All water, oil, sludge, and scale were removed from the sumps and manholes as well as the associated piping to the extent practicable using a high-pressure water wash. Some materials with contamination that exceeded the guidelines but was lower than the basic dose limit were left in place in the piping system because of the high costs of complete remediation and the economic impact that would result from shutting down the GM plant to accomplish the remedial action. A hazard assessment (Ref. 4) concluded that the application of supplemental limits to material left in the piping system would not result in a member of the general public receiving a dose above the DOE primary dose limit of 100 mrem/yr.

To obtain data for the hazard assessment, an innovative technology was applied that deployed a detector using an inverted membrane. The Pipe Explorer™ technology was developed and implemented by the Science and Engineering Associates, Inc. (SEA) group in conjunction with members of DOE, BNI, and TN. A significant savings was realized because of the nondestructive survey methods of the system; no excavation of material was necessary to gain access to the drainage system, and the drainage system could be left in place while measurements were obtained. Appendix I-B contains a detailed description of the technology and its use at the site.

The components remediated at the GM site were the pipe chase, electrical manholes (M1, M2, M15, M16, M25), sump 3, oil trap, a 107-cm (42-in.) sump, and all the accessible associated piping within

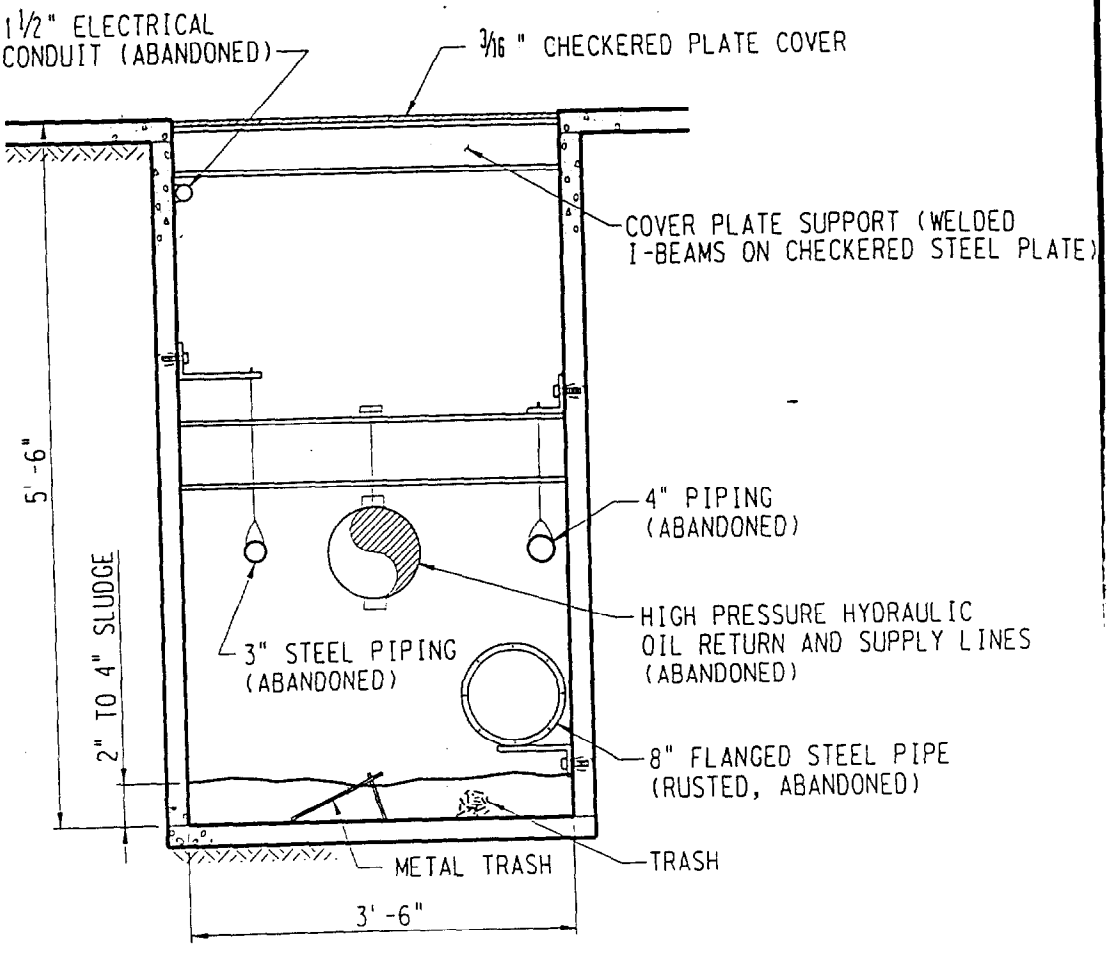
each system (Figure I-4). All sumps and manholes contained an oil/water liquid mix and sludge material that first had to be removed before the decontamination process could be started.

All the oil/water and sludge were removed by pumping the liquids into lined drums; the liquid and sludge were then separated and transferred to storage tanks outside the building (Figure I-2). The liquids were sampled as they were removed and containerized to determine the appropriate treatment and disposal strategies and to measure the uranium concentrations within the sumps and manholes. After the oil/water and sludge had been removed, the trash in the pipe chase, sumps, and manholes was removed to facilitate removal of the scale and decontamination of the walls and floors (Figure I-5). This debris was wiped to remove the oil and scale and was containerized separately for shipment as low-level radioactive waste (LLRW). Before shipment to the commercial disposal facility, the oil and sludge were removed from the storage tanks, placed in lined drums, and solidified to meet disposal facility requirements and land disposal restrictions. The water was filtered and disposed of by a local water treatment/processing facility designed specifically for managing waste waters of various types. The oil/sludge mixture was solidified with cement, rendering the resultant waste non-hazardous. The mixture is thus considered LLRW.

The contaminated inactive lines within the contaminated portion of the pipe chase were cut and wiped to remove the oily film. The decontamination materials were disposed of as LLRW. These pipes varied in size from 2.6 to 20.8 cm (1 to 8 in.) outer diameter. About 30 percent of the pipe hangers and brackets were cleaned and were left in place. Pipe supports were decontaminated and abandoned in place for future use.

The walls and floors of each sump were decontaminated by using a 3,000-psi and a 10,000-psi high-pressure water wash system and wiping with rags. The piping was decontaminated to the extent possible, surveyed, and then plugged and filled with flowable concrete.

Manholes and sumps involved in the remedial action were electrical manholes M1, M15, and sump 3 with the associated oil trap (Figures I-4, I-6, I-8, and I-9), and the 107-cm (42-in.) sump (Figures I-3 and I-7). The manholes were constructed of concrete with drain inlets/outlets and typical duct banks. Some of the cables in the duct banks were insulated with thermal system insulation (TSI), which included ACM. Before oil removal, the TSI was encapsulated with an inert fixative spray to prevent the spread of the material into the liquid and prevent unnecessary personnel exposure. The TSI was then removed from the duct bank entrance, bagged, packaged in accordance with 49 CFR 173.1050 and U.S. Occupational Safety and Health Administration (OSHA) regulations in 29 CFR 1926.1101, and shipped for disposal as LLRW at the commercial disposal facility. The inactive cables were abandoned and left in place. All asbestos work was performed in accordance with applicable OSHA and State of Michigan health standards to prevent exposure to the ACM. After all the oil/water, sludge, and ACM had been removed, the decontamination efforts were completed, and all manholes were filled with flowable concrete or controlled low-strength material (CLSM) up to the cover plate level. The cover plates were embedded in the concrete or CLSM and welded shut.



NOTES:

1. RUST ON ALL COMPONENTS.
2. SEE GENERAL LOCATION ON FIGURE 1-3.

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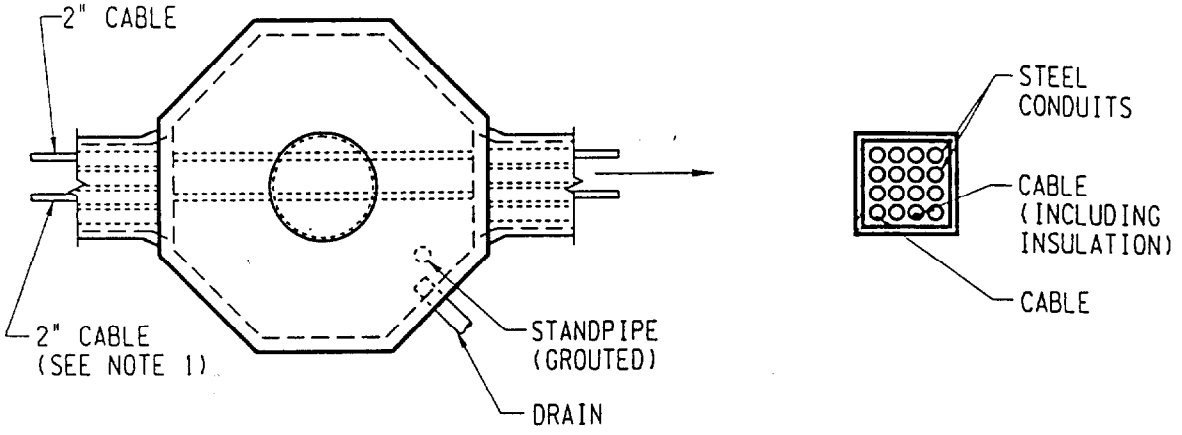
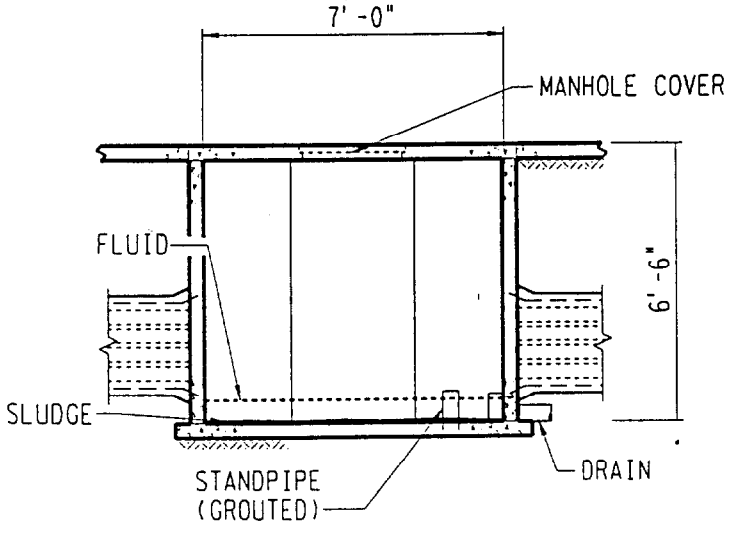
Figure I-5
Typical Section Through Pipe Chase
Before Remedial Action



TOP VIEW - MANHOLE



SIDE VIEW - MANHOLE

NOTES:

1. 2" CABLE IS INSULATED WITH ASBESTOS.
2. SEE GENERAL LOCATION ON FIGURE I-3.

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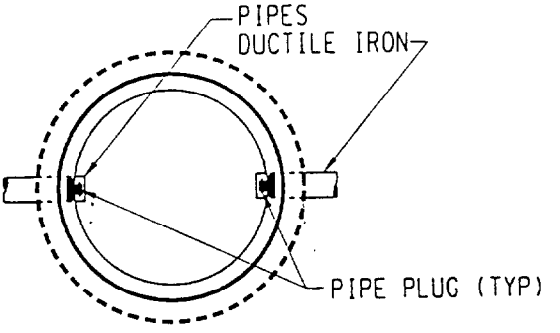
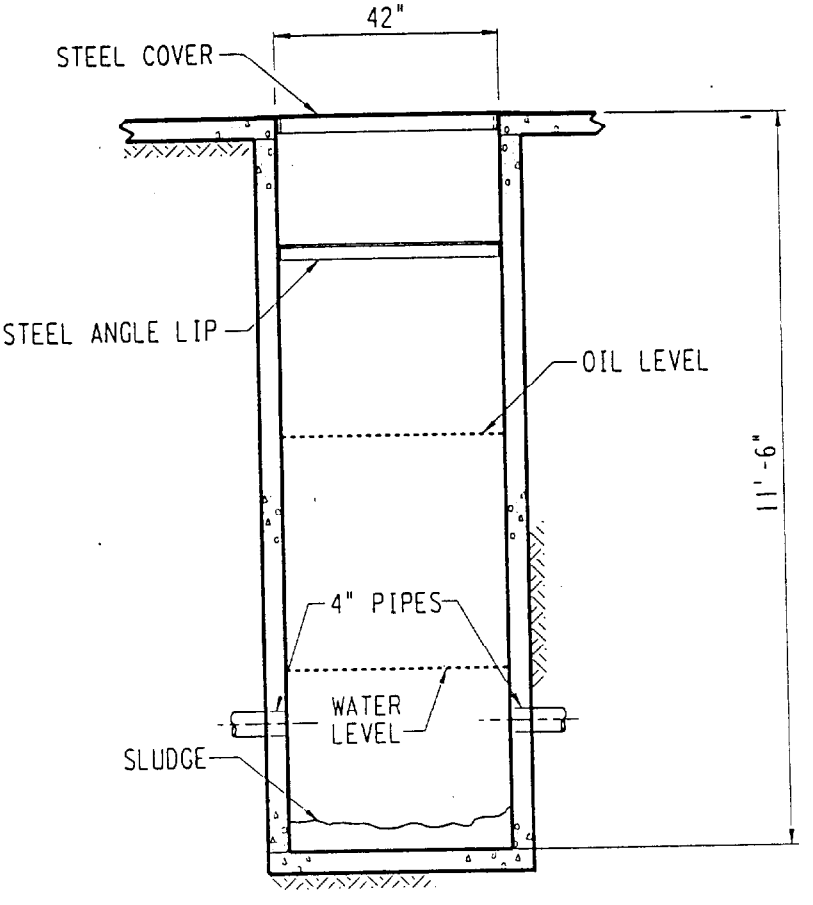
Figure I-6
Typical Manhole Before Remedial Action



TOP VIEW - 42" SUMP
(COVER REMOVED)



SIDE VIEW - 42" SUMP

NOTE:

SEE GENERAL LOCATION ON FIGURE 1-3.

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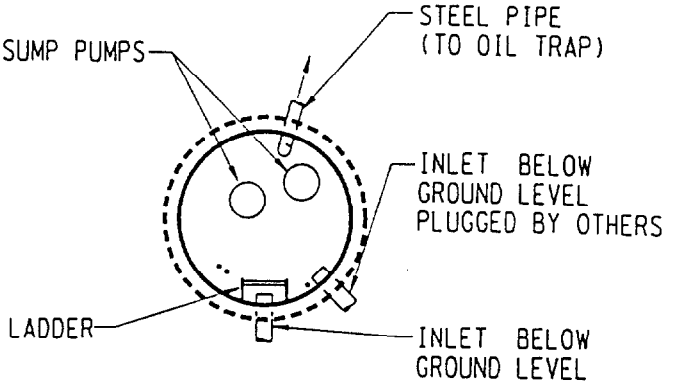
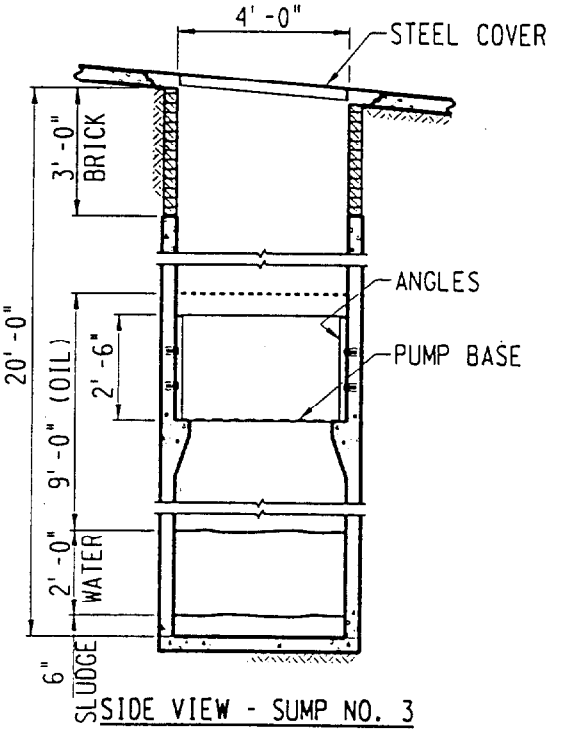
Figure I-7
Forty-Two-Inch Sump Before Remedial Action



TOP VIEW - SUMP NO. 3
(COVER REMOVED)



SIDE VIEW - SUMP NO. 3

NOTES:

1. RUST WAS PREVALENT ON ALL METAL COMPONENTS.
2. BRICK WAS DETERIORATED.
3. STEEL ACCESS LADDER WAS RUSTED.
4. SUMP PUMPS, LADDER, ELECTRICAL CONDUITS WERE NOT SHOWN IN THE SECTION FOR CLARITY.
5. SEE GENERAL LOCATION ON FIGURE I-3.

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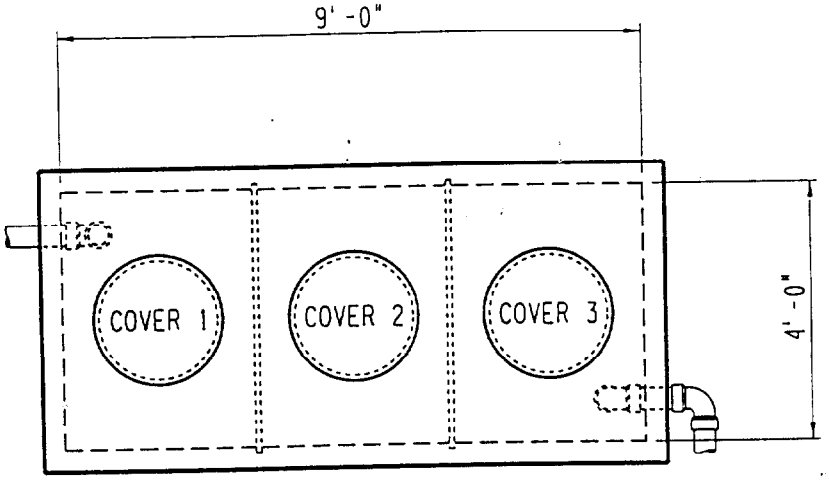
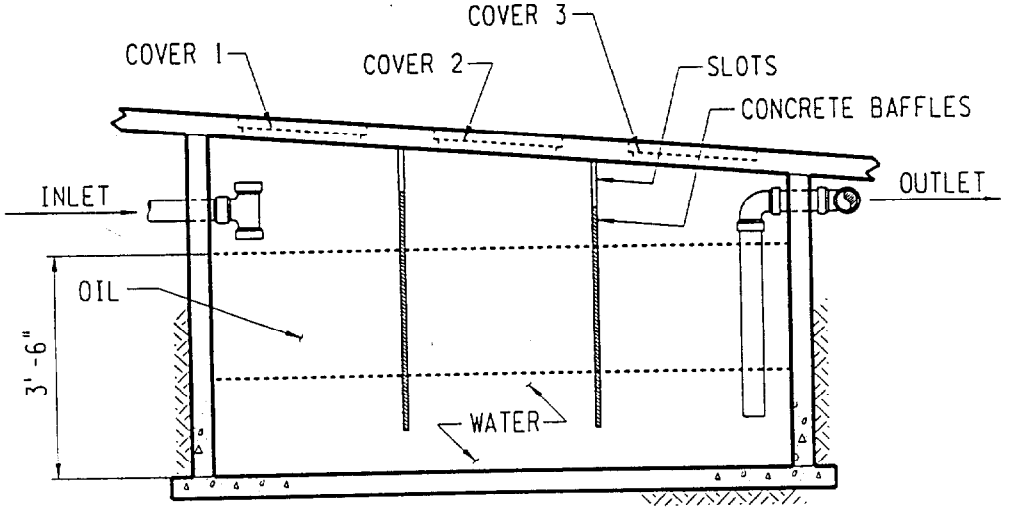
Figure I-8
Sump 3 Before Remedial Action



TOP VIEW - OIL TRAP



SIDE VIEW - OIL TRAP

NOTES:

1. COVER NO. 1 IS GROUTED IN PLACE AND COULD NOT BE OPENED.
2. SEE GENERAL LOCATION ON FIGURE 1-3.

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Figure I-9
Oil Trap Before Remedial Action

For sump 3 (Figure I-8) and the oil trap (Figure I-9), shoring was used to reinforce the brick wall in the top portion. The oil/water was pumped out; sump pumps, the ladder, and electrical items were removed from the sump; and access was gained to the oil trap. The oil trap was decontaminated and filled with CLSM. Sump 3 was filled with a combination of CLSM [from the bottom to the top 1.2 m (4 ft)] and flowable concrete [top 1.2 m (4 ft)]. A detailed description of the piping system post-remedial action status is presented in Table I-2.

One isolated exterior area of contaminated soil, suspected of being a former disposal or experimental area, was present 38.7 m (129 ft) southeast of the main GM building (Figure I-2). This soil was excavated from an area of 0.27 m^2 (3 ft^2) to a depth of 0.6 m (2 ft). Post-remedial action soil samples were then collected from the excavation to verify that the uranium-238 concentration was well below soil guidelines. Results from this sampling showed that the post-remedial action level of uranium-238 was 5 pCi/g total uranium, which is well below the site-specific cleanup limit of 35 pCi/g.

A hazard assessment (Ref. 5) was conducted on the remaining components of the discharge system manholes (M2, M16, and M25) and piping systems. Because these areas were either filled by GM after its purchase of the building in 1974 (M16) or rendered inaccessible (M2 and M25) by placement of heavy machinery or switchgear, attempts to gain normal access would be extremely expensive. The unfilled manholes, M2 and M25, were filled with flowable concrete via their duct banks from other manholes.

The hazard assessment (Ref. 5) evaluated the use of supplemental limits, with current concentrations as inputs, to estimate potential exposures under current and future use. The hazard assessment was designed to evaluate doses to workers and the public from the residual contamination and to assess whether additional remediation was warranted based on costs of further reductions in dose and current and future land uses.

The results of the hazard assessment showed that supplemental limits, as described in DOE Order 5400.5, were warranted for the GM site, so the existing residual uranium concentrations were approved as supplemental limits. Leaving the residual uranium in place for these limited areas will not pose a significant potential future risk, and the cost of removal is very high relative to the long-term benefits that would result.

During the remedial action, engineering controls, administrative controls, and monitoring were used to protect remediation workers and members of the general public from potential exposure to radiation in excess of applicable standards. These controls are outlined in the safety and health instructions for the GM site.

Table I-2

Post-Remedial Action Status of the Piping System at the General Motors Site

Component	As-Built Length m (ft)	Status
Drainline:		
A	37 (120)	Filled
B	37 (120)	Plugged at pipe chase
C	61 (200)	Partially filled
E	52 (170)	Plugged at pipe chase
D	56 (185)	Plugged at pipe chase
F	9 (30)	Plugged at M25
G	44 (145)	Plugged at M1
H	14 (45)	Filled
I	18 (60)	Filled

Note: See Figure I-3.

Component	Status
Sump 3/oil trap:	Backfilled with CLSM. Top 4 ft with concrete.
42-in. sump:	Backfilled with CLSM.
Pipe Chase:	Decontaminated to surface release criteria.
M1:	Backfilled to top with CLSM.
M2:	Backfilled to 4 ft from top with CLSM. Backfilled with concrete to the top.
M15:	Backfilled to top with CLSM.
M16:	Previously filled by GM.
M25:	Backfilled to top with CLSM.

Note: Density of CLSM = 110 lb/ft^3 (1.76 g/cm^3)
Concrete = 150 lb/ft^3 (2.40 g/cm^3)

5.3 POST-REMEDIAL ACTION MEASUREMENTS

Post-remedial action surveys performed by and for the remediation contractor are designed to permit an evaluation of the current radiological status of the property and to allow comparison with guidelines for the release of decontaminated property for radiologically unrestricted future use. Differences in measurement protocol among sites are generally attributable to the type of material handled and the physical form of the contaminants. The measurements listed in this section are those needed to provide an adequate survey of the GM site.

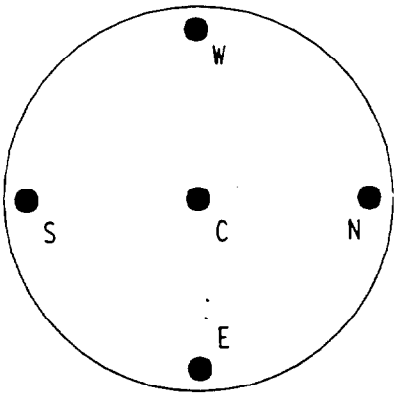
To determine the levels of uranium contamination on surfaces after decontamination, the following surfaces were monitored: walls and floors of sump 3 (Figure I-10); the oil trap associated with sump 3 (Figure I-11); the 42-in. sump; manholes M1 and M15 (Figure I-12); piping associated with the remediated systems; and the exterior area located southeast of the building.

Direct surface contamination is the total amount of radioactive contamination on a surface, including both removable and permanently fixed contamination. To quantify direct surface contamination, radiation detection instrumentation is placed about 1.3 cm (0.5 in.) above the surface to measure the radioactivity emitted from a known surface area. Direct alpha radiation is measured with an alpha scintillation detector connected to a scaler, an instrument that counts the number of radioactive disintegrations (decays) detected in a specified amount of time. Direct beta/gamma radiation measurements are obtained with a Geiger-Mueller probe attached to a scaler. The probe is placed about 1.3 cm (0.5 in.) above the surface to be surveyed, and pulses are allowed to accumulate for one minute on the scaler, resulting in a measurement of counts per minute (cpm) for the surface area. These measurements are then converted, with appropriate calibration and conversion factors, to dpm/100 cm^2, a common unit of measurement in health physics.

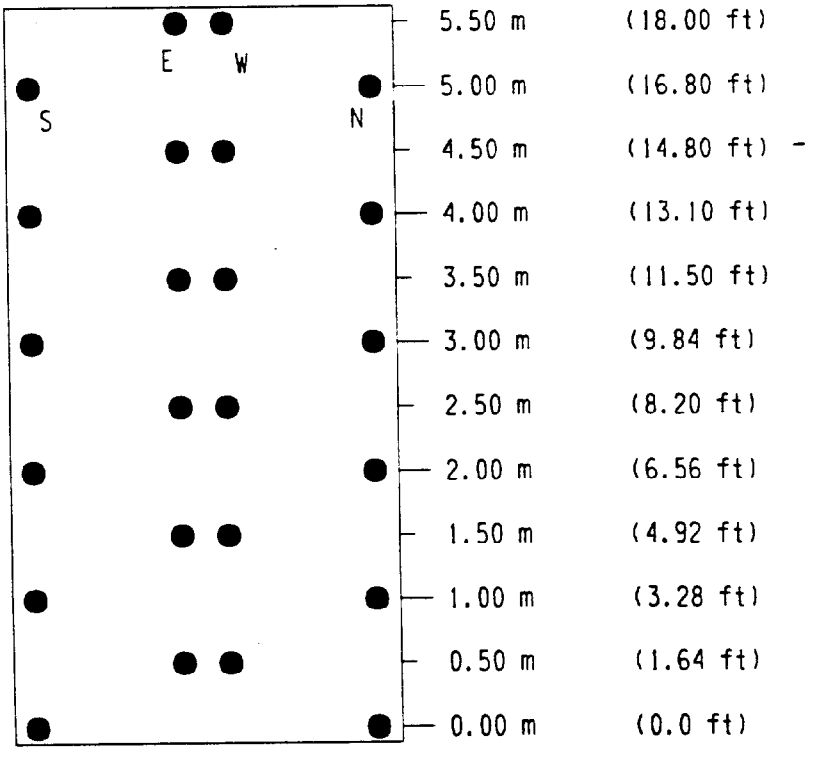
Transferable contamination is the loose radioactive material that can be removed from a surface when it is "swiped" or "smeared" with a soft absorbent paper smear. The smear is placed in a portable smear counter, and alpha and beta/gamma radiation are each counted for one minute. The resulting measurements in cpm are then readily converted to dpm/100 cm^2.

TN provided the analytical functions and health physics services as required to support the remedial action. ORNL performed independent verification surveys of the remediated areas using similar survey techniques. The ORNL survey data and conclusions will be issued as a separate report. When remedial action was completed, the property was restored to a condition agreed upon by DOE and the property owner. Sumps and manholes were backfilled and cover plates welded shut, and all associated piping was plugged or filled.

All personnel working in radioactively contaminated areas were required to wear disposable coveralls, booties, gloves, safety glasses, and hard hats. When conditions warranted, additional protective



FLOOR OF SUMP #3
(TOP VIEW)



WALL OF SUMP #3
(SIDE VIEW)

● SURFACE SURVEY LOCATIONS

NOTE:

SEE TABLE I-3 FOR SUMMARY OF POST-REMEDIAL ACTION RESULTS.

SCALE

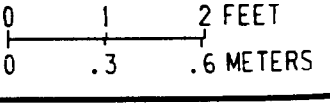


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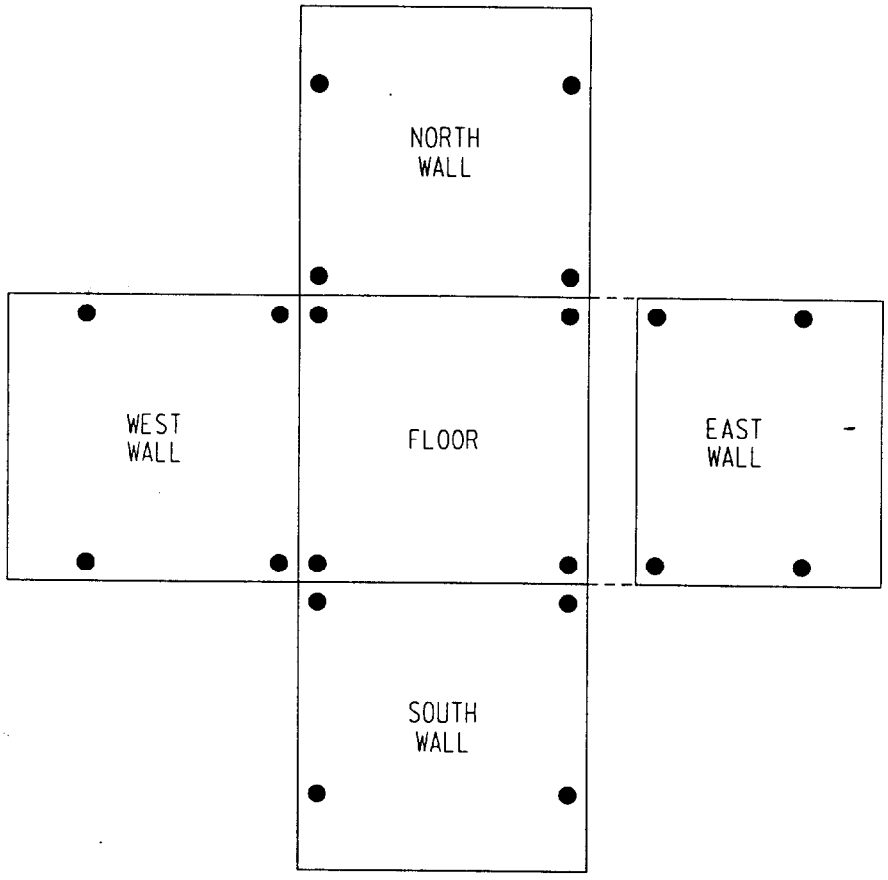
Figure I-10
Post-Remedial Action Survey Locations for Sump 3



EXPLODED VIEW

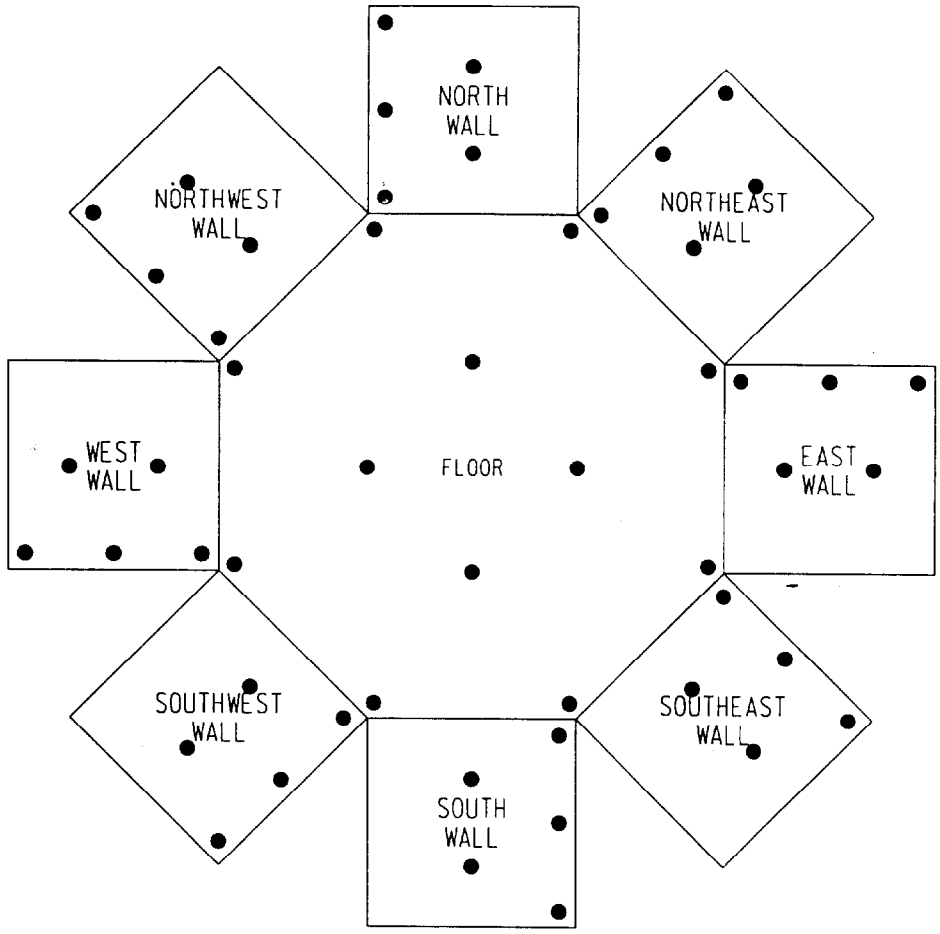
● SURFACE SURVEY LOCATIONS

NOTE:

SEE TABLE I-3 FOR SUMMARY OF
POST-REMEDIAL ACTION SURVEY RESULTS.

SCALE: 3/8" = 1'

Figure I-11
Typical Post-Remedial Action Survey Locations
for Sump 3 Oil Trap



EXPLODED VIEW

● SURFACE SURVEY LOCATIONS

NOTE:

SEE TABLE I-3 FOR SUMMARY OF POST REMEDIAL ACTION SURVEY RESULTS

SCALE: 3/8" = 1'

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Figure I-12
Typical Post Remedial Action Survey Locations
for the Remediated Manholes

clothing and equipment such as hoods and respirators were required, as specified in the safety and health instructions.

Workers exiting radioactively contaminated work areas were subjected to a whole-body scan (frisked) at the control point by a health physics technician with a hand-held radiation detection instrument to ensure that their protective clothing was not contaminated and to prevent the spread of contamination to clean areas. A frisk is simply a search for radioactive material that may have rubbed off onto the clothing of individuals inside the work area. The hand-held radiation detection instrument is held approximately 2.6 cm (1.0 in.) away from the area to be "frisked" and moved slowly [5.2 cm (2 in.) per second] to scan the portion of the body or clothing being monitored. Boots and hands were resurveyed after personnel removed their personal protective equipment (PPE) to ensure that no material was transferred to the individual's personal clothing or skin. Contaminated PPE was sent to Envirocare for disposal as LLRW.

The total exposure to the general public and the work force was minimized by using nondestructive methods of surveying the piping systems and components. An SEA Pipe Explorer™ was used to obtain radioactivity (survey) information on 5.2-cm (2.0-in.) drain lines and electrical duct bank conduits connecting the electrical manholes and sump 3 without using intrusive methods of conventional remedial actions (i.e., excavation, pipe cutting). The Pipe Explorer™ used a pneumatically deployed inverted membrane to send the detector through the system at a constant rate while obtaining real-time data. Therefore, the operator could remain outside the system and obtain the radiological results for the pipe. The only contaminated material resulting from the operation was approximately 0.003 m^3 (0.004 yd^3) of plastic membrane (Appendix I-B).

All removable residual radioactive material above the current guideline was removed from the GM site and properly disposed of at Envirocare of Utah. Post-remedial action direct surface contamination measurements (Tables I-3 and I-4) were used to verify that the residual radioactive material had been reduced to levels within authorized limits or supplemental limits as indicated by the hazard assessment (Ref. 5). Additional details on the methods and procedures of sampling and surveying are provided in the post-remedial action report for the site (Ref. 6).

5.4 VERIFICATION ACTIVITIES

After remedial action activities were completed, the IVC conducted a survey and obtained soil samples to verify that the site was remediated to levels below applicable guidelines. The objective of the independent verification survey was to confirm that surveys, sampling, and analysis conducted during the remedial action process provided an accurate and complete description of the radiological status of the property.

The IVC's activities included reviewing the published radiological survey reports and the post-remedial action report, visually inspecting the site, and performing radiological survey and sampling

Table I-3

Post-Remedial Action Survey Results for Drain Lines at the General Motors Site[a]

Component	Current Levels of Residual Contamination (dpm/100 cm^2)	Average Over Length Surveyed (dpm/100 cm^2)[b]	Status
Drain Line:			
A	Pipe was found to be previously backfilled.	N/A	Filled
B	3,500 - 32,720	7,760	Plugged at pipe chase
C	7,840 - 1,343,631	540,000	Partially filled
D	3,270 - 10,941	1,850	Plugged at pipe chase
E	2,940 - 5,484	2,210	Plugged at pipe chase
F	Pipe inaccessible; no survey conducted	N/A	Plugged at M25
G	3,280 - 3,307	1,110	Plugged at M1
H[c]	36,637 - 6,314,289	361,000	Filled
I[c]	18,668 - 752,077	166,000	Filled

[a]These surveys were conducted by the remedial action contractor.
[b]Average calculations include negative results as zero, and results less than the detection limit (but greater than zero) as the value reported. Thus, in some cases where activity levels are low, it is possible for the calculated average to be less than the MDA (Ref. 4).
[c]These drainlines are associated with the 42-in. sump.

Table I-4

Post-Remedial Action Survey Results for Walls, Floors, and Other Areas at the General Motors Site

Component	Direct Surface Contamination			Transferable Surface Contamination[a]	
	Number of samples	Alpha Range (dpm/100 cm^2)	Beta/Gamma Range (dpm/100 cm^2)	Number of Samples	Beta/Gamma Range (dpm/100 cm^2)
M1					
Walls:					
North	5	61 - 212	-83 - 584	[a]	[a]
Northeast	5	20 - 161	445 - 1,168	1	<-21[b]
East	6	50 - 182	56 - 640	1	<-16
Southeast	5	81 - 192	195 - 862	[a]	[a]
South	5	71 - 222	250 - 862	[a]	[a]
Southwest	5	50 - 212	28 - 695	[a]	[a]
West	5	30 - 313	-83 - 528	1	<-51
Northwest	6	50 - 192	306 - 862	[a]	[a]
Floor:		<-6 - 89	612 - 4,727	2	<-7 - <28
M15					
Walls:					
North	5	-50 - 212	584 - 2,475	1	<16
Northeast	5	-50 - 71	556 - 1,502	1	<-1
East	6	-50 - 141	445 - 2,197	2	<-1 - 59
Southeast	5	-20 - 111	334 - 1,418	2	<4 - 54
South	5	-50 - 121	501 - 3,587	2	<-9 - 29
Southwest	5	-50 - 161	417 - 1,307	1	<-17
West	5	-50 - 252	417 - 945	2	<-38 - 20
Northwest	6	-50 - 202	195 - 4,255	1	83
Floor:	12	81 - 353	1,390 - 13,598	12	<14 - 185
42-in. SUMP					
Walls:	14	69 - 956	<163 - 4,391	14	<-19 - 58
SUMP 3					
Walls:					
North	6	<-4 - 140[b]	729 - 2,609	4	<7 - 41
East	6	53 - 282	1,150 - 5,863	4	<3 - <20
South	6	63 - 140	6,170 - 9,285	4	<-19 - 105
West	6	<15 - 82	701 - 1,066	4	<-27 - 24
Floor	5	<-8 - 258	125 - 215,064	NA	NA

Table I-4 (continued)

Component	Direct Surface Contamination			Transferable Surface Contamination[a]	
	Number of samples	Alpha Range (dpm/100 cm^2)	Beta/Gamma Range (dpm/100 cm^2)	Number of Samples	Beta/Gamma Range (dpm/100 cm^2)
OIL TRAP:					
Hole A:					
Walls:					
North	4	[c]	844 - 63,375	[c]	[c]
East	4	[c]	1,216 - 3,896	[c]	[c]
South	4	[c]	1,588 - 108,933	[c]	[c]
West	5	[c]	1,067 - 4,069	[c]	[c]
Floor	4	[c]	5,246 - 15,341	[c]	[c]
Hole B:					
Walls:					
North	4	[c]	1,017 - 52,308	[c]	[c]
East	4	[c]	1,117 - 26,744	[c]	[c]
South	4	[c]	1,166 - 6,352	[c]	[c]
West	5	[c]	1,638 - 3,524	[c]	[c]
floor	4	[c]	4,067 - 64,909	[c]	[c]
Hole C:					
walls:					
North	4	[c]	1,861 - 8,511	[c]	[c]
East	4	[c]	794 - 7,370	[c]	[c]
South	4	[c]	2,060 - 6,179	[c]	[c]
West	5	[c]	1,638 - 7,618	[c]	[c]
Floor	4	[c]	1,516 - 32,903	[c]	[c]
PIPE CHASE:					
East End:					
Walls:					
North	52	<-8 - 70	<-309 - 1,206[b]	2[a]	<-12 - <5[a]
South	52	<-8 - 97	<-281 - 757		
East	39	2 - 9.7	<84 - 4,628	11[a]	<-25 - <52[a]
Floor	39	<-15 - 51	<-564 - 908		

Table I-4 (continued)

Component	Direct Surface Contamination			Transferable Surface Contamination[a]	
	Number of samples	Alpha Range (dpm/100 cm^2)	Beta/Gamma Range (dpm/100 cm^2)	Number of Samples	Beta/Gamma Range (dpm/100 cm^2)
West End:					
Walls:					
North	44	<-13 - 290	<167 - 2,753	14	<-17 - 75
South	44	<15 - 602	<83 - 3,115	14	<-34 - 114
West	6	<-13 - 25	<222 - 612	[a]	[a]
Floor	33	<6 - 233	<306 - 3,671	21	<-17 - 92
Stores Area:					
Walls:					
North	70	331	2.38×10^3	24	<-29 - 91
South	70	<2 - 324	2.67×10^3	17	<-28 - 79
Floor	56	335	2.16×10^3	22	<-19 - 67
DOE Guidelines:		**5,000**	**5,000 (Average) 15,000 (Maximum)**		**1,000**

[a] Transferable samples taken when direct surface contamination readings exceed the DOE guidelines.
[b] The "<" sign indicates that the measurement was less than the minimum detectable activity (MDA). The "<-" sign indicates that the measurement was less than the MDA and that after background was subtracted the numerical value was negative (i.e., <MDA result minus background >MDA = negative results indicated by "<-").
[c] Pipe Explorer™ readings; capabilities are limited to direct readings only. Alpha detection is currently unavailable.

NOTE: 1. All results include background levels for the Adrian area. The average background gamma radiation exposure rate for the area is 7.0 μR/h. The average total uranium concentration is 1.5 pCi/g. All post-remedial action and hazard assessment measurements were made by the remedial action contractor.
2. Pipe chase area was remediated to DOE Order 5400.5 levels. Remaining areas were remediated to supplemental levels.

activities. The surveys were conducted in accordance with approved verification and certification protocol (Ref. 7). Upon completion of the verification activities, the IVC prepared a verification report and submitted it to DOE (Ref. 8).

5.5 PUBLIC AND OCCUPATIONAL EXPOSURES

During the remedial action, engineering controls, administrative controls, and monitoring were used to protect remediation workers and members of the general public from potential exposure to radiation in excess of applicable standards. These controls are outlined in the safety and health instructions for the site.

All personnel working in radioactively contaminated areas were required to wear disposable coveralls, booties, gloves, safety glasses, and hard hats. When conditions warranted, additional protective clothing and equipment such as hoods and respirators were required, as specified in the health and safety instructions.

Perimeter air particulate sampling was performed adjacent to areas being remediated to document that no airborne particulate matter with levels of radioactivity exceeding current guidelines (DOE Order 5400.5) was released from the site. The DCG limits in DOE Order 5400.5 represent concentrations of radionuclides that would yield an effective dose equivalent of 100 mrem/yr, the basic dose limit, to an individual continuously exposed to the radionuclide by inhalation for an entire year. This guideline was established to protect the general public and the environment against undue risk from radiation. High-volume air samplers were used to collect air samples to determine the air particulate concentration. The samples were accumulated daily and counted after sufficient time was allowed for radon progeny decay. Concentrations of uranium-238 measured by area particulate air samplers ranged from background [3.7×10^{-13} µCi/mL (0.00037 pCi/L)] to 7.8×10^{-13} µCi/mL (0.00078 pCi/L). The DCG is 2.0×10^{-12} µCi/mL (0.0020 pCi/L) for uranium-238 (2.5 times larger than the activity detected at the site).

5.6 WASTE MANAGEMENT

The decontamination of the General Motors site was conducted in a manner that minimized the total waste volume while expediting the remedial action. The waste volume and waste streams from the General Motors site are listed in Table I-5. None of the excavated material was used as fill material; all of it was disposed of as LLRW. The quantity of waste material was minimized by using a Pipe Explorer™ during pipe surveys and using a local water treatment and processing facility for the accumulated water instead of adding an absorbent material and increasing the volume to be shipped as LLRW for disposal at Envirocare of Utah.

The SEA Pipe Explorer™ significantly minimized waste by reducing investigation-derived waste (including PPE and decontamination and other materials) and reducing the volume of waste generated to

Table I-5
REMEDIAL ACTION SUMMARY

WBS 141

SITE Bridgeport Brass Company Special Metals Extrusion Plant site

OWNER General Motors Corporation

SITE ADDRESS 1450 Beecher Street

CITY, STATE Adrian, Michigan

REMEDIATION AUTHORITY

- ☒ NEPA/CERCLA
- ☐ SUPERFUND
- ☐ RCRA

ACTION	DATE	RESPONSIBLE ENTITY	DOCUMENT
DESIGNATION	07-21-88	DOE	Designation/Authorization Report
CHARACTERIZATION	04-01-82	ORNL	Results of Radiological Survey at the Former Bridgeport Brass Company Special Metals Extrusion Plant Site in Adrian, Michigan.
FINAL RA	4/95-7/95	DOE / ORNL / BNI	Post-Remedial Action Report for the General Motors Site in Adrian, Michigan.

TOTAL VOLUME 174 yd^3
To Remain In Situ 0
Volume Reduction 0
Net Disposal 174 yd^3

Documentation Used: Waste shipping record, CCN 133298.

TYPE OF WASTE FOR NET DISPOSAL:

REGULATORY	VOLUME	DISPOSAL SITE
☒ LLRW (solidified sludges and oils)	174 yd^3	Envirocare, Clive, Utah
☐ 11(E)2		
☐ MIXED		
☐ CHEMICAL		
PHYSICAL		
☐ BUILDING RUBBLE		
☐ SOIL		
☒ LIQUID (non-regulated)	6,150 gal water	Environmental Waste Control, Monroe, Michigan
☐ OTHER		

TREATMENT TECHNOLOGIES APPLIED AT THE SITE:
Macroencapsulation and stabilization.

gain access to the piping systems by conventional methods (i.e., excavating to the pipe for surveys and removal).

Use of the Pipe Explorer™ allowed for a hazard assessment encompassing the entire site (most uranium-containing material was found in the piping systems), which significantly reduced the total volume removed from the site and the costs associated with the removal action.

5.7 COSTS

The final cost associated with the remedial action performed at the General Motors site was approximately $1.8 million; itemized costs are presented in Table I-6.

Table I-6
GENERAL MOTORS SITE
TOTAL REMEDIAL ACTION COSTS

Description	Cost
Design Engineering	$ 64,000
Remedial Action Operations	1,102,000
Waste Transport and Disposal	168,000
Final Engineering Reports	42,000
Project Support	425,000
Total	**$1,801,000**

REFERENCES

1. Memorandum from D. Sexton to G. Palau, "Scoping Notice: Former Bridgeport Brass Company Special Metals Extrusion Plant Site, Adrian, Michigan," BNI CCN 127976 (March, 29, 1995).

2. Oak Ridge National Laboratory, *Radiological Survey of the Former Bridgeport Brass Company Special Metals Extrusion Plant, Adrian, Michigan,* DOE/EV-0005/28, ORNL-5713 (April 1982).

3. Telecon from J. Kopotic to A. Williams, "GM Site-Specific Soil Criteria," BNI CCN 127973 (March 6, 1995).

4. Letter from D. Minaar to J. Kopotic, "Comments on the Proposal for Management of Waste Oil Preparatory to Remediation of Uranium Contamination," BNI CCN 126746 (February 17, 1995).

5. DOE, *Hazard Assessment for the General Motors Site, Adrian, Michigan*, DOE/OR/21950-1017, Oak Ridge, Tenn. (June 1996).

6. Bechtel National, Inc. (BNI), *Post-Remedial Action Report for the General Motors Site, Adrian, Michigan*, DOE/OR/21949-397, Oak Ridge, Tenn. (March 1997).

7. DOE, "Verification and Certification Protocol for the Office of Environmental Restoration Formerly Utilized Sites Remedial Action Program and Decontamination and Decommissioning Program," Revision 3, DOE/NRN/VC-9011 (1990).

8. ORNL, "Independent Radiological Verification Survey Results for the Remedial Action Performed a the Former Bridgeport Brass Company Facility, Adrian, MI.," (Draft) ORNL/RASA-96/7.

9. Correspondence from McKenzie to M. Keller, "GM Site - Adrian, Michigan, IVC Concurrence," BN CCN 146534 (September 1996).

10. DOE, *Description of the Formerly Utilized Sites Remedial Action Program,* ORO-777, Oak Ridge, Tenn. (September 1980).

11. DOE, *Design Criteria for Formerly Utilized Sites Remedial Action Program (FUSRAP) and Surplus Facilities Management Program (SFMP),* 14501-00-DC-01, Rev. 2, Oak Ridge, Tenn. (March 1986

12. Letter from J. Kopotic to K. Stange, "Post-RA Survey Results of Exterior Soil Behind Plant," BNI CCN 133557 (August 23, 1995).

13. Letter from J. Kopotic to R. A. Gaede, "General Motors Plant - Cleanup Strategy," BNI CCN 12354 (November 29, 1994).

APPENDIX I-A

DOE ORDER 5400.5, CHAPTER IV
RESIDUAL RADIOACTIVE MATERIAL

CHAPTER IV

RESIDUAL RADIOACTIVE MATERIAL

1. PURPOSE. This chapter presents radiological protection requirements and guidelines for cleanup of residual radioactive material and management of the resulting wastes and residues and release of property. These requirements and guidelines are applicable at the time the property is released. Property subject to these criteria includes, but is not limited to sites identified by the Formerly Utilized Sites Remedial Action Program (FUSRAP) and the Surplus Facilities Management Program (SFMP). The topics covered are basic dose limits, guidelines and authorized limits for allowable levels of residual radioactive material, and control of the radioactive wastes and residues. This chapter does not apply to uranium mill tailings or to properties covered by mandatory legal requirements.

2. IMPLEMENTATION. DOE elements shall develop plans and protocols for the implementation of this guidance. FUSRAP sites shall be identified, characterized, and designated, as such, for remedial action and certified for release. Information on applications of the guidelines and requirements presented herein, including procedures for deriving specific property guidelines for allowable levels of residual radioactive material from basic dose limits, is contained in DOE/CH 8901, "A Manual for Implementing Residual Radioactive Material Guidelines, A Supplement to the U.S. Department of Energy Guidelines for Residual Radioactive Material at FUSRAP and SFMP Sites," June 1989.

   a. Residual Radioactive Material. This chapter provides guidance on radiation protection of the public and the environment from:

      (1) Residual concentrations of radionuclides in soil (for these purposes, soil is defined as unconsolidated earth material, including rubble and debris that might be present in earth material);
      (2) Concentrations of airborne radon decay products;
      (3) External gamma radiation;
      (4) Surface contamination; and
      (5) Radionuclide concentrations in air or water resulting from or associated with any of the above.

   b. Basic Dose Limit. The basic dose limit for doses resulting from exposures to residual radioactive material is a prescribed standard from which limits for quantities that can be monitored and controlled are derived; it is specified in terms of the effective dose equivalent as defined in this Order. The basic dose limits are used for deriving guidelines for residual concentrations of radionuclides in soil. Guidelines for residual concentrations of thorium and radium in soil, concentrations of airborne radon decay products, allowable indoor external gamma radiation levels, and residual surface contamination concentrations are based on existing radiological protection standards (40 CFR Part 192; NRC Regulatory Guide 1.86 and subsequent NRC guidance on residual radioactive material). Derived guidelines or limits based on the basic dose limits for those quantities are used only when the guidelines provided in the existing standards are shown to be inappropriate.

c. Guideline. A guideline for residual radioactive material is a level of radioactive material that is acceptable for use of property without restrictions due to residual radioactive material. Guidelines for residual radioactive material presented herein are of two kinds, generic and specific. The basis for the guidelines is generally a presumed worst-case plausible-use scenario for the property.

(1) Generic guidelines, independent of the property, are taken from existing radiation protection standards. Generic guideline values are presented in this chapter.
(2) Specific property guidelines are derived from basic dose limits using specific property models and data. Procedures and data for deriving specific property guideline values are given by DOE/CH-8901.

d. Authorized Limit. An authorized limit is a level of residual radioactive material that shall not be exceeded if the remedial action is to be considered completed and the property is to be released without restrictions on use due to residual radioactive material.

(1) The authorized limits for a property will include:

(a) Limits for each radionuclide or group of radionuclides, as appropriate, associated with residual radioactive material in soil or in surface contamination of structures and equipment;
(b) Limits for each radionuclide or group of radionuclides, as appropriate, in air or water; and
(c) Where appropriate, a limit on external gamma radiation resulting from the residual material.

(2) Under normal circumstances expected at most properties, authorized limits for residual radioactive material are set equal to, or below, guideline values. Exceptional conditions for which authorized limits might differ from guideline values are specified in paragraphs IV-5 and IV-7.

(3) A property may be released without restrictions if residual radioactive material does not exceed the authorized limits or approved supplemental limits, as defined in paragraph IV.7a, at the time remedial action is completed. DOE actions in regard to restrictions and controls on use of the property shall be governed by provisions in paragraph IV.7b. The applicable controls and restrictions are specified in paragraph IV.6 and IV.7.c.

e. ALARA Applications. The monitoring, cleanup, and control of residual radioactive material are subject to the ALARA policy of this Order. Applications of ALARA policy shall be documented and filed as a permanent record.

3. BASIC DOSE LIMITS.

a. Defining and Determining Dose Limits. The basic public dose limits for exposure to residual radioactive material, in addition to natural occurring "background" exposures, are 100 mrem (1 mSv) effective dose equivalent in a year, as specified in paragraph II.1a.

b. Unusual Circumstances. If, under unusual circumstances, it is impracticable to meet the basic limit based on realistic exposure scenarios, the respective project and/or program office may, pursuant to paragraph II.1a(4), request from EH-1 for a specific

authorization for a temporary dose limit higher than 100 mrem (1 mSv), but not greater than 500 mrem (5 mSv), in a year. Such unusual circumstances may include temporary conditions at a property scheduled for remedial action or following the remedial action. The ALARA process shall apply to the selection of temporary dose limits.

4. GUIDELINES FOR RESIDUAL RADIOACTIVE MATERIAL.

a. Residual Radionuclides in Soil. Generic guidelines for thorium and radium are specified below. Guidelines for residual concentrations of other radionuclides shall be derived from the basic dose limits by means of an environmental pathway analysis using specific property data where available. Procedures for these derivations are given in DOE/CH-8901. Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 m^2.

(1) Hot Spots. If the average concentration in any surface or below-surface area less than or equal to 25 m^2, exceeds the limit or guideline by a factor of $(100/A)^{0.5}$, [where A is the area (in square meters) of the region in which concentrations are elevated], limits for "hot-spots" shall also be developed and applied. Procedures for calculating these hot-spot limits, which depend on the extent of the elevated local concentrations, are given in DOE/CH-8901. In addition, reasonable efforts shall be made to remove any source of radionuclide that exceeds 30 times the appropriate limit for soil, irrespective of the average concentration in the soil.

(2) Generic Guidelines. The generic guidelines for residual concentrations of Ra-226, Ra-228, Th-230, and Th-232 are:

(a) 5 pCi/g, averaged over the first 15 cm of soil below the surface; and
(b) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.

(3) Ingrowth and Mixtures. These guidelines take into account ingrowth of Ra-226 from Th-230 and of Ra-228 from Th-232, and assume secular equilibrium. If both Th-230 and Ra-226 or both Th-232 and Ra-228 are present and not in secular equilibrium, the appropriate guideline is applied as a limit for the radionuclide with the higher concentration. If other mixtures of radionuclides occur, the concentrations of individual radionuclides shall be reduced so that either the dose for the mixtures will not exceed the basic dose limit or the sum of the ratios of the soil concentration of each radionuclide to the allowable limit for that radionuclide will not exceed 1. Explicit formulas for calculating residual concentration guidelines for mixtures are given in DOE/CH-8901.

b. Airborne Radon Decay Products. Generic guidelines for concentrations of airborne radon decay products shall apply to existing occupied or habitable structures on private property that are intended for release without restriction; structures that will be demolished or buried are excluded. The applicable generic guideline (40 CFR Part 192) is: In any occupied or habitable building, the objective of remedial action shall be, and a reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. [A working level (WL) is any combination of short-lived radon decay products in 1 L of air that will result in the ultimate emission of 1.3×10^5 MeV of potential alpha energy.] In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Remedial actions by DOE are not required in order to comply with this guideline

when there is reasonable assurance that residual radioactive material is not the source of the radon concentration.

c. External Gamma Radiation. The average level of gamma radiation inside a building or habitable structure on a site to be released without restrictions shall not exceed the background level by more than 20 μR/h and shall comply with the basic dose limit when an "appropriate-use" scenario is considered. This requirement shall not necessarily apply to structures scheduled for demolition or to buried foundations. External gamma radiation levels on open lands shall also comply with the basic limit and the ALARA process, considering appropriate-use scenarios for the area.

d. Surface Contamination. The generic surface contamination guidelines provided in Figure IV-1 are applicable to existing structures and equipment. These guidelines are generally consistent with standards of the NRC (NRC 1982) and functionally equivalent to Section 4, "Decontamination for Release for Unrestricted Use," of Regulatory Guide 1.86, but apply to nonreactor facilities. These limits apply to both interior equipment and building components that are potentially salvageable or recoverable scrap. If a building is demolished, the guidelines in paragraph IV.6a are applicable to the resulting contamination in the ground.

e. Residual Radionuclides in Air and Water. Residual concentrations of radionuclides in air and water shall be controlled to the required levels shown in paragraph II.1a and as required by other applicable Federal and/or State laws.

5. AUTHORIZED LIMITS FOR RESIDUAL RADIOACTIVE MATERIAL.

a. Establishment of Authorized Limits. The authorized limits for each property shall be set equal to the generic or derived guidelines unless it can be established, on the basis of specific property data (including health, safety, practical, programmatic and socioeconomic considerations), that the guidelines are not appropriate for use at the specific property. The authorized limits shall be established to (1) provide that, at a minimum, the basic dose limits of in paragraph IV.3, will not be exceeded under the "worst-case" or "plausible-use" scenarios, consistent with the procedures and guidance provided in DOE/CH-8901, or (2) be consistent with applicable generic guidelines. The authorized limits shall be consistent with limits and guidelines established by other applicable Federal and State laws. The authorized limits are developed through the project offices in the field and are approved by the Headquarters Program Office.

Figure IV-1

Surface Contamination Guidelines

Radionuclides[2]	*Allowable Total Residual Surface Contamination* (dpm/100 cm^2)[1] Average[3,4]	Maximum[4,5]	Removable[4,6]
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	~~RESERVED~~ *100**	~~RESERVED~~ *300**	~~RESERVED~~ *20**
Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay product, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters(radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.[7]	5,000	15,000	1,000

[1] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[2] Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[3] Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

[4] The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[5] The maximum contamination level applies to an area of not more than 100 cm^2.

[6] The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[7] This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

**Because no values are presented in this order, FUSRAP uses the values shown based on "DOE Guidelines for Residual Radioactive Materials at FUSRAP and Remote SFMP Sites," Revision 2, March 1987 (CCN 046176).*

b. Application of Authorized Limits. Remedial action shall not be considered complete until the residual radioactive material levels comply with the authorized limits, except as authorized pursuant to paragraph IV.7 for special situations where the supplemental limits and exceptions should be considered and it is demonstrated that it is not appropriate to decontaminate the area to the authorized limit or guideline value.

6. CONTROL OF RESIDUAL RADIOACTIVE MATERIAL. Residual radioactive material above the guidelines shall be managed in accordance with Chapter II and the following requirements.

a. Operational and Control Requirements. The operational and control requirements specified in the following Orders shall apply to interim storage, interim management, and long-term management.

(1) DOE 5000.3B, Occurrence Reporting and Processing of Operations Information

(2) DOE 5440.1E, National Environmental Policy Act Compliance Program

(3) DOE 5480.4, Environmental Protection, Safety, and Health Protection Standards

(4) DOE 5482.1B, Environmental, Safety, and Health Appraisal Program

(5) DOE 5483.1A, Occupational Safety and Health Program for DOE Employees at Government-Owned, Contractor-Operated Facilities

(6) DOE 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements

(7) DOE 5820.2A, Radioactive Waste Management.

b. Interim Storage.

(1) Control and stabilization features shall be designed to provide, to the extent reasonably achievable, an effective life of 50 years with a minimum life of at least 25 years.

(2) Controls shall be designed such that Rn-222 concentrations in the atmosphere above facility surfaces or openings in addition to background levels, will not exceed:

(a) 100 pCi/L at any given point;
(b) An annual average concentration of 30 pCi/L over the facility site; and
(c) An annual average concentration of 3 pCi/L at or above any location outside the facility site.
(d) Flux rates from the storage of radon producing wastes shall not exceed 20 pCi/sq.m-sec., as required by 40 CFR Part 61.

(3) Controls shall be designed such that concentrations of radionuclides in the groundwater and quantities of residual radioactive material will not exceed applicable Federal or State standards.

(4) Access to a property and use of onsite material contaminated by residual radioactive material should be controlled through appropriate administrative and physical controls such as those described in 40 CFR Part 192. These control features should be designed to provide, to the extent reasonable, an effective life of at least 25 years.

c. Interim Management.

(1) A property may be maintained under an interim management arrangement when the residual radioactive material exceeds guideline values if the residual radioactive material is in inaccessible locations and would be unreasonably costly to remove provided that administrative controls are established by the responsible authority (Federal, State, or local) to protect members of the public and that such controls are approved by the appropriate Program Secretarial Officer.

(2) The administrative controls include but are not limited to periodic monitoring as appropriate; appropriate shielding; physical barriers to prevent access; and appropriate radiological safety measures during maintenance, renovation, demolition, or other activities that might disturb the residual radioactive material or cause it to migrate.

(3) The owner of the property should be responsible for implementing the administrative controls and the cognizant Federal, State, or local authorities should be responsible for enforcing them.

d. Long-Term Management.

(1) Uranium, Thorium, and Their Decay Products.

(a) Control and stabilization features shall be designed to provide, to the extent reasonably achievable, an effective life of 1,000 years with a minimum life of at least 200 years.

(b) Control and stabilization features shall be designed to limit Rn-222 emanation to the atmosphere from the wastes to less than an annual average release rate of 20 $pCi/m^2/s$ and prevent increases in the annual average Rn-222 concentration at or above any location outside the boundary of the contaminated area by more than 0.5 pCi/L. Field verification of emanation rates shall be in accordance with the requirements of 40 CFR Part 61.

(c) Before any potentially biodegradable contaminated wastes are placed in a long-term management facility, such wastes shall be properly conditioned so that the generation and escape of biogenic gases will not cause the requirement in paragraph IV.6d(1)(b) to be exceeded and that biodegradation within the facility will not result in premature structural failure in violation of the requirements in paragraph IV.6d(1)(a).

(d) Ground water shall be protected in accordance with legally applicable Federal and State standards.

(e) Access to a property and use of onsite material contaminated by residual radioactive material should be controlled through appropriate administrative and

physical controls such as those described in 40 CFR Part 192. These controls should be designed to be effective to the extent reasonable for at least 200 years.

(2) Other Radionuclides. Long-term management of other radionuclides shall be in accordance with Chapters II, III, and IV of DOE 5820.2A, as applicable.

7. SUPPLEMENTAL LIMITS AND EXCEPTIONS. If special specific property circumstances indicate that the guidelines or authorized limits established for a given property are not appropriate for any portion of that property, then the DOE Field Office Manager may request, through the Program Office, that supplemental limits or an exception be applied. The responsible DOE Field Office Manager shall document the decision that the subject guidelines or authorized limits are not appropriate and that the alternative action selected will provide adequate protection, giving due consideration to health and safety, the environment, costs, and public policy considerations. The DOE Field Office Manager shall obtain approval for specific supplemental limits or exceptions from Headquarters as specified in paragraph IV.5, and shall provide to the Headquarters Program Office those materials required by Headquarters for the justification as specified in this paragraph and in the FUSRAP and SFMP protocols and subsequent guidance documents. The DOE Field Office Manager shall also be responsible for coordination with the State and local government regarding the limits or exceptions and associated restrictions as appropriate. In the case of exceptions, the DOE Field Office Manager shall be responsible for coordinating with the State and/or local governments to ensure the adequacy of restrictions or conditions of release and that mechanisms are in place for their enforcement.

a. Supplemental Limits. Any supplemental limits shall achieve the basic dose limits set forth in Chapter II of this Order for both current and potential unrestricted uses of a property. Supplemental limits may be applied to any portion of a property if, on the basis of a specific property analysis, it is demonstrated that

(1) Certain aspects of the property were not considered in the development of the established authorized limits for that property; and

(2) As a result of these certain aspects, the established limits either do not provide adequate protection or are unnecessarily restrictive and costly.

b. Exceptions to the authorized limits defined for a property may be applied to any portion of the property when it is established that the authorized limits cannot reasonably be achieved and that restrictions on use of the property are necessary. It shall be demonstrated that the exception is justified and that the restrictions will protect members of the public within the basic dose limits of this Order and will comply with the requirements for control of residual radioactive material as set forth in paragraph IV.6.

c. Justification for Supplemental Limits and Exceptions. The need for supplemental limits and exceptions shall be documented by the DOE Field Office on a case-by-case basis using specific property data. Every reasonable effort should be made to minimize the use of supplemental limits and exceptions. Examples of specific situations that warrant DOE use of supplemental standards and exceptions are:

(1) Where remedial action would pose a clear and present risk of injury to workers or members of the public, notwithstanding reasonable measures to avoid or reduce risk.

(2) Where remedial action, even after all reasonable mitigative measures have been taken, would produce environmental harm that is clearly excessive compared to the health benefits to persons living on or near affected properties, now or in the future. A clear excess of environmental harm is harm that is long-term, manifest, and grossly disproportionate to health benefits that may reasonably be anticipated.

(3) Where it is determined that the scenarios or assumptions used to establish the authorized limits do not apply to the property or portion of the property identified, or where more appropriate scenarios or assumptions indicate that other limits are applicable or appropriate for protection of the public and the environment.

(4) Where the cost of remedial action for contaminated soil is unreasonably high relative to long-term benefits and where the residual material does not pose a clear present or future risk after taking necessary control measure. The likelihood that buildings will be erected or that people will spend long periods of time at such a property should be considered in evaluating this risk. Remedial action will generally not be necessary where only minor quantities of residual radioactive material are involved or where residual radioactive material occurs in an inaccessible location at which specific property factors limit its hazard and from which it is difficult or costly to remove. Examples include residual radioactive material under hard-surfaced public roads and sidewalks, around public sewer lines, or in fence-post foundations. A specific property analysis shall be provided to establish that the residual radioactive material would not cause an individual to receive a radiation dose in excess of the basic dose limits stated in paragraph IV.3, and a statement specifying the level of residual radioactive material shall be provided to the appropriate State and/or local agencies for appropriate action, e.g., for inclusion in local land records.

(5) Where there is no feasible remedial action.

8. SOURCES.

a. Basic Dose Limits. Dosimetry model and dose limits are defined in Chapter II of this Order.

b. Generic Guidelines for Residual Radioactive Material. Residual concentrations of radium and thorium in soil are defined in 40 CFR Part 192. Airborne radon decay products are also defined in 40 CFR Part 192, as are guidelines for external gamma radiation. The surface contamination definition is adapted from NRC (1982).

c. Control of Radioactive Wastes and Residues. Interim storage is guided by this Order and DOE 5820.2A. Long-term management is guided by this Order, 40 CFR Part 192, and DOE 5820.2A.

APPENDIX I-B

THE PIPE EXPLORER™

Characterization Of Radioactive Contamination Inside Pipes With The Pipe Explorer™ System*

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Introduction

The U.S. Department of Energy's nuclear facility decommissioning program needs to characterize radiological contamination inside piping systems before the pipe can be recycled, remediated, or disposed. Historically, this has been attempted using hand held survey instrumentation, surveying only the accessible exterior portions of pipe systems. Difficulty, or inability of measuring threshold surface contamination values, worker exposure, and physical access constraints have limited the effectiveness of this approach. Science and Engineering associates, Inc. under contract with the DOE Morgantown Energy Technology Center has developed and demonstrated the Pipe Explorer™ system, which uses an inverting membrane to transport various characterization sensors into pipes. The basic process involves inverting (turning inside out) a tubular impermeable membrane under air pressure. A characterization sensor is towed down the interior of the pipe by the membrane.

Advantages of this approach include the capability of deploying through constrictions in the pipe, around 90° bends, vertically up and down, and in slippery conditions. Because the detector is transported inside the membrane (which is inexpensive and disposable), it is protected from contamination, which eliminates cross-contamination. Characterization sensors that have been demonstrated with the system thus far include: gamma detectors, beta detectors, video cameras, and pipe locators. Alpha measurement capability is currently under development.

A remotely operable Pipe Explorer™ system has been developed and demonstrated for use in DOE facilities in the decommissioning stage. The system is capable of deployment in pipes as small as 2-inch-diameter and up to 250 feet long. This paper describes the technology and presents measurement results of a field demonstration conducted with the Pipe Explorer™ system at a DOE site. These measurements identify surface activity levels of U-238 contamination as a function of location in drain lines. Cost savings to the DOE of approximately $1.5 million dollars were realized from this one demonstration.

Research sponsored by the U.S. Department of Energy's Morgantown Energy Technology Center, under contract DE-AC21-93MC30172 with Science and Engineering Associates, Inc. 6100 Uptown Blvd. NE, Albuquerque, NM, 87110; telefax: (505) 881-7420
* Patent Pending

Problem

By their nature, the interiors of pipes and ducts are difficult to access. In many cases, even the exteriors are inaccessible. For example, drainlines are buried or encased in concrete and duct work is often elevated or enclosed. To access these structures for characterizations such as radiological surveys, requires significant effort and cost. These costs are further increased if the characterizations are carried out in a radiological control zone, where greater personal protective measures and support crews are required.

Furthermore, for alpha and beta emitting contaminants, such as U-238 and Pu-239, it is necessary to take unobstructed measurements of contaminated surfaces. Thus, external measurements through pipe walls are inadequate and the only way to gather data is to get an instrument inside of the pipe.

Alternative methods to the Pipe Explorer™ system can be used to transport detectors into pipes, such as pipe crawlers and push rods. However, these methods lead to ambiguous results if there is removable contamination present. With nothing to prevent contamination from getting on the detector there is no way to differentiate between contamination on the pipe wall and contamination on the detector.. There are additional limitations associated with these alternative methods. For example, pipe crawlers are typically limited to larger diameter pipes (> 4 inches). They are also cumbersome to operate around elbows and have a difficult time in pipes with slippery surfaces. Push rod methods are limited in length and are often unreliable when trying to get a detector around elbows.

Solution

As a solution to this problem, SEA adapted its inverting membrane technology to transport radiation detectors and other characterization tools into pipes. The system uses an air-tight membrane configured so that when it is pressurized it inverts into a pipe. As it inverts the pressure force on the end of the membrane is adequate to tow a detector around multiple elbows and through several hundred feet of piping. This technology not only provides an effective transportation method for detectors, but it also provides a clean conduit through which the detector can travel.

Technology Description

The primary components of the Pipe Explorer™ technology are illustrated in Figure 1. The heart of the system is an air-tight membrane which is initially spooled inside of a canister. The end of the membrane protruding out of the canister is folded over and attached to a basepipe. When the canister becomes pressurized in this configuration, the air pressure on the membrane causes the membrane to be pulled from the spool. This continues until the membrane is completely off the spool. A characterization tool such as a radiation detector is attached to the end of the membrane and towed into the pipe as the membrane continues to invert. The detector cabling is also towed into the pipe from the spool. To retrieve the system from a pipe, the process is simply reversed, where the cabling, detector, and membrane are wound back onto the spool. The system can thus be used to move a detector freely back and forth through a pipe while the detector output and position are continuously recorded. As a result, the Pipe Explorer™ system provides high resolution analysis of the location of radioactive contamination in pipes.

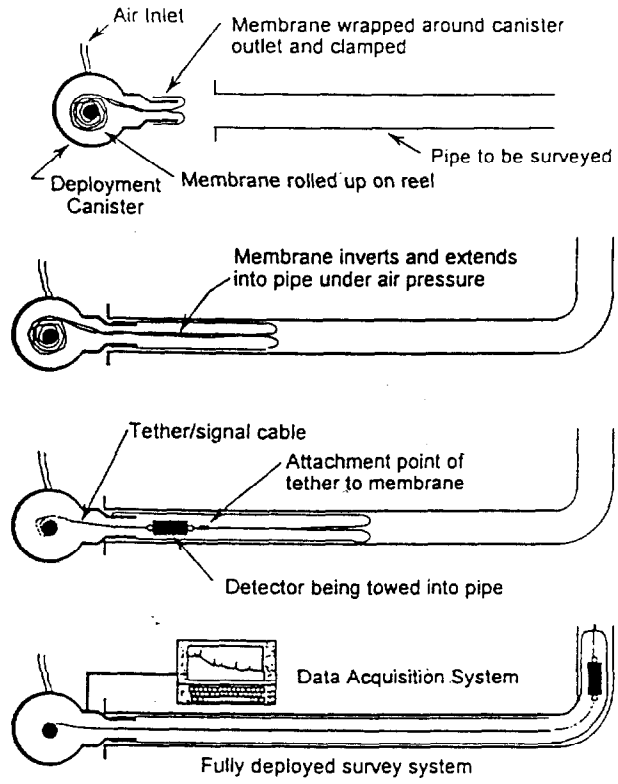


Figure 1. Sequence of membrane and detector deployment with the Pipe Explorer™ system.

The membrane also provides a clean conduit through which the detector travels. This protects both the detector and the workers handling it. Furthermore, measurements are inherently more reliable. A detector transported in any other fashion runs the risk of removable contamination adhering to the sensor, which can cause erroneously high or false positive readings.

The general operating procedure is to first deploy the membrane halfway into the pipe. This is the point where the detector begins to enter the pipe from the deployment canister. At this time data acquisition is initiated. In most cases the detector is deployed out relatively quickly (up to 30-ft/min). More detailed radiological measurements are taken as the detector is retrieved from the pipe at a slower rate.

As the detector is being retrieved, the tether is wound back into the deployment canister. The membrane prevents contamination from contacting the tether. However, as a precautionary measure, two sampling smears are used to swipe the entire surface of the tether and the detector. When the tether is completely retrieved the smears are surveyed with a pancake GM probe to ascertain if any contamination has potentially been transferred into the canister. To date, no contamination of the canister or tether has been noted. Once the detector has been retrieved and the survey completed (the detector can be re-deployed for additional data if needed), the detector is removed from the end of the membrane. The membrane is then fed through a diaphragm to an external reel assembly or manually fed into a disposal drum. The membrane being handled has been inverted. Therefore, the side of the membrane that has been in contact with the contaminated pipe is contained within itself (this is analogous to the way a Hazmat worker removes rubber gloves). The inexpensive membrane (about $0.03/ft) is then disposed. This secondary waste generation is minimal. Several hundred feet of membrane is easily compacted into less than a cubic foot.

Capabilities Summary

The absolute maximum deployable distance of the system is currently limited by the length of cabling and canister size. The current configuration allows for 250-foot deployments. Longer distances may be achievable but no applications to date have required any longer attempts. Practical deployment lengths are limited by elbows in the lines and the diameter of the pipe. Table 1 lists typical results that have been achieved, in laboratory tests, and are used as general guidelines.

The Pipe Explorer™ system has been used to transport several different types of radiological measurement instruments. Table 2 lists these instruments and their descriptions.

SEA currently has two deployment systems available. The first is a fully automated system. With its motorized operation and built in deployment sensors it allows for continual unattended pipe surveys. The second system is a smaller, manually operated system.

Additional uses of the Pipe Explorer™ have been identified and have either been nominally demonstrated or are being integrated with the system. These include;

- Transport of pipe locating beacons
- Transport of video cameras
- Alpha detection methodologies

Table 1. Typical Deployment Lengths and Number of Elbows for Various Pipe Sizes.

Pipe Diameter (inches)	Number of 90° Elbows	Maximum Deployed Distance (feet)
1	0	50
2	2	200
3	4	250
4	4	250

Table 2. Radiological Instruments Used with the Pipe Explorer™ System.

Detector Type	Detection Mode	Notes
Bicron BC-404 Plastic Scintillator 1.25 inch x 1.95 inch	Beta	Large window offers high sensitivity beta detection. Compact package allows transport around 2-inch elbows.
Bicron BC-408 Plastic Scintillator 0.5 inch x 0.5 inch	Beta	Ruggedized packaging good for applications in pipe sizes 3-inches and up.
NaI(Tl) 2-inch x 2-inch crystal size	Gamma	Large crystal provides high sensitivity and good spectral resolution. Larger package size limits applications to pipe sizes greater than 4 inches.
CsI(Na) 1.125-inch x 1.188-inch crystal size	Gamma	Small package allows transport around elbows in 2-inch pipe.

Results

An extensive demonstration of the Pipe Explorer™ was conducted for the DOE Formerly Utilized Sites Remedial Action Program (FUSRAP) at a site in Adrian Michigan. During the 1950's the Bridgeport Brass Company operated a Special Metals Extrusion Plant at the site. This was done under contract with the DOE, then the Atomic Energy Commission. The product of this operation was material for uranium fuel elements for reactors in Hanford, Washington, and the Savannah River Plant in South Carolina. Uranium handled in this operation included depleted, natural, and up to 2.1 percent enriched in U-235. The site is still an active factory where plastic automobile parts, such as door panels and dash-boards, are extruded and finished.

During production of the uranium fuel elements, waste material from the extrusion process mixed with oil from the machinery. This mixture subsequently flowed into the oil drainage system contaminating over 1000 feet of buried drain-lines with varying amounts of uranium tainted oil. In order to quantify the extent and degree of this contamination and to conduct post-remediation measurements, the DOE FUSRAP hosted a demonstration of the Pipe Explorer™ system.

SEA conducted surveys at the site on two separate occasions. The first occurred in April 1995 and the second in May 1995. Thirteen surveys were carried out in eight drain-lines. Several lines were surveyed more than once to confirm success of remedial actions. Two Pipe Explorer™ deployment systems were used with 3 different radiological sensors. The first system used during the April demonstration was a manually operated system. Deployment with this system is controlled by a hand crank. Figure 3 shows the system in operation at the site. With this system, the detector is deployed to a specified location where the position of the detector and its output are recorded by the operator. Figure 4 shows data from one of the surveys conducted with the manually operated Pipe Explorer™ system in conjunction with a beta detector. The data was taken prior to any remedial actions. Thus, the drain-line had a substantial amount of thick oily sludge in it (about the consistency of peanut butter). The detector and its tether were successfully deployed and retrieved with none of the oily contamination coming into contact with the detector, tether, or workers. The data in Figure 4 was obtained with a detector designed and calibrated by the DOE-Grand Junction Projects Office Radon Laboratory (Reference 1).

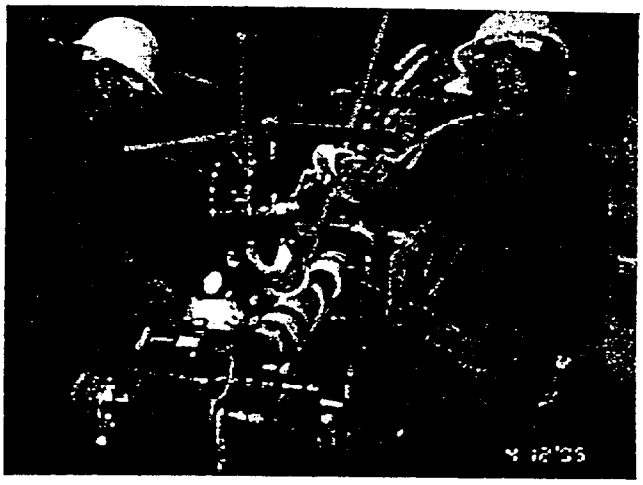


Figure 3. Operation of the Pipe Explorer™ system at the FUSRAP site. The membrane is being retrieved from a drain-line.

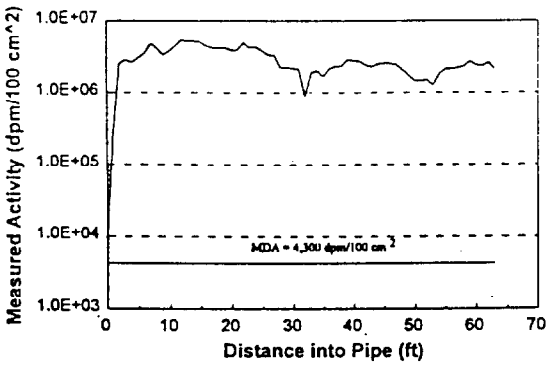


Figure 4. Surface activity measured in a 4-inch drain-line at the FUSRAP site with the manually operated Pipe Explorer™ system. These measurements were taken prior to removal of contaminated sludge from the drain-line.

For the second stage of the demonstration carried out in May 1995, the automated Pipe Explorer™ system was used with a higher sensitivity beta detector. The system canister includes a motorized reel and a deployment distance measurement sensor. Additional sensors in the canister such as a slack indicator, a tension meter, and pressure transducers enable the system to run with minimal operator interaction. All outputs from the sensors are displayed on a control panel. In addition, they are recorded and displayed on a laptop computer acting as a virtual instrument through a LabView® program. The radiological data is also recorded on the laptop so that surface activity as a function of distance into the pipe can be monitored in real time. Figure 5 shows the automated system in use at the FUSRAP site.

A sample of the data obtained with this system is shown in Figure 6. The actual drain-line begins at a distance of 27 feet. Since access to the drain-line was obtained through a deep manhole it was necessary to construct a conduit of this length to guide the membrane to the drain-line entrance. The structure of this data shows the utility of a continuous survey. The data shows a small amount of contamination up to the 40-foot mark in the drain-line. At this point the line intersects another drain-line which had been thoroughly cleaned. After the intersection, however, substantial contamination was encountered. The only exception was a relatively clean section between 90 and 100 feet.

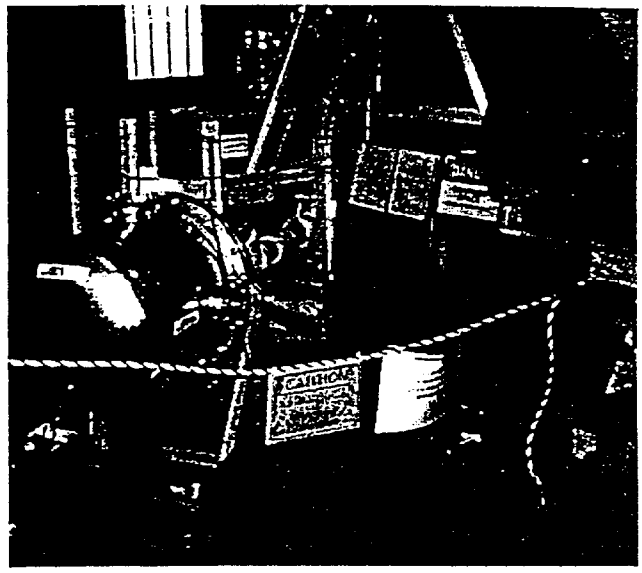


Figure 5. The fully automated Pipe Explorer™ system in use at the FUSRAP site. The deployment canister is on the floor to the left and the operator and control box are on the right. Note that the system is located outside of the radiological control zone.

Confirmation of the Data

Data obtained with the Pipe Explorer™ system at the FUSRAP site was verified with several methods. The first was purely qualitative, where the membrane was visually inspected as it was retrieved from the drain-line. This was useful in such instances as shown in Figure 6 where the data showed significant structure. For example, a large amount of the

oily sludge was noted on the portion of the membrane that had traveled 100 to 120 feet into the drain-line. The portion of the membrane around 98 feet had virtually no oil on it, but below 90 feet substantial amounts of the oily sludge were again seen on the membrane.

Another validation method used was to measure the activity of contamination adhering to the membrane as it was being retrieved. Measurements were taken with a conventional pancake GM probe. This data is shown as triangles in Figure 6. The distance accuracy for these measurements is substantially less than the accuracy of the Pipe Explorer™ data (pancake meter data accurate to approximately ±2 feet, Pipe Explorer™ accurate to ±1 inch). Surface activity measured with the Pipe Explorer™ is consistently higher than that measured with the pancake GM probe because the Pipe Explorer™ system measures the contamination in the pipe and the pancake GM probe measures only the contamination that adheres to the external surface of the membrane. Furthermore measurements with the pancake probe are not calibrated for attenuation effects of the membrane, whereas the data obtained by the Pipe Explorer™ system is.

Confirmation of the data was also attempted by pushing a small GM detector into the drain-line. However, contamination adhering to the GM probe assembly tended to obscure the measurement of contamination on the pipe wall.

Detector Calibration

The ideal way to confirm the Pipe Explorer™ system data would have been to excavate a portion of a drain line and have it analyzed. However, the motivation for using the system at the FUSRAP site was to avoid excavating drain-lines. Therefore, confidence in the data was obtained through rigorous calibration of the detector.

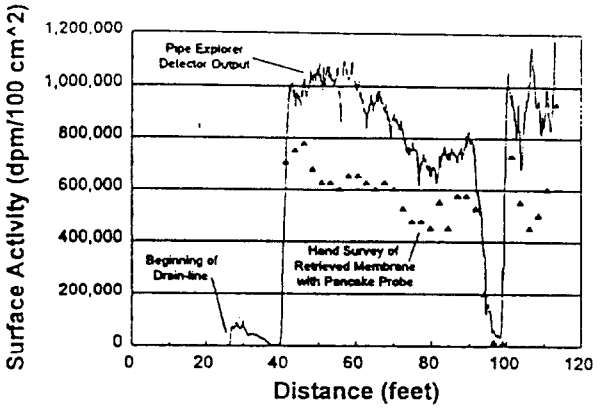


Figure 6. Survey of a drain-line at the FUSRAP site with the automated Pipe Explorer™ system (solid line). Triangular data markers show measurements of contamination on the membrane retrieved from the drain-line.

Detectors used with the Pipe Explorer™ system are specifically calibrated for each use. They are calibrated with an isotope of similar energy of the contaminants that are suspected in a pipe and calibrated in the same measurement geometry. For example, since U-238 was suspected at the FUSRAP site, Sr-90 was used as a calibration source (U-238 is not available in sufficiently high activities for calibrations). The daughter product of Sr-90 (Y-90) emits a beta particle with similar energy as the dominant U-238 daughter product, Pa-234m. The Sr-90 calibration source has an known activity traceable to the National Institute of Standards and Technologies. Using this calibration source results in slightly elevated detection efficiencies because of a lower energy beta emitted by Sr-90 (546 keV max.). This emission is more heavily attenuated by air and the membrane material than the higher energy beta from Y-90, but no effort was made to determine this difference.

The significant added cost of assessing this effect on the calibrations was not deemed necessary, since the error was not considered significant (on the order of 20 percent) and it results in conservative measurements.

The calibrations were carried out to best simulate the measurement conditions that would be encountered at the FUSRAP site, where the detector rests on the bottom of a 4-inch pipe inside of a 4-mil polyethylene membrane. Therefore, all of the calibration measurements were made through a sample of the membrane material in 4-inch pipe. The fundamental procedure used in the calibrations was to move the calibration source to various grid locations surrounding the detector and determine the probe response at each location. The response of the detector to the Sr-90/Y-90 source was integrated over all angular and axial positions to determine detector response to distributed contamination inside of 4-inch pipes. The response of the detector to a check source in a fixed geometry was recorded immediately before and after the detector calibrations. The check source measurement was repeated prior to and after each drain-line survey at the FUSRAP site to verify the detector performance had not changed since the calibrations.

Benefits

The use of the Pipe Explorer offers many technical benefits. These include;

- 100% gamma and beta surveys of pipe interiors, even in buried pipes.
- 100% alpha surveys of pipe interiors (available soon)
- Detector does not become contaminated
- Removable contamination is not spread along pipe.
- Personnel exposure significantly reduced.
- Immediate results.

Technical benefits such as the ones listed above for the Pipe Explorer™ are usually heralded as the pay-off for a DOE investment in a new technology. However, the primary reason the DOE provides funding for development of environmental technologies is so that economic benefits will result through more expedient and cost effective methods. Substantial cost savings have already been realized from use of the Pipe Explorer™ system at the FUSRAP site demonstration. **These cost savings to the DOE are nearly three times the amount invested in the development of the Pipe Explorer™ system.**

The DOE FUSRAP recognized that the cost of excavating buried drain-lines at the site in Adrian MI would be substantial. Therefore, they developed a methodology to avoid these excavation costs. The plan was to verify that activity levels of contamination in the pipes were below a criteria level of $7x10^5$ dpm/100cm^2 (averaged over the length of the drain-lines). It was determined through a hazard assessment that such levels of contamination posed no threat to the general population. Thus, the drain-lines could be left in place after sealing the contamination with grout. If surface activities were found in excess of the criteria level then the drain-lines were to be flushed and cleaned prior to grouting.

The initial method that was used to characterize the drain-line was to insert a small geiger-mueller (GM) detector directly into the drain lines. This was soon found to be an ineffective method because of the abundance of removable contamination present. The contaminated oil would adhere to the detector, making it difficult to differentiate between measurements of contamination on the pipe walls and contamination directly on the detector. In addition, only limited lengths of the drain-lines could be accessed since in many cases the detector could not be shoved around elbows.

The benefits of using the Pipe Explorer™ over direct insertion of a detector were readily seen in surveys of one of the drain-lines. Data initially obtained with the manually operated Pipe Explorer™ system from this drain-line is shown in Figure 6. Activity levels in the pipe were found in excess of the $7x10^5$ dpm/100cm^2 criteria level. The drain-line was then cleaned and a subsequent survey was conducted. Activity levels were found substantially reduced with the exception of a hot spot near the beginning of the drain-line. A detector manually inserted into the pipe would have come into contact with this hot spot and measurements through the rest of the drain-line would have been inaccurately high. Therefore, the Pipe Explorer™ system provided accurate results showing that the drain-line was within the criteria level. Similar results were obtained in the other seven drain-lines surveyed.

Had accurate data not been available from the Pipe Explorer™ system there would have been no way to assess activity levels in the drain-lines. Therefore, it would have been necessary to excavate them. It is estimated that the costs to excavate the drain-lines would have been on the order of $1.2 million (Ref. 2). However, this estimate neglects the fact that the site is an active automotive parts factory. Therefore, costs associated with plant impacts and relocating factory operations should also be included. Factory personnel have good estimates of these costs from prior experiences of modifications to the plant. Their estimate of these costs are about $0.8 million. The cost savings were diminished somewhat by the expense of cleaning the drain-lines and disposing of the waste generated from the cleaning. This cost is estimated at $0.5 million. Therefore, the net savings is estimated to be;

$1.2 +$0.8 -$0.5 = $1.5 million

It is interesting to note that the cost of surveying excavated drain-lines with the Pipe Explorer™ system was included in the excavation cost estimate. This was done since characterization of waste is necessary prior to disposal. Therefore, whether the drain-lines were left in place or excavated, the FUSRAP remediators identified a need for the Pipe Explorer™ system.

Future Activities

The development of the basic Pipe Explorer™ system which includes gamma and beta detection capability is nearing completion. The final aspect of this phase of development is to demonstrate the system at ORNL during October 1995. Video inspection capability of the system will be demonstrated along with radiological surveys.

After this time the system will be available for service work as an inspection tool. A great deal of interest has already been expressed in using the system at;

- Rocky Flats
- Los Alamos National Laboratory
- Sandia National Laboratory
- Other FUSRAP Sites
- and Argonne National Laboratory

In July of 1995 an the development of an enhancement to the system was funded by the DOE METC. This will enable the system to be used for detecting low levels of alpha emitting contaminants such as Pu-239. This will be accomplished by making the inverting membrane component of the system an alpha sensitive scintillator. A photo-detector, towed through the membrane, much the same way as gamma and beta detectors, will quantify activity levels as a function of length over 100% of the internal surface area (for more information see

related paper in these proceedings). After this enhancement is added to the system, complete alpha/beta/gamma surveys will be possible with the Pipe Explorer™ system.

Acknowledgments

SEA wishes to thank Mr. C. Edward Christy of METC for his diligent and enthusiastic support as COR of the Pipe Explorer™ system development. SEA also wishes to thank Mr. Al Tardiff of EM-50 who has helped in finding demonstration sites for the system. We also thank Mr. James D. Kopotic of the FUSRAP for agreeing to host the demonstration of the Pipe Explorer™ system. Finally we wish to thank Mr. Marty Keller and Mr. Gil Drexel of Bechtel along with the site crew at the FUSRAP site who were all extremely helpful in the successful demonstration of the system.

References

1) M.J. Rangel, D. E. Martz, and G. H. Langner, "Gamma and Beta Logging of Underground Sewer and Process Lines," DOE/ID/1584-45, November 1989.
2) FUSRAP Productivity Improvement Program (PIP) Submittal, Bechtel National, Inc, April 1995.

EXHIBIT II

DOCUMENTS SUPPORTING THE CERTIFICATION

OF REMEDIAL ACTION PERFORMED AT THE GENERAL MOTORS SITE

IN ADRIAN, MICHIGAN

1.0 CERTIFICATION PROCESS

The purpose of this certification document is to provide a consolidated and permanent record of the DOE activities leading to the remediation and release of the General Motors site in Adrian, Michigan. A summary of these activities was provided in Exhibit I. Exhibit II contains or cites the letters, memos, reports, and other documents that encompass the entire remedial action process from the initial survey and designation of the site under FUSRAP to certification of the property for release without radiological restrictions.

2.0 SUPPORTING DOCUMENTATION

Each page number begins with the designator "II-" to distinguish the numbering systems used in the supporting documentation that constitutes Exhibit II. These page numbers will be listed in the table of contents at the beginning of this docket and in Sections 2.1 through 2.11. Lengthy documents are incorporated by reference only and are designated as such with the abbreviation "Ref."

The number following the abbreviation "Ref." corresponds to the number in the reference list at the end of Exhibit I.

2.1 DECONTAMINATION OR STABILIZATION CRITERIA

The following documents contain the guidelines that determine the need for remedial action. The General Motors site in Adrian, Michigan, has been decontaminated to comply with these guidelines. The first document listed is included as Appendix A of Exhibit I.

DOE Order 5400.5, *Radiation Protection of the Public and the Environment,* Chapter IV, "Residual Radioactive Material," February 8, 1990.	App. I-A
DOE, *Description of the Formerly Utilized Sites Remedial Action Program*, ORO-777, Oak Ridge, Tenn., September 1980.	Ref. 10
DOE, *Design Criteria for Formerly Utilized Sites Remedial Action Program (FUSRAP) and Surplus Facilities Management Program (SFMP),* 14501-00-DC-01, Rev. 2, Oak Ridge, Tenn., March 1986.	Ref. 11
DOE, *Hazard Assessment for the General Motors Site, Adrian, Michigan*, DOE/OR/21950-1017, Oak Ridge, Tenn. (June 1996).	Ref. 5

2.2 DESIGNATION OR AUTHORIZATION DOCUMENTATION

The following documentation designated or authorized the remedial action at the General Motors site.

Letter from W. R. Voigt, Jr., to J. La Grone, "Designation of the Former Bridgeport Brass Company Site," BNI CCN 054358, December 17, 1985. II-5

memorandum

054358

DATE: DEC 17 1985

REPLY TO ATTN OF: NE-20

SUBJECT: Designation of Sites for Remedial Action - Metal Hydrides, Beverly, MA; Bridgeport Brass, Adrian, MI and Seymour, CT; National Guard Armory, Chicago, IL

TO: Joe LaGrone, Manager
Oak Ridge Operations Office

Based on the attached radiological survey data (Attachments 1 through 3) and an appropriate authority review, the following properties are being authorized for remedial action. It should be noted that the attached survey data are for designation purposes only and that Bechtel National, Inc. (BNI) should conduct appropriate comprehensive characterization studies to determine the extent and magnitude of contamination on these properties.

Site	Location	Priority
Former Bridgeport Brass Co. (General Motors)	Adrian, MI	Low
Former Bridgeport Brass Co. (Seymour Wire Specialty)	Seymour, CT	Low
National Guard Armory	Chicago, IL	Low
Former Metal Hydrides, Inc. (Ventron Div., Thiokol Corp.)	Beverly, MA	Med/Low

At the Bridgeport Brass Sites in Adrian, Michigan, and Seymour, Connecticut, the radioactive material is inaccessible, and if not disturbed, poses no threat to anyone, i.e., in drains, sewers, in concrete covered pits, etc. This being the case, OR/BNI should give serious consideration to leaving the radioactive material in place and arranging for institutional control until modification of the facilities occurs for other reasons. This approach was used for some of the contamination at Gilman Hall, Berkeley, California, and the University of Chicago, Chicago, Illinois. However, there may be other areas of contamination due to Manhattan Engineer District/Atomic Energy Commission activities below the floor at the General Motors plant in Adrian, Michigan, that have not been discovered because there are no as-built drawings or other drawings that show "underground" drains, pits, etc. This possibility should be considered by the BNI staff in planning the characterization survey.

A summary of the Ventron Corporation radiological survey report is attached (Attachment 4). The full report will be sent to you when it is finalized by ORNL. The data in the summary is the radiological basis for conducting remedial action at this facility.

904/2
3.2.3.2

If there are any questions, please call me on FTS 233-4716 or call Arthur Whitman of my staff on FTS 233-5439.

/S/ VOIGT

William R. Voigt, Jr.
Director
Office of Remedial Action
and Waste Technology
Office of Nuclear Energy

NE-23
Whitman
12/16/85

NE-23
DeLaney
12/16/85

NE-20
Baublitz
12/16/85

NE-20
Voigt
12/16/85

Attachments
1. Radiological Survey of the National Guard Armory, Chicago, IL
2. Radiological Survey of the Former Bridgeport Brass Co., Adrian, MI
3. Follow-up Survey of Bridgeport Brass Co., Seymour, CT
4. Preliminary Report of Ventron Site, Beverly, MA

bcc:
E. Keller, OR, w/attach.
B. Berven, ORNL, w/o attach.
J. Berger, ORAU, w/o attach.
A. Whitman, NE-23, w/o attach.
Aerospace, w/o attach.

Baublitz RF
Whitman RF
NEG (4)

NE-23:AWhitman:ph:353-5439:12/16/85:IBM:346/62:3.21.3
3.22
3.7
3.13.4

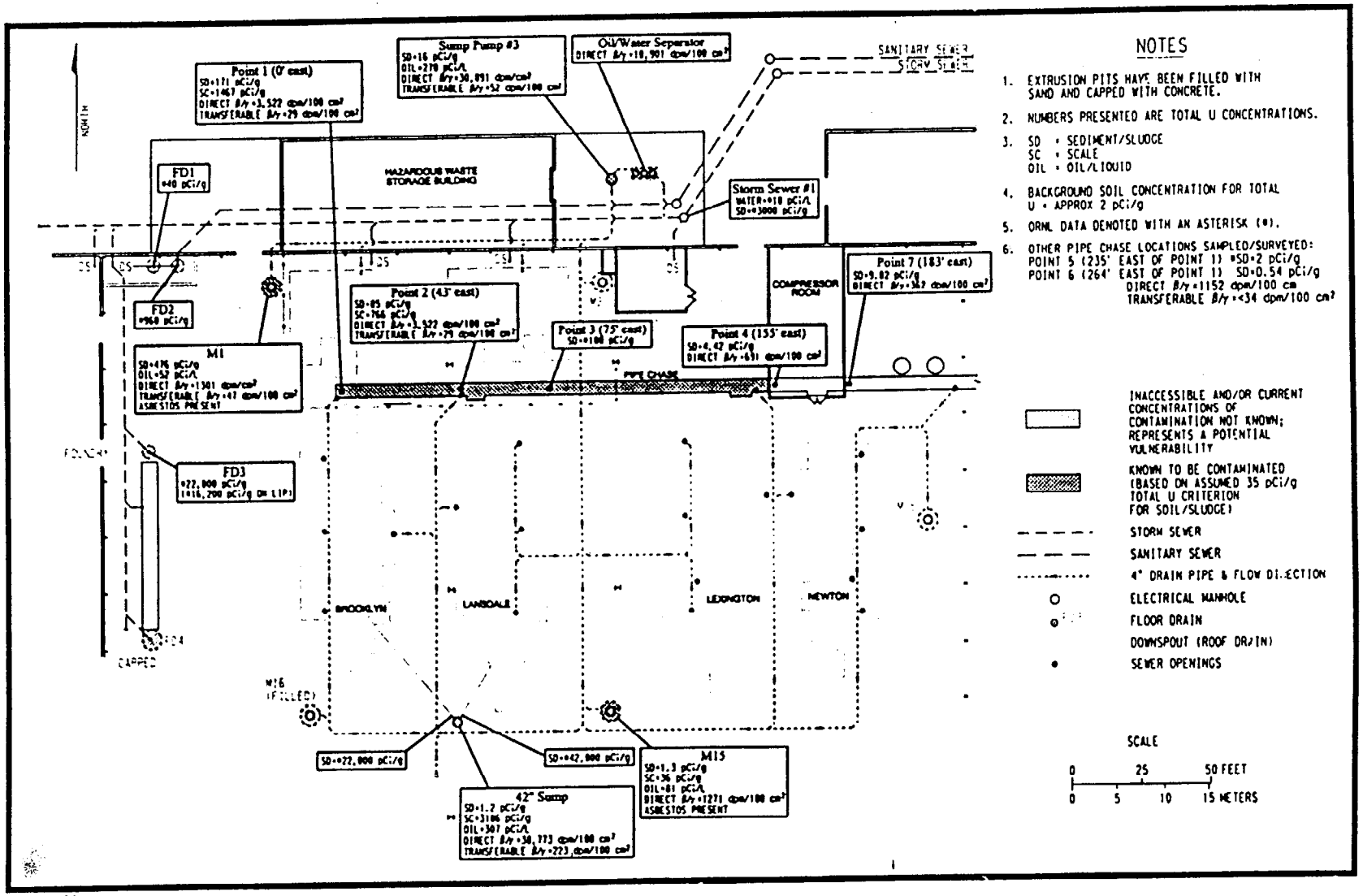
904/3

2.3 RADIOLOGICAL AND CHEMICAL CHARACTERIZATION REPORTS

The pre-remedial status of the General Motors site is described in the following documents.

ORNL, *Radiological Survey at the Former Bridgeport Brass Company Special Metals Extrusion Plant, Adrian, Michigan*, DOE/EV-0005/28, ORNL 5713 (April 1982). Ref. 2

"Radiological Data Summary - Table and Figure," BNI CCN 128119, April 3, 1995. II-8



1415013.CDN

Current Radiological Condition of the Drainage System
at the General Motors Plant, Adrian, Michigan

Summary Data Table for General Motors Radiological Characterization

	Liquid (Bechtel) (Total U pCi/L)	Sludge (Bechtel) (Total U pCi/g)	Scale (Bechtel) (Total U pCi/g)	Solids (ORNL) (Total U pCi/g)	Beta/Gamma Contamination Direct (dpm/100sq.cm.)	Transferrable (dpm/100sq.cm.)	Note
PIPE CHASE							
Point 1 (0' E)	NA	171	1467	1420	3522	<29	Contaminated
Point 2 (43' E)	NA	85	766	1020	12607	195	Contaminated; bottom 50% of wall
Point 3 (75' E)	NA	NA	NA	100	NA	NA	Contaminated
Point 4 (155' E)	NA	4.42	NA	12	691	<24	Clean
Point 7 (183' E)	NA	9.82	NA	NA	362	<49	Clean
Point 5 (235' E)	NA	NA	NA	2	NA	NA	Clean
Point 6 (264' E)	NA	0.54	NA	NA	1152	<34	Clean
ELECTRICAL MANHOLES							
Manhole 1	52	476	NA	7	1301	<47	Contaminated; asbestos present
Manhole 2	NA	NA	NA	NA	NA	NA	Inaccessible
Manhole 15	81	36	1.3	NA	1271	NA	Contaminated; asbestos present
Manhole 16	NA	NA	NA	30000	NA	NA	Filled with sand
Manhole 25	NA	NA	NA	NA	NA	NA	Inaccessible
OIL SUMPS							
42" Sump	307	1.2	3186	42000	38773	223	Contaminated
SumpPump 3	270	16	NA	NA	30891	<52	Contaminated, especially brick
Separator	NA	NA	NA	NA	10901	<5	Contaminated
FLOOR DRAINS							
Floor Drain 1	NA	NA	NA	40	NA	NA	Contaminated based on ORNL
Floor Drain 2	NA	NA	NA	960	NA	NA	results; all Floor Drains appear to be
Floor Drain 3	NA	NA	NA	22000	NA	NA	surfaced over.
STORM SEWER							
Storm Sewer 1	NA	NA	NA	420	NA	NA	Contaminated based on ORNL results; no water or sediment present for sampling in Aug. 1994
Applicable Guideline (*):	600/300	35	35	35	5000	1000	

*35 pCi/g is the assumed volumetric criterion for planning purposes; final determination has NOT been made. Additionally, the DOE DCG for total Uranium (600 pCi/L) is applicable for liquid effluents (oil/water); however, by agreement with GM and the State of Michigan, liquids exceeding 300 pCi/L (total U) will be accepted for disposal.

2.4 ENVIRONMENTAL COMPLIANCE DOCUMENTATION

Documents listed in this section fulfill the NEPA documentation requirements for the General Motors site.

Memorandum from J. La Grone to T. P. Grumbly, "Categorical Exclusion (CX) Determination - Bridgeport Brass Company Site Removal Action," BNI CCN 119788, August 24, 1994. II-11

4931

94 119788

United States Government

Department of Energy

Oak Ridge Operations

memorandum

DATE: August 24, 1994

REPLY TO ATTN OF: EW-93:Hartman

SUBJECT: **CX DETERMINATION - REMOVAL ACTION AT THE GENERAL MOTORS SITE**

TO: Thomas P. Grumbly, Assistant Secretary for Environmental Restoration and Waste Management, EM-1

Attached is a categorical exclusion (CX) determination describing the proposed removal and disposal of radioactively contaminated materials at the General Motors site, Adrian, Michigan. I have determined that this action conforms to an existing National Environmental Policy Act (NEPA) Subpart D CX and may be categorically excluded from further NEPA review and documentation.

This memorandum is a routine notification of a CX determination. The authority for this determination was delegated to the Oak Ridge Operations (ORO) Manager by the Assistant Secretary for Environmental Restoration and Waste Management on December 10, 1991.

If you have any questions concerning NEPA compliance issues, please contact Patricia W. Phillips, ORO NEPA Compliance Officer, at (615) 576-4200.

Joe La Grone
Manager

Attachment

cc w/attachment:
S. C. Golian, EM-22, TREV II
L. E. Harris, EM-431, TREV II
G. S. Hartman, EW-93, ORO
N. Hendrix, EW-91, ORO
J. D. Kopotic, EW-93, ORO
G. L. Palau, BNI
P. W. Phillips, SE-311, ORO
J. Russell, EM-421, BAH, TREV II
R. S. Scott, EM-20, FORS
W. M. Seay, EW-93, ORO
J. D. Waddell, SAIC
J. W. Wagoner II, EM-421, QO

CATEGORICAL EXCLUSION (CX) FOR
REMOVAL ACTION AT THE
GENERAL MOTORS SITE

PROPOSED ACTION: Removal of radioactively contaminated materials at the General Motors site.

LOCATION: General Motors site, Adrian, Michigan [FUSRAP site]. The General Motors site, formerly the Bridgeport Brass Special Metals Extrusion Plant, is located at 1450 Beecher Street, Adrian, Michigan, and is part of DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The site was operated by Bridgeport Brass during the 1950s under contract to the Atomic Energy Commission (AEC) to extrude uranium metal used in the fabrication of nuclear fuel elements for the Hanford, Washington, and Savannah River, South Carolina, reactors.

DESCRIPTION OF PROPOSED ACTION: The proposed action is to safely remove, transport, and dispose of radioactively contaminated materials at the General Motors site and vicinity properties, thereby eliminating potential exposure of workers and the public to contamination exceeding applicable cleanup guidelines. Proposed site activities include, but are not limited to, the following: Excavation of concrete floor areas and subsurface soils; decontamination of structural surfaces in the portion of the main building used for AEC contract work; temporary onsite storage of wastes; packaging, transportation, and disposal of materials at existing appropriately licensed disposal facilities; and disposal of waste/debris below DOE contamination/radiological release guidelines in a commercial disposal facility. In the event that disposal delays require temporary storage of contaminated wastes, storage would be conducted in accordance with all applicable regulations.

The proposed removal action would be conducted under DOE authorities pursuant to the Atomic Energy Act (AEA), would be consistent with the final remedial action for the site, and meets the eligibility criteria for conditions that are integral elements of actions eligible for categorical exclusion as stated in 10 CFR 1021:

1. The proposed action would not threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including requirements of DOE orders. All activities would be managed by FUSRAP.

2. The proposed action would not require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators and facilities for treating wastewater, surface water, and groundwater). Wastes generated during the proposed action would be collected, analyzed to determine waste characteristics, and segregated as they are generated into nonhazardous,

CATEGORICAL EXCLUSION (CX) FOR
REMOVAL ACTION AT THE
GENERAL MOTORS SITE (cont.)

RCRA-only, mixed, and radioactive-only categories. If hazardous wastes are determined to be commingled with radioactive waste, removal and temporary storage would be done in accordance with applicable requirements; the mixed waste would then be disposed of at an existing facility designed to accept these wastes. Wastes would be transported offsite in accordance with applicable transportation and disposal requirements and disposed of at existing facilities or stored temporarily onsite in accordance with applicable requirements pending evaluation of final disposal options. If temporary storage is required, wastes generated from these activities would be managed in accordance with regulations applicable to the types of wastes being managed.

3. The proposed action would not disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases. The removal action would be conducted in an environmentally responsible manner to ensure site-specific control of environmental contamination.

4. The proposed action would not adversely affect any environmentally sensitive resources defined in the Federal Register Notice referenced below, including archaeological or historical sites; potential habitats of endangered or threatened species; floodplains; wetlands; areas having a special designation such as Federally- and state-designated wilderness areas, national parks, national natural landmarks, wild and scenic rivers, state and Federal wildlife refuges, and marine sanctuaries; prime agricultural lands; special sources of water such as sole-source aquifers; and tundra, coral reefs, or rain forests. The proposed action would occur in a previously disturbed/developed area.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal, and the proposal is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

The estimated cost for this action is less than $2 million and would take less than 12 months to complete.

CATEGORICAL EXCLUSION (CX) FOR
REMOVAL ACTION AT THE
GENERAL MOTORS SITE (cont.)

CX TO BE APPLIED: From the DOE NEPA Implementing Procedures, 10 CFR 1021, Subpart D, Appendix B, under actions that "Normally Do Not Require EAs or EISs," "B6.1 Removal actions under CERCLA (including those taken as final response actions and those taken before remedial action) and removal-type actions similar in scope under RCRA and other authorities (including those taken as partial closure actions and those taken before corrective action), including treatment (e.g., incineration), recovery, storage, or disposal of wastes at existing facilities currently handling the type of waste involved in the removal action...."

I have concluded that the proposed action meets the requirements for the CX referenced above. Therefore, I recommend that the proposed action be categorically excluded from further NEPA review and documentation.

James Z. Elmore 8/16/94
for Patricia W. Phillips, ORO NEPA Compliance Officer Date

Based on my review and the recommendation of the ORO NEPA Compliance Officer, I recommend that the proposed action be categorically excluded from further NEPA review and documentation.

Thomas L. Dixon for 8-22-94
Bryan D. Walker, Acting Assistant Manager for Date
Environmental Restoration and Waste Management, ORO

Based on the recommendations of the ORO NEPA Compliance Officer and the Assistant Manager for Environmental Restoration and Waste Management, I determine that the proposed action is categorically excluded from further NEPA review and documentation.

Joe La Grone 8-27-94
Joe La Grone, Manager, DOE Oak Ridge Operations Office Date

119788

United States Government

Department of Energy

Oak Ridge Operations

memorandum

DATE: August 24, 1994

REPLY TO ATTN OF: EW-93:Hartman

SUBJECT: **CX DETERMINATION - REMOVAL ACTION AT THE GENERAL MOTORS SITE**

TO: Thomas P. Grumbly, Assistant Secretary for Environmental Restoration and Waste Management, EM-1

Attached is a categorical exclusion (CX) determination describing the proposed removal and disposal of radioactively contaminated materials at the General Motors site, Adrian, Michigan. I have determined that this action conforms to an existing National Environmental Policy Act (NEPA) Subpart D CX and may be categorically excluded from further NEPA review and documentation.

This memorandum is a routine notification of a CX determination. The authority for this determination was delegated to the Oak Ridge Operations (ORO) Manager by the Assistant Secretary for Environmental Restoration and Waste Management on December 10, 1991.

If you have any questions concerning NEPA compliance issues, please contact Patricia W. Phillips, ORO NEPA Compliance Officer, at (615) 576-4200.

Joe La Grone
Manager

Attachment

cc w/attachment:
S. C. Golian, EM-22, TREV II
E. L. Harris, EM-431, TREV II
G. S. Hartman, EW-93, ORO
N. Hendrix, EW-91, ORO
J. D. Kopotic, EW-93, ORO
G. L. Palau, BNI
P. W. Phillips, SE-311, ORO
J. Russell, EM-421, BAH, TREV II
R. S. Scott, EM-20, FORS
W. M. Seay, EW-93, ORO
J. D. Waddell, SAIC
J. W. Wagoner II, EM-421, QO

EW-93:GSHartman:TJPatterson:6-0723:7/13/94
N:/GSH/GENMOTOR.CX1

DOE F 1325.10 (7-79)

OFFICIAL FILE COPY

CONCURRENCES

RTG SYMBOL	EW-93
INITIALS/SIG.	GSH
	Hartman
DATE	7/13/94
RTG SYMBOL	EW-93
INITIALS/SIG.	
	Price
DATE	7/14/94
RTG SYMBOL	SE-311
INITIALS/SIG.	
	Phillips
DATE	8/16/94
RTG SYMBOL	CC-10
INITIALS/SIG.	
	Bartlett
DATE	8/19/94
RTG SYMBOL	EW-90
INITIALS/SIG.	
	Walker
DATE	8-22-94
RTG SYMBOL	M-3
INITIALS/SIG.	
	Rice
DATE	
RTG SYMBOL	M-2
INITIALS/SIG.	
	Smithwick
DATE	
RTG SYMBOL	M-1
INITIALS/SIG.	
	La Grone
DATE	8/24/94

2.5 REAL ESTATE LICENSES

Fully executed real estate licenses were obtained from the property owner before the remedial action began.

Letter from K. Kates to M. T. Fisher, "Real Estate License for GMO," BNI CCN 119267, August 2, 1994. II-17

Department of Energy
Oak Ridge Field Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

August 2, 1994

Michelle T. Fisher, Counsel
General Motors Corporation
Room 12-149
3044 West Grand Boulevard
Detroit, Michigan 48202

Dear Ms. Fisher:

REAL ESTATE LICENSE REORDOER-7-94-0199, REMEDIAL ACTION AT GM ADRIAN PLANT

Enclosed is a fully-executed copy of the subject license designed to grant the Department of Energy permission to perform remedial action, sampling, and surveys on property owned by the General Motors Corporation - Adrian Plant in Michigan.

As discussed in our telephone conversation on August 1, 1994, the telefaxed instrument was received from you and executed on August 1. The only remaining concern is that there is no Exhibit "A" to attach to the instrument. Were you able to locate a county tax map showing General Motors property? Please let me know and, if you were unable to obtain it, I shall attempt to secure the map.

If you have any questions, please feel free to contact me at 615-576-0977. Thank you again for your early response and for the effort you devoted to completing this action.

Sincerely,

Katy Kates

Katy Kates
Realty Specialist

Enclosure
Real Estate License

cc: Jim Kopotic, DOE
Sally Haywood, Bechtel

119267

REAL ESTATE LICENSE NO.
REORDOER-7-94-0199

DEPARTMENT OF ENERGY

LICENSE

PROJECT: FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM
LOCATION: ADRIAN, MICHIGAN
PURPOSE: REMEDIAL ACTION, SAMPLING, SURVEYS

THIS LICENSE, between General Motors Corporation - Adrian Plant, known as the "Grantor" and the U.S. Department of Energy, known as the "Grantee", is subject to the following terms and conditions.

1. Rights Granted - The Grantor grants to the Grantee, its agents, employees, or representatives permission to use the premises or facilities, together with ingress and egress, for the purpose of removing low-level radioactive material or performing any other reasonable action consistent with the completion of the remedial action, taking soil samples, and conducting follow-up radiological surveys at the location shown depicted on Exhibit "A" attached to this instrument and more specifically identified in whole or in part as Parcel No(s). _____ filed in Deed/Plat Book _____, Page _____ in the records of Lanawee County, Michigan.

2. Term/Termination Rights - This License is valid upon execution by the Grantee and will be effective on the date of execution by the Grantor of this instrument and shall continue in effect for a period of/~~thru~~ two (2) years unless terminated by either of the parties on not less than thirty (30) days prior written notice given to the other; provided, however, that the Grantor may not terminate this License without the Grantee's approval.

3. Consideration - Upon execution of this License by the Grantee, the Grantee shall initiate action to pay to the Grantor the sum of $_____ DELETE _____ as full and complete payment for the rights granted within this License.

4. Authority to License - The Grantor represents and warrants that it is the owner of the property and has full right, power, and authority to enter into this License and grant the rights set out in this License.

DOE-RE FORM 17-FU (12-01-92)

5. Grantor Responsibility - The Grantor responsibility is set out within the terms and conditions of the rights granted under this License. The Grantor makes no representation as to the suitability or fitness of the premises for the intended purpose. Upon certification by the Grantee that the Grantor's property meets all applicable radiological criteria, the Grantor agrees to release the Grantee, its agents, employees, or representatives from all responsibility related to the ~~radioactive contamination and the~~ remedial action covered by this License.

6. Grantee Responsibility - The Grantee, its agents, employees, or representatives will be responsible for property damage or injury to persons caused by the ~~sole and direct~~ negligence of their respective employees in performing on the Grantor's premises the activities and restoration which are the subject of this License. Grantee shall obtain all necessary permits, licenses, and approvals in connection with the activities to be conducted by the Grantee on the premises. During the performance of the activities specified in this License, the Grantee shall not unreasonably interfere with the use and enjoyment of the premises by the Grantor.

7. Access - During the term of this License, the Grantee, its agents, employees, or representatives shall have the right of access to and egress from the premises as needed and shall have the right to bring necessary equipment upon the premises in connection with the performance of the Grantee's activities as set out in Condition 1.

8. Remedial Action - Grantee shall perform removal of low-level radioactive material in accordance with the Remedial Action Plan set forth in Exhibit "B" attached to this instrument. Grantee shall maintain the premises in such a manner as not to create a nuisance or be a hazard to the health, safety, and welfare of the citizens of the State in which the premises are located. Following completion of the remediation action, the Grantee shall restore the premises as set out in Condition 10.

9. Title to Equipment, Fixtures - Title to all equipment, fixtures, appurtenances, and other improvements furnished and/or installed in connection with the Grantee's activities under this License shall remain with the Grantee.

10. Restoration - Upon termination of this License, the Grantee shall remove all its equipment, fixtures, appurtenances, and other improvements furnished and/or installed on the premises in connection with the Grantee's activities under this License. The Grantee shall restore the premises, when such restoration is required in connection with the Grantee's activities, to the extent reasonably practical, to the condition existing at the time of initiation of the Grantee's activites. With the consent of the Grantor, the Grantee may abandon Grantee-owned equipment, fixtures, appurtenances, and other improvements in place in lieu of restoration when it is in the best interests of the Grantee.

11. Successors in Interest - This License and the parties' commitments within, shall be binding on both parties, their successors, and assigns.

12. Funding - Obligations of the Grantee under this License shall be subject to the availability of funds appropriated by the Congress which the Grantee may legally spend for such purposes and nothing in this License implies that Congress will appropriate funds to perform this License.

13. Notices - All notices regarding the specific terms and conditions of this License, and within the restrictions of this License, shall be in writing and shall be deemed effectively given upon personal delivery, upon verified facsimile receipt, or upon mailing by registered or certifed mail, postage prepaid, and addressed to the parties at the following respective addresses, or to such other persons or at such other addresses as may be designated in writing by either party to the other.

If to the Grantee:

Richard P. Nicholson
Realty Officer
Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831

If to the Grantor:

Roger Gaede 517-265-4226
Inland Fisher Guide Division
GMC Adrian Plant
1450 Adrian Plant
Adrian, Michigan 49221

14. Entire Agreement - This License represents the entire understanding of the parties on this matter and no oral statements or collateral documents (except as noted within) may modify this License.

15. Amendment - This License may not be amended or superseded except by an agreement in writing executed by the Grantor and Grantee.

16. Grantee Indemnification - The Grantee shall indemnify and save harmless the Grantor for damages or claims for damages arising out of or in connection with activities of the Grantee, its agents, employees, or representatives related to the rights granted within this License.

That prior to execution of this License certain Conditions were deleted, revised, and/or added (with the additions being as set out below or as designated as Page(s) N/A and being made a part of this License) in the following manner:

Condition No. 3 is deleted in its entirety; Condition No. 17 is added.

17. Timing and Notice - The Grantor and Grantee will consult and mutually agree upon the timing and location of the remedial action work, or portions of work, to be performed. Grantee shall make all reasonable attempts to adhere to agreed upon deadlines for completion of the remedial action work and shall not unreasonably interfere in the production activities of the Grantor. Grantee shall provide reasonable and timely notice to the Grantor of its activities.

The above terms and conditions are acknowledged and agreed upon as indicated by the signatures affixed below:

GRANTOR:	General Motors Corporation - Adrian Plant	GRANTEE:	U.S. Department of Energy
By:	Michelle J. Gosiewski	By:	for Richard P. Nicholson
Title:	Attorney	Title:	Realty Officer
Date:	8-1-94	Date:	8-1-94

DOE-RE FORM 17-FU (12-01-92)

REMEDIAL ACTION PLAN

Radiological surveys have shown that small amounts of low-level radioactive contamination are present on the Grantor's property. The following sequence of remediation operations is anticipated for this property:

1. Radiological measurements to precisely establish and mark contamination limits to guide remediation.

2. Relocation of property items from the affected areas for storage by the Grantor or by the remedial action contractor to an uncontaminated area during the cleanup operations.

3. Excavation of contaminated concrete and soil from the affected areas.

4. Excavation of contaminated material from one or more floor drains.

5. Excavation of contaminated material from one or more floor expansion joints.

6. Excavation of contaminated material from one or more sub-floor sumps.

7. Radiological sampling and analysis to verify that the contamination has been removed.

8. Repair/replace all affected floor drains, floor expansion joints and other affected areas to their original or equivalent condition.

9. Return of previously relocated property items.

10. Storage of containerized contaminated materials resulting from the remedial action at a mutually agreed upon location on the Grantor's property until the materials are shipped offsite for disposal.

EXHIBIT "B"

2.6 POST-REMEDIAL ACTION REPORT

The following document describes the extent of the remedial action and the successful decontamination of the General Motors site.

BNI, *Post-Remedial Action Report for the General Motors Site, Adrian, Michigan*, DOE/OR/21949-397, Oak Ridge, Tenn. (March 1997). Ref. 6

2.7 INTERIM VERIFICATION LETTERS TO PROPERTY OWNERS AND VERIFICATION STATEMENTS AND REPORTS

This section contains the documents related to the successful decontamination of the subject property.

133557 03-448

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831— 8723

August 23, 1995

Mr. Kenneth Stange
18870 Quaker Road
Hudson, Michigan 49247

Dear Mr. Stange:

GENERAL MOTORS SITE - POST REMEDIAL ACTION RESULTS FOR EXTERIOR SOIL BEHIND PLANT AREA, ADRIAN, MICHIGAN

The purpose of this letter is to thank you for the assistance you provided to the Department of Energy (DOE), and to provide you with a summary of the cleanup activities performed as a result of your identification of the suspect area located behind the General Motors plant, Adrian, Michigan.

Upon identification of the suspect area a radiological survey was conducted over the entire area using a Field Instrument for Detection of Low Energy Radiation. This walkover indicated a small area of radioactivity slightly above natural background levels. Soil samples were collected from this area and analyzed to determine the extent of contamination.

The results from these analyses indicated that the area of contaminated soil was approximately three feet in diameter and a little more than one foot in depth. To ensure that the contamination was removed from this area, soil was excavated to a conservative depth of two feet and follow-up samples were collected to ensure the area was clean. The analytical data from the samples revealed that the area had been adequately remediated, in fact the uranium levels were several times lower than the state's standard of 35 picocuries per gram for total uranium. Following our cleanup action, Oak Ridge National Laboratory personnel reviewed the post remediatial action sample results and agreed that the area was clean.

Again, on behalf of DOE's Formerly Utilized Sites Remedial Action Program staff I would like to thank you for giving up your time to identify this area of concern, and for your cooperation in providing valuable information that assisted us with the completion of the clean-up activities at the General Motors site.

Sincerely,

James D. Kopotic

James D. Kopotic, Site Manager
Former Sites Restoration Division

cc: Roger Gaede, GMC
David W. Minnaar, MDPH

2.8 STATE, COUNTY, AND LOCAL COMMENTS ON REMEDIAL ACTION

This section contains correspondence with the state, county, or local governments.

134127

DELPHI
Interior & Lighting Systems

SEP 8 1 27 PM '95

August 31, 1995

Mr. James D. Kopotic
Site Manager
Former Sites Restoration Division
P.O. Box 2001
200 Administration Rd.
Oak Ridge, TN 37831

Dear Mr. Kopotic:

On behalf of Delphi Interior and Lighting- Adrian Operations, I would like to bring to your attention our thoughts about working with Bechtel National Inc. and their subcontractors during the recent uranium remediation efforts undertaken at here at Delphi. The feedback that I received concerning these workers has been positive.

At Delphi, we realize that putting projects ahead of schedule can be difficult, but when this project was re-scheduled, Bechtel personnel performed with great efficiency and were prepared to work under this imposed time constraint. We also appreciate the efforts made by Bechtel to educate our employees of the nature of the work and radiation before remediation measures were taken to assure our workers that they would be in no danger.

A few of Bechtel's notable qualities include: attention to detail, strict adherence to guidelines, and thoroughness. Our engineering staff, especially Roger Gaede, Jeff Cavanaugh, Brian Witkowski, and Joe Kaiser would like to commend Bechtel for their work. We are also aware that the remediation at our plant is one of the few plants in operation virtually 24 hours a day, 7 days a week, however, additional guidelines concerning safety imposed by Delphi were quickly adapted. Key areas in our plant were remediated in time to allow for our own projects to begin and our plant to function effectively.

Sincerely,

MARK A. WINFIELD

Personnel Director

MW/bjw
cc: R. Gaede
J. Cavanaugh

114461

MICHIGAN DEPARTMENT OF STATE

RICHARD H. AUSTIN • SECRETARY OF STATE

LANSING
MICHIGAN 48918

Bureau of Michigan History, State Historic Preservation Office
Michigan Library and Historical Center
717 West Allegan Street
Lansing, Michigan 48918-1800

94 MAR 15 AM 9:03

March 10, 1994

MR JAMES D KOPOTIC SITE MANAGER
FORMER SITES RESTORATION DIVISION
DEPARTMENT OF ENERGY
OAK RIDGE OPERATIONS
P O BOX 2001
OAK RIDGE TN 37831 8723

RE: ER-940291 General Motors Site Clean Up, 1450 Beecher Street, Adrian, Lenawee County (DOE)

Dear Mr. Kopotic:

Under the authority of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited project at the location noted above. It is the opinion of the State Historic Preservation Officer (SHPO) that the project will affect no historic properties (no known sites eligible for listing in the National Register of Historic Places) and that the project is cleared under federal regulation 36 CFR 800 for the "Protection of Historic Properties."

Please maintain a copy of this letter with your environmental review record for this project. If the scope of work changes in any way, or if artifacts or bones are discovered, please contact this office immediately. This letter evidences your compliance with 36 CFR 800.4, "Identifying Historic Properties," and the fulfillment of your responsibility to notify this office under 36 CFR 800.4(d), "When no historic properties found."

If you have any questions, please contact the Environmental Review Coordinator at (517) 335-2721 or 335-2720. Thank you for this opportunity to review and comment.

Sincerely,

Kathryn B. Eckert

Kathryn B. Eckert
State Historic Preservation Officer

KBE:KMW:cm

126746

STATE OF MICHIGAN

JOHN ENGLER, Governor

FEB 24 9 10 AM '95

DEPARTMENT OF PUBLIC HEALTH

3423 N. MARTIN L. KING JR. BLVD.
P.O. BOX 30195, LANSING, MICHIGAN 48909
VERNICE DAVIS ANTHONY, MPH, Director

February 17, 1995

James D. Kopotic, Site Manager
Former Sites Restoration Division
U.S. Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831-8723

Dear Mr. Kopotic:

This is to acknowledge receipt of your letter of February 2, 1995 concerning the DOE proposal for management of waste oil preparatory to the remediation of uranium contamination at the General Motors Corporation site in Adrian, Michigan.

A review of the information supplied with your letter included an assessment of the radiological aspects of the DOE proposal by staff of this office and an assessment of the hazardous waste aspects by staff of the Michigan Department of Natural Resources, Waste Management Division. Based upon the review, the following comments are offered:

Radiological Aspects

We concur with the DOE's assessment that the oil in the oil collection system within the former extrusion press operation area can be managed as normal waste oil without regard to radioactivity provided:

1. The average concentration of total uranium in the removed and collected oil remains below 300 picocuries per liter based upon representative sampling of the collected oil after removal from the oil collection system. Representative sampling should include samples from each container used for storage on site for the collected oil.

2. Consideration should be given to filtering the oil during the collection process and prior to bulk storage to remove particulates or sediments that would otherwise significantly disturb the homogeneity of the stored liquid or otherwise preclude representative sampling for radioactivity.

Z-25 6/94

3. If applicable, solid residues resulting from filtration of the oil prior to bulk storage should be separately sampled and analyzed for radioactivity, and, if above DOE guidelines for acceptable contamination, treated as radioactive waste for subsequent DOE management and disposal.

Hazardous Waste Characterization

1. The chemical analyses presented in the February 2, 1995 DOE strategy are not sufficient to characterize the waste oils as nonhazardous waste. The analyses were too variable, even though two of the samples were composites, and at least one of the three samples indicated that the oils may fail the toxicity characteristic.

2. The procedures and requirements for characterizing and managing hazardous wastes are more fully explained in Parts 2 and 3 of the administrative rules promulgated pursuant to 1979 PA 64, as amended, Michigan's Hazardous Waste Management Act. The oils should first be collected and containerized, and then the containers should be representatively sampled and analyzed for the toxicity characteristic. Additional sampling and analytical work can be avoided by classifying the oils as characteristic hazardous waste and sending them to a recycle facility [R 299.9206(3)(c)].

Thank you for the opportunity to provide comment concerning this matter. We request that this office continue to be notified of each scheduled step in the overall DOE remediation plan and that a copy of the final remediation plan be forwarded to us when available.

If you should have any questions concerning this information, please contact me at (517) 335-8200 or Steve Sliver at (517) 373-1976, as appropriate.

Sincerely,

BUREAU OF ENVIRONMENTAL
AND OCCUPATIONAL HEALTH

David W. Minnaar, Chief
Licensing and Registration Section
DIVISION OF RADIOLOGICAL HEALTH

DWM:rt

cc: Steve Sliver
Michigan Department of Natural Resources
Waste Management Division

2.9 RESTRICTIONS

There are no radiologically based restrictions on the future use of the subject property.

2.10 FEDERAL REGISTER NOTICE

This section contains a copy of the notice published in the *Federal Register*. It documents the certification that the subject property is in compliance with all applicable decontamination criteria and standards.

access transmission over the United States portion of EPE's electric transmission lines connecting the Diablo and Ascarate substations in the United States with the Insurgentes and Riverena substations in Mexico. Notice and a copy of the Delegation Order were published in the Federal Register on November 1, 1996, at 61 FR 56525.

Procedural Matters

Any persons desiring to become a party to this proceeding or to be heard by filing comments or protests to this application should file a petition to intervene, comment or protest at the address provided above in accordance with §§ 385.211 or 385.214 of the FERC's Rules of Practice and Procedures (18 CFR 385.211, 385.214). Fifteen copies of such petitions and protests should be filed with the DOE on or before the date listed above. Comments on GES's request to export to Mexico should be clearly marked with Docket EA-138. Comments on GES's request to export to Canada should be clearly marked with Docket EA-139. Additional copies are to be filed directly with: Peter G. Esposito; Daniel A. King, John, Hengerer and Esposito, 1200 17th St., NW, Suite 600, Washington, DC 20036-3006, (202) 429-8808 *and* Edward J. Faneuil, Global Energy Services, LLC , Watermill Center, 800 South Street, Waltham, Massachusetts 02254-9161, (617) 894-8800.

A final decision will be made on these applications after the environmental impacts have been evaluated pursuant to the National Environmental Policy Act of 1969 (NEPA), and a determination is made by the DOE that the proposed actions will not adversely impact on the reliability of the U.S. electric power supply system.

Copies of these applications will be made available, upon request, for public inspection and copying at the address provided above.

Issued in Washington, DC on January 23, 1997.

Anthony J. Como,

Manager, Electric Power Regulation, Office of Coal & Power Systems, Office of Fossil Energy.

[FR Doc. 97-2170 Filed 1-28-97; 8:45 am]

BILLING CODE 6450-01-P

[Docket No. EA-140]

Application To Export Electric Energy; Public Service Company of New Mexico

AGENCY: Office of Fossil Energy, DOE.

SUMMARY: Public Service Company of New Mexico (PNM), a regulated public utility, has submitted an application to export electric energy to Mexico pursuant to section 202(e) of the Federal Power Act.

DATES: Comments, protests or requests to intervene must be submitted on or before February 28, 1997.

ADDRESSES: Comments, protests or requests to intervene should be addressed as follows: Office of Coal & Power Im/Ex (FE-52), Office of Fossil Energy, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585 (FAX 202-287-5736).

FOR FURTHER INFORMATION CONTACT: Ellen Russell (Program Office) 202-586-9624 or Michael Skinker (Program Attorney) 202-586-6667.

SUPPLEMENTARY INFORMATION: Exports of electricity from the United States to a foreign country are regulated and require authorization under section 202(e) of the Federal Power Act (FPA) (16 U.S.C. 824a(e)).

On January 16, 1997, PNM filed an application with the Office of Fossil Energy (FE) of the Department of Energy (DOE) for authorization to export electric energy to Comision Federal de Electricidad (CFE), the Mexican national electric utility, or other power customers in Mexico, for a term of five years, pursuant to section 202(e) of the FPA. Specifically, PNM has proposed to engage in open-ended transactions to transmit and exchange wholesale electric energy under terms and contracts to be negotiated in the future.

PNM asserts that a series of State regulatory actions have left the utility with 170 megawatts (MW) of excess generating capacity that could be dedicated for the sale in the wholesale market. PNM further asserts that it will schedule all power consistent with the reliability criteria, standards, and guides of the North American Electric Reliability Council and the Western Systems Coordinating Council.

The electric energy PNM proposes to sell to CFE would be delivered to Mexico using San Diego Gas & Electric Company's two 230-kilovolt transmission facilities at Miguel and Imperial Valley, California. The construction and operation of these international transmission lines was previously authorized by Presidential Permit numbers PP-68 and PP-79, respectively.

Procedural Matters

Any persons desiring to become a party to this proceeding or to be heard by filing comments or protests to this application should file a petition to intervene, comment or protest at the address provided above in accordance with §§ 385.211 or 385.214 of the FERC's Rules of Practice and Procedures (18 CFR 385.211, 385.214). Fifteen copies of such petitions and protests should be filed with the DOE on or before the date listed above. Additional copies are to be filed directly with: John T. Stough, Jr., Long, Aldridge & Norman, L.L.P., 701 Pennsylvania Ave., N.W., Suite 600, Washington, D.C. 20004 And Patrick T. Ortiz, Secretary and General Counsel, Public Service Company of New Mexico, Alvarado Square, Albuquerque, N.M. 87158.

A final decision will be made on this application after the environmental impacts have been evaluated pursuant to the National Environmental Policy Act of 1969 (NEPA), and a determination is made by the DOE that the proposed action will not adversely impact on the reliability of the U.S. electric power supply system.

Copies of this application will be made available, upon request, for public inspection and copying at the address provided above.

Issued in Washington, DC on January 23, 1997.

Anthony J. Como,

Manager, Electric Power Regulation, Office of Coal and Power Systems, Office of Fossil Energy.

[FR Doc. 97-2171 Filed 1-28-97; 8:45 am]

BILLING CODE 6450-01-P

Certification of the Radiological Condition of the General Motors Site in Adrian, Michigan

AGENCY: Department of Energy.

ACTION: Notice of certification.

SUMMARY: The Department of Energy (DOE) has completed remedial actions to decontaminate the General Motors site in Adrian, Michigan. Formerly, the property was found to contain quantities of residual radioactive material resulting from activities conducted by DOE's predecessors at the former Bridgeport Brass Specialty Metals Plant. Radiological surveys show that the property now meets applicable requirements for radiologically unrestricted use, and the certification docket is now available.

ADDRESSES: The certification docket is available at the following locations:

Public Reading Room, Room 1E-190, Forrestal Building, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, D.C. 20585;

Public Document Room, Oak Ridge Operations Office, U.S. Department of Energy, 200 Administration Road, Oak Ridge, Tennessee 37831;

Adrian Public Library, 143 East Maumee Street, Adrian, Michigan 49221.

FOR FURTHER INFORMATION CONTACT: William E. Murphie, Acting Director, Office of Eastern Area Programs, Office of Environmental Restoration (EM-42), U.S. Department of Energy 19901 Germantown Road (Cloverleaf Building), Germantown, Maryland 20874-1290, (301) 903-2328, Fax: (301) 903-2385.

SUPPLEMENTARY INFORMATION: The Department of Energy (DOE), Office of Environmental Management, has conducted remedial action at the General Motors site, formerly the Bridgeport Brass Specialty Metals Plant, under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The objective of the program is to identify and remediate or otherwise control sites where residual radioactive contamination remains from activities carried out under contract to the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the early years of the nation's atomic energy program. During the 1950s, the Bridgeport Brass Company operated a Special Metals Extrusion Plant at the site in Adrian, Michigan, under contract AT-(30-1)-1405 with the AEC. The plant was operated to extrude uranium metal, which was used to make reactor fuel elements for AEC nuclear reactors at the Hanford site in Washington and the Savannah River site in South Carolina. In July 1988, the former Bridgeport Brass Specialty Metals Plant, now called the General Motors site, was designated for cleanup under FUSRAP.

At the completion of work by the Bridgeport Brass Company, one large extrusion press was shipped to Reactive Metals, Inc., in Ashtabula, Ohio, and put into operation there. All other equipment was dismantled and scrapped; its final disposition is unknown. The Adrian, Michigan, plant was eventually sold to Martin Marietta in the early 1960s and then to General Motors, Inland Fisher Guide Division, in 1974. No records exist from 1961 until 1976 to document residual radioactive contamination levels on the floor, walls, fixtures, and structural members of the building or the interim decontamination efforts performed. However, in subsequent surveys, residual uranium contamination in excess of applicable standards was found, and further cleanup of the site was determined to be warranted. DOE conducted remedial action at the site from April to July 1995.

Post-remedial action surveys have demonstrated, and DOE has certified, that the subject property is in compliance with the Department's radiological decontamination criteria and standards. The standards are established to protect members of the general public and occupants of the property and to ensure that future use of the property will result in no radiological exposure above applicable guidelines. These findings are supported by the Department's "Certification Docket for the Remedial Action Performed at the General Motors Site, Adrian, Michigan." Accordingly, this property is released from FUSRAP.

The certification docket will be available for review between 9:00 a.m.-4:00 p.m., Monday through Friday (except Federal holidays) in the Department's Public Reading Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. 20585. Copies of the certification docket will also be available in the DOE Public Document Room, U.S. Department of Energy, Oak Ridge Operations Office, Oak Ridge, Tennessee, 37831 and at the Adrian Public Library, 143 East Maumee Street, Adrian, Michigan, 49221.

DOE, through the Oak Ridge Operations Office, Former Sites Restoration Division, has issued the following statement:

Statement of Certification: General Motors Site in Adrian, Michigan

The Department of Energy (DOE), Oak Ridge Operations Office, Former Sites Restoration Division, has reviewed and analyzed the radiological data obtained following remedial action at the General Motors site (Property XAO-100-0152-00, Liber 788, Page 688 in the records of the County of Lenawee). Based on analysis of all data collected, including post-remedial action surveys, DOE certifies that any residual contamination which remains onsite falls within current guidelines for use without radiological restrictions. This certification of compliance provides assurance that reasonably foreseeable future use of the property will result in no radiological exposure above current radiological guidelines established to protect members of the general public as well as occupants of the site.

Property owned by: General Motors, Inland Fisher Guide Division, 1450 Beecher Street, Adrian, Michigan.

Issued in Washington, D.C. on January 17, 1997.

James J. Fiore,

Acting Deputy Assistant Secretary for Environmental Restoration.

[FR DOC. 97-2172 Filed 1-28-97; 8:45 am]

BILLING CODE 6450-01-P.

Office of Energy Efficiency and Renewable Energy

Energy Conservation Program for Consumer Products: Granting of the Application for Interim Waiver and Publishing of the Petition for Waiver of Hunter Energy and Technology Inc. From the DOE Vented Home Heating Equipment Test Procedure (Case No. DH-009)

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice.

SUMMARY: Today's notice grants an Interim Waiver to Hunter Energy and Technology Inc. (Hunter) from the Department of Energy (DOE or Department) test procedure for vented home heating equipment. The Interim Waiver concerns pilot light energy consumption for Hunter's models FI25H, HDS2000, HDV30E, HDV2500, PW20, PW35, PW50, HFI30, HFS40, HWF15, and HWF30 vented heaters.

Today's notice also publishes a "Petition for Waiver" from Hunter. Hunter's Petition for Waiver requests DOE to grant relief from the DOE vented home heating equipment test procedure relating to the use of pilot light energy consumption in calculating the Annual Fuel Utilization Efficiency (AFUE). Specifically, Hunter seeks to delete the required pilot light measurement (Q_p) in the calculation of AFUE when the pilot is off. The Department solicits comments, data, and information respecting the Petition for Waiver.

DATES: DOE will accept comments, data, and information not later than February 28, 1997.

ADDRESSES: Written comments and statements shall be sent to: Department of Energy, Office of Energy Efficiency and Renewable Energy, Case No. DH-009, Mail Stop EE-43, Room 1J-018, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0121, (202) 586-7140.

FOR FURTHER INFORMATION CONTACT:

William W. Hui, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Mail Stop EE-43, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585-0121, (202) 586-9145; or

Eugene Margolis, Esq., U.S. Department of Energy, Office of General Counsel, Mail Stop GC-72, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585-0103, (202) 586-9507.

SUPPLEMENTARY INFORMATION: The Energy Conservation Program for

2.11 APPROVED CERTIFICATION STATEMENT

The following certification statement documents release of the subject property for future use without radiological restrictions.

148080

STATEMENT OF CERTIFICATION: GENERAL MOTORS SITE IN ADRIAN MICHIGAN

DOE, Oak Ridge Operations Office, Former Sites Restoration Division, has reviewed and analyzed the radiological data obtained following remedial action at the General Motors site (Property XAO-100-0152-00, Liber 788, Page 688 in the records of the County of Lenawee). Based on analysis of all data collected, including post-remedial action surveys, DOE certifies that any residual contamination which remains onsite falls within current guidelines for use without radiological restrictions. This certification of compliance provides assurance that reasonably foreseeable future use of the property will result in no radiological exposure above current radiological guidelines established to protect members of the general public as well as occupants of the site.

Property owned by: General Motors, Inland Fisher Guide Division
1450 Beecher Street
Adrian, Michigan

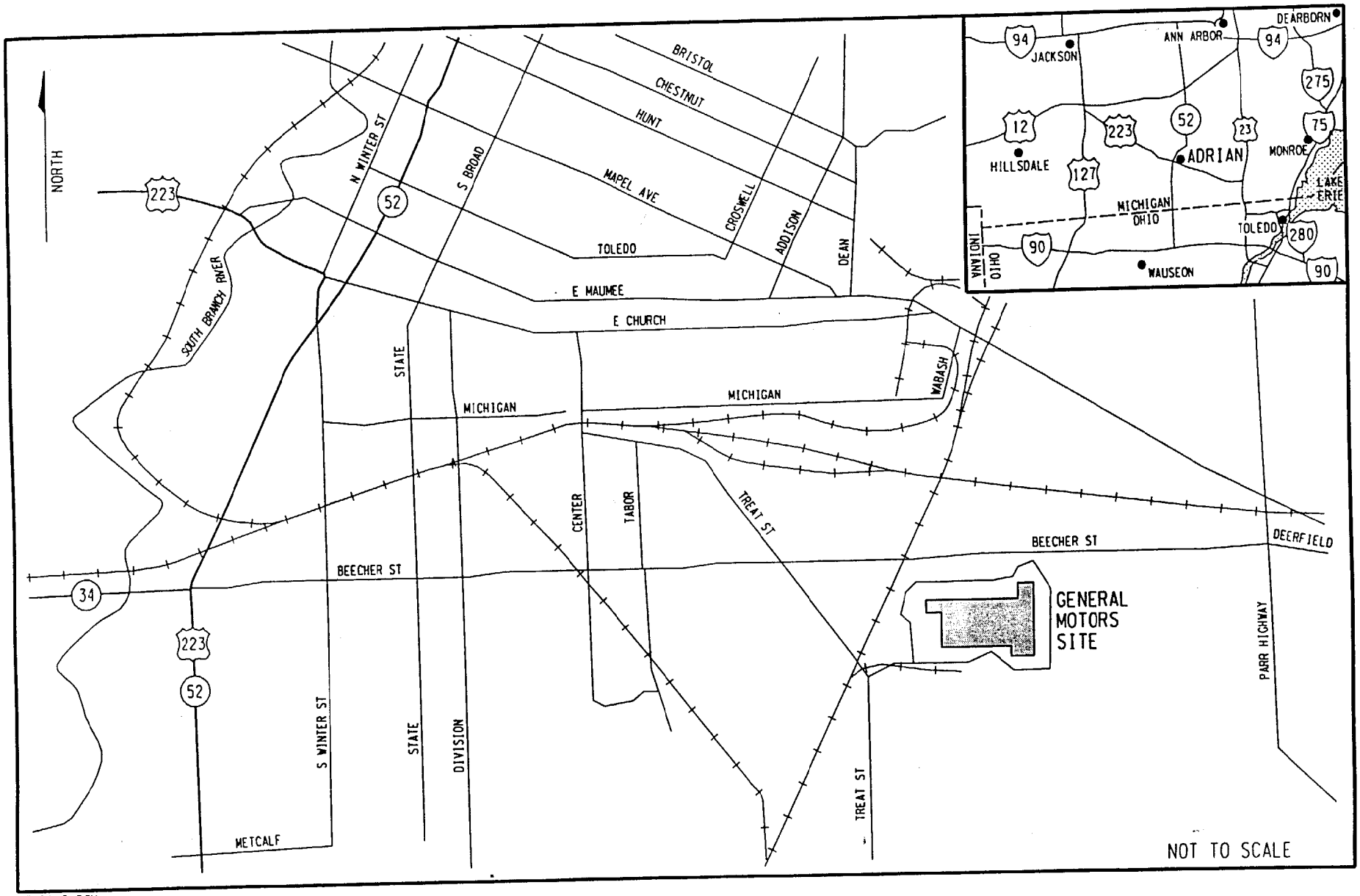
Date: 11/8/96

William M. Seay, Acting Director
Former Sites Restoration Division
Oak Ridge Operations Office
U. S. Department of Energy

EXHIBIT III

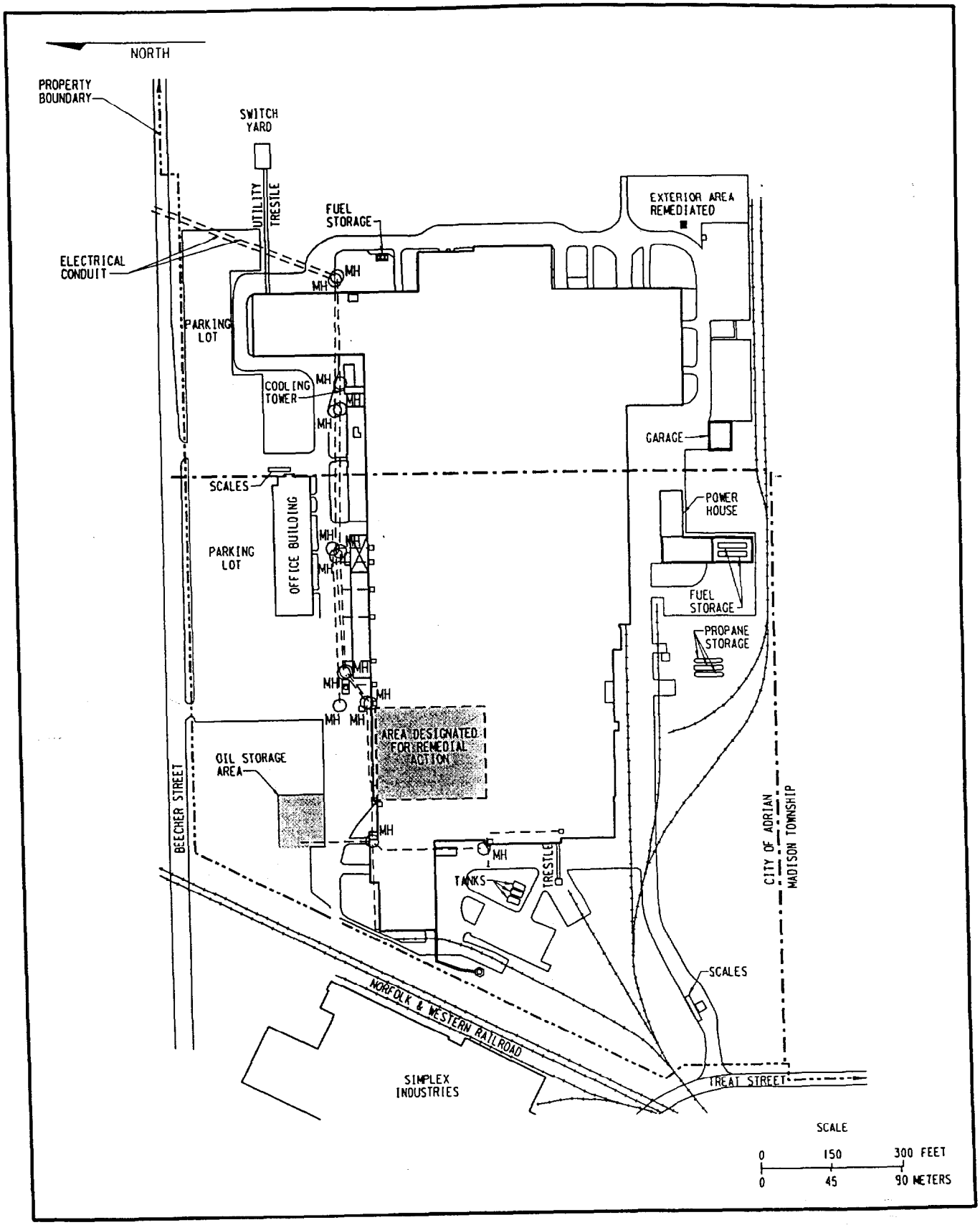
DIAGRAMS OF THE REMEDIAL ACTION PERFORMED AT THE GM SITE
IN ADRIAN, MICHIGAN, FROM APRIL 1995 TO JULY 1995

The figures on the following pages illustrate the extent of remedial action performed at the subject property.



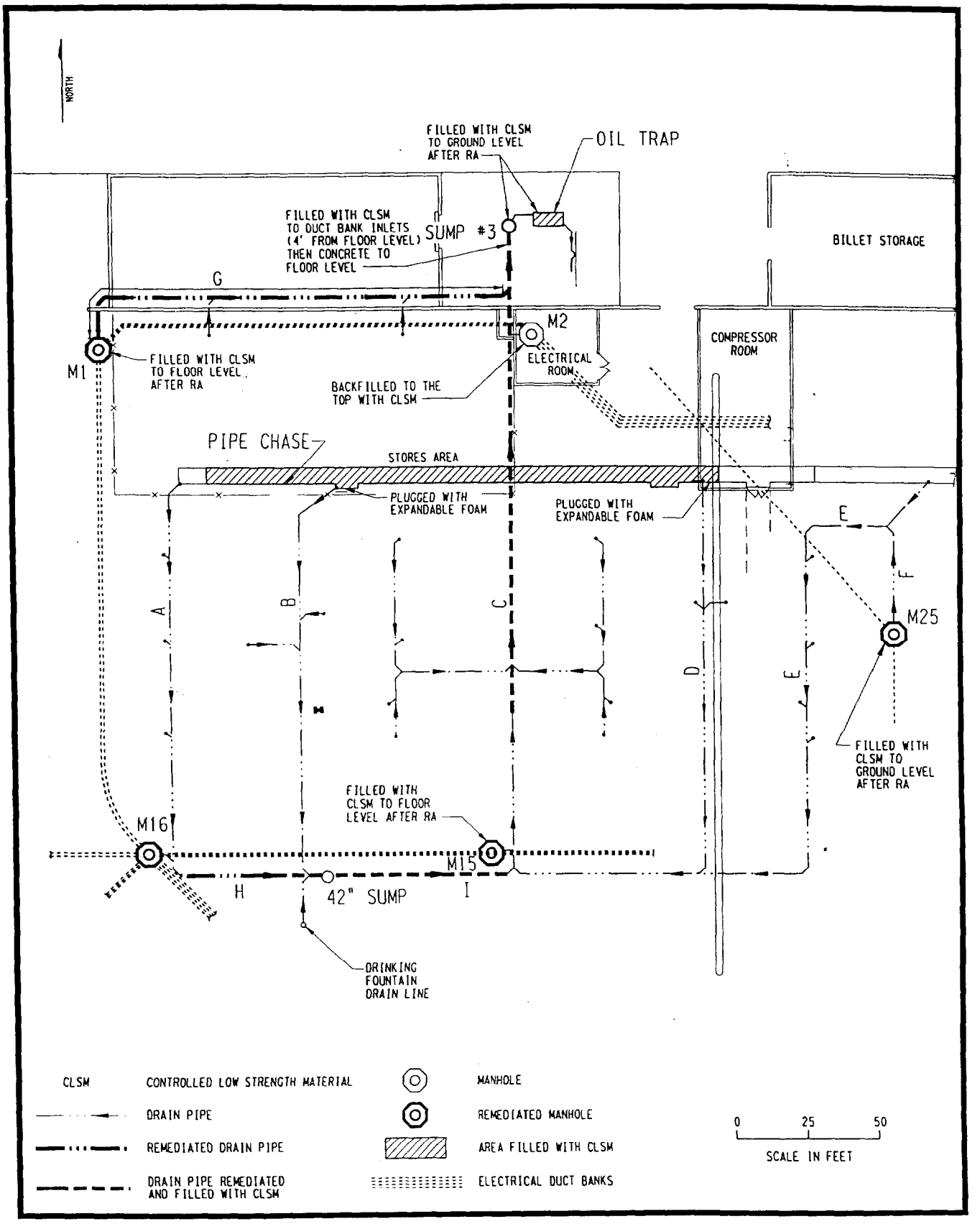
R78F015.DGN
10/3/96

Figure III-1
General Motors Site Location Map



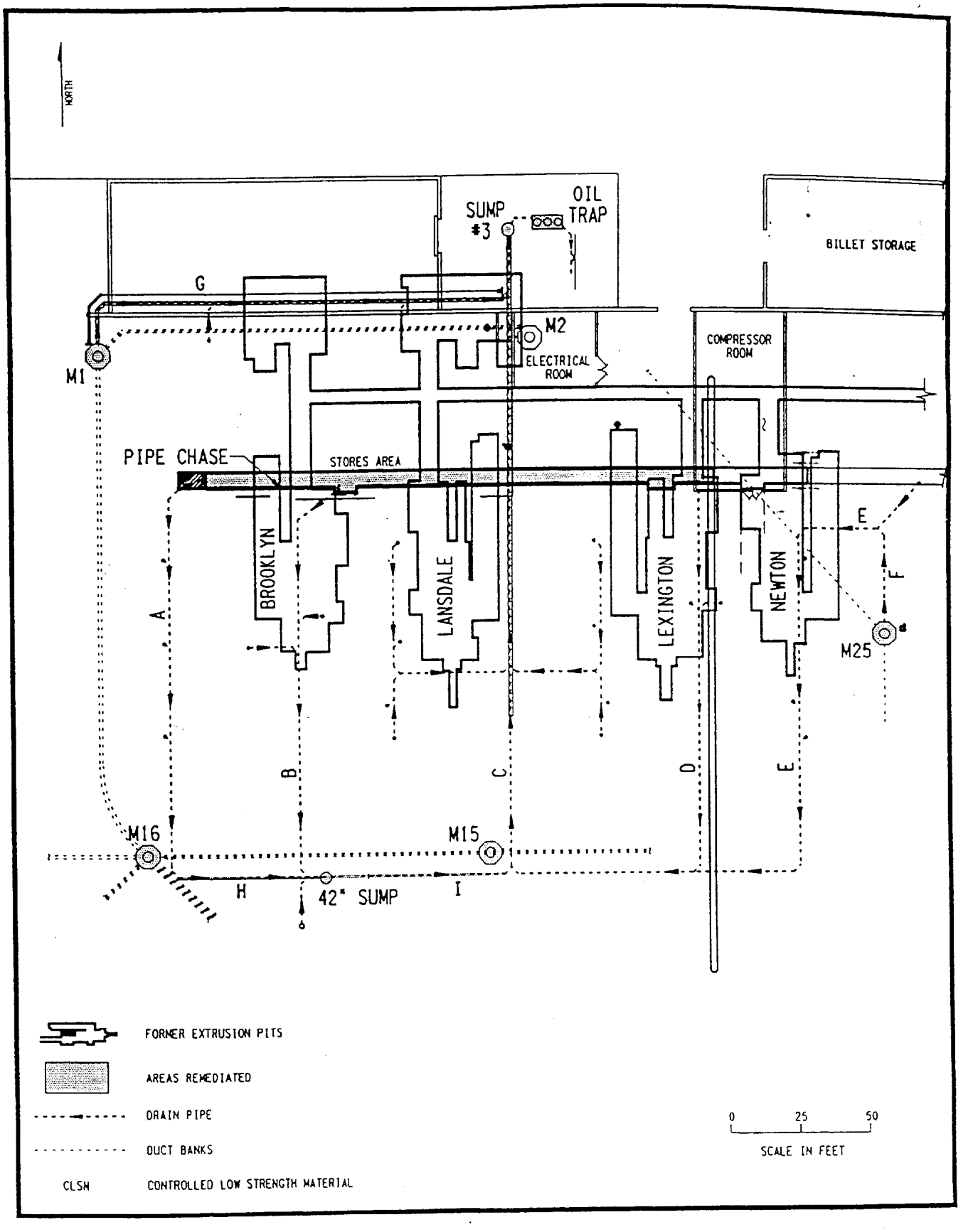
R78F009.DGN
10/3/96

Figure III-2
General Motors Site Plan



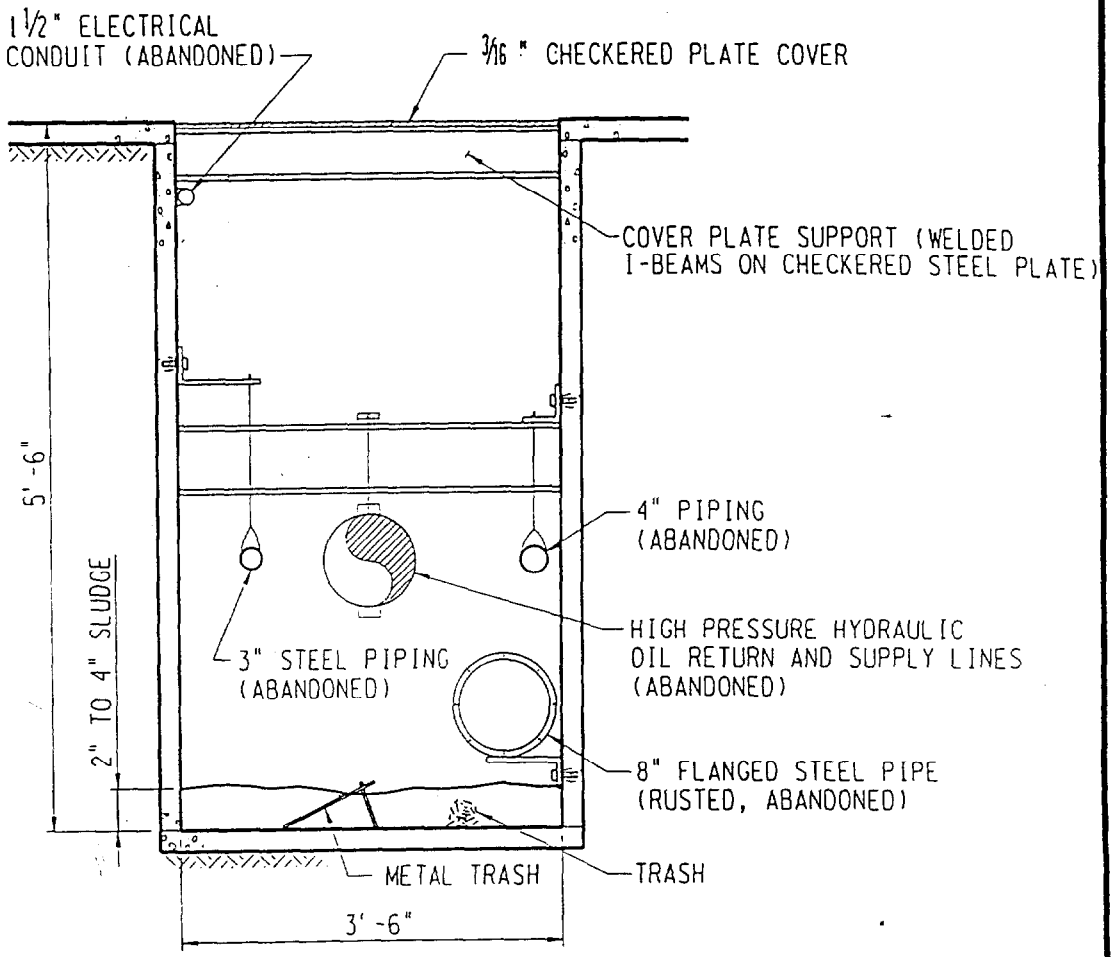
R78F013.DGN
10/7/96

Figure III-3
Piping System Designated for Remedial Action
with Post Remedial Action Status



R78F014.DGN

Figure III-4
Former Extrusion Pit Areas Designated for Remedial Action with Associated Drainage System

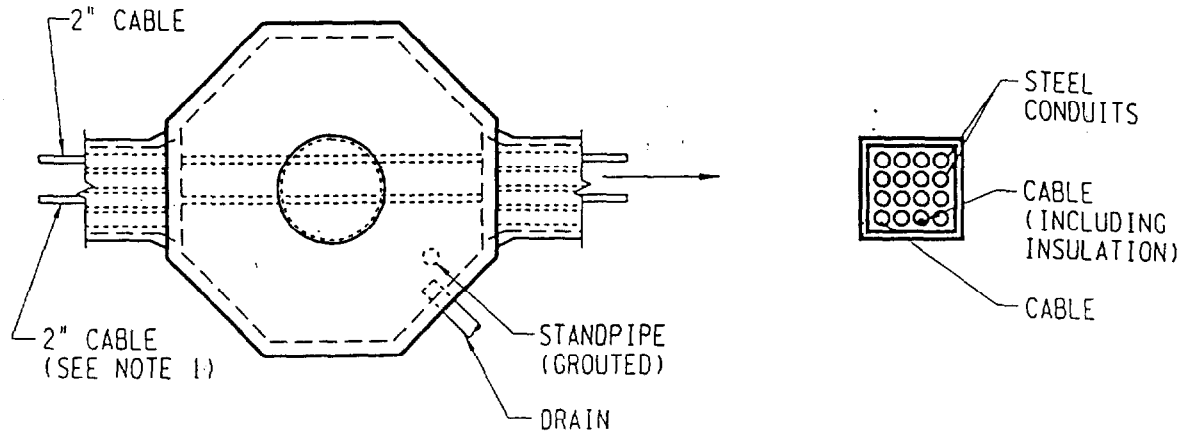


NOTES:

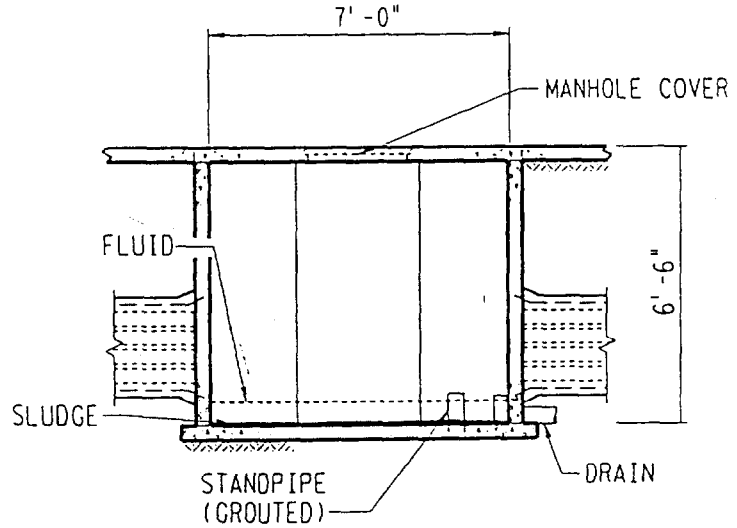
1. RUST ON ALL COMPONENTS.
2. SEE GENERAL LOCATION ON FIGURE I-3.

141F021.DGN

Figure III-5
Typical Section Through Pipe Chase
Before Remedial Action



TOP VIEW - MANHOLE



SIDE VIEW - MANHOLE

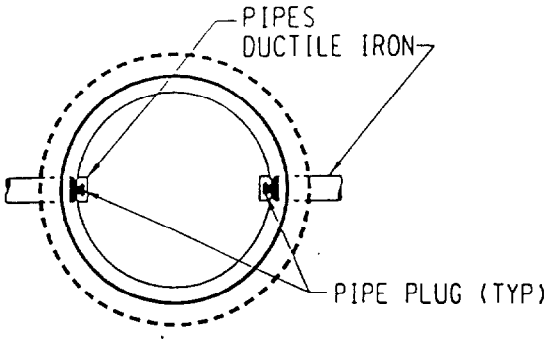
NOTES:

1. 2" CABLE IS INSULATED WITH ASBESTOS.
2. SEE GENERAL LOCATION ON FIGURE 1-3.

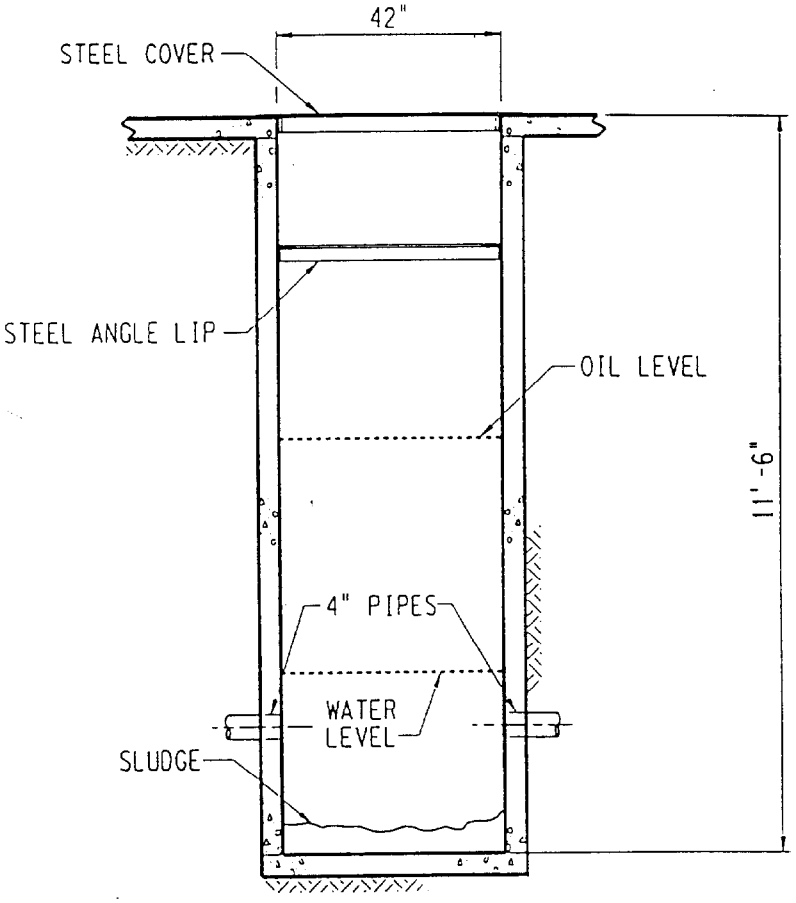
141F024.DGN

Figure III-6

Typical Manhole Before Remedial Action



TOP VIEW - 42" SUMP
(COVER REMOVED)



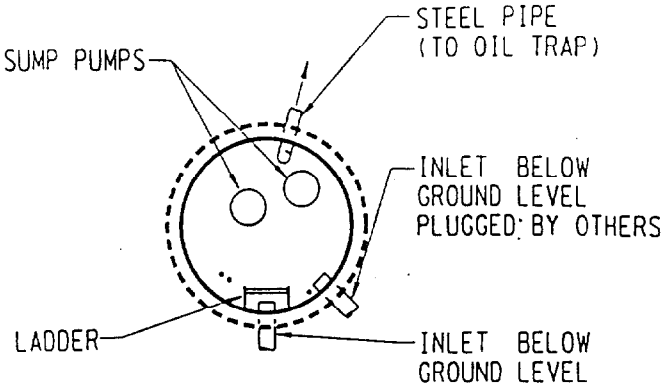
SIDE VIEW - 42" SUMP

NOTE:

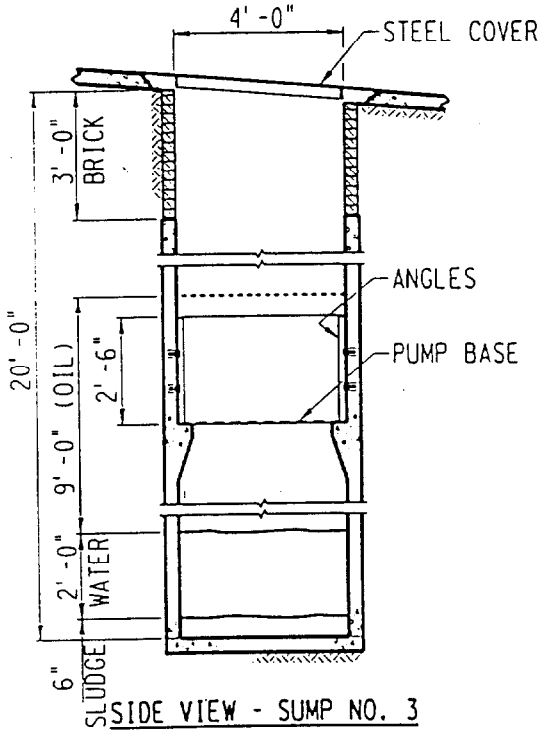
SEE GENERAL LOCATION ON FIGURE 1-3.

141F025.DGN

Figure III-7
Forty-Two-Inch Sump Before Remedial Action



TOP VIEW - SUMP NO. 3
(COVER REMOVED)



SIDE VIEW - SUMP NO. 3

NOTES:

1. RUST WAS PREVALENT ON ALL METAL COMPONENTS.
2. BRICK WAS DETERIORATED.
3. STEEL ACCESS LADDER WAS RUSTED.
4. SUMP PUMPS, LADDER, ELECTRICAL CONDUITS WERE NOT SHOWN IN THE SECTION FOR CLARITY.
5. SEE GENERAL LOCATION ON FIGURE 1-3.

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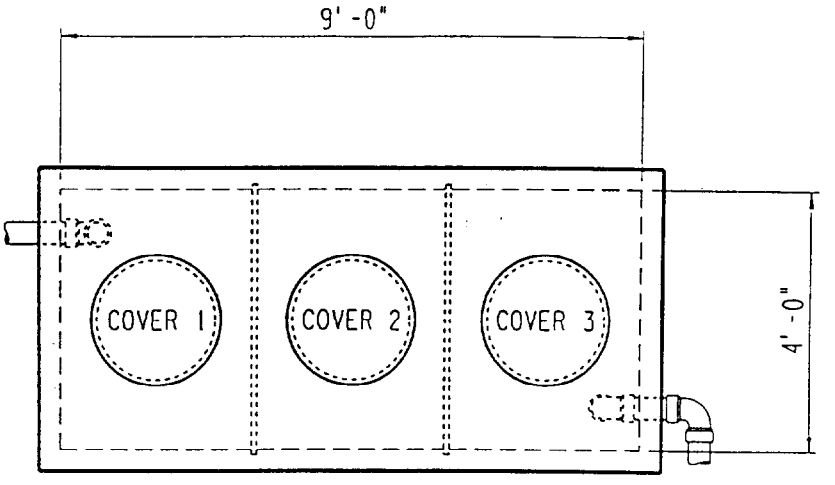
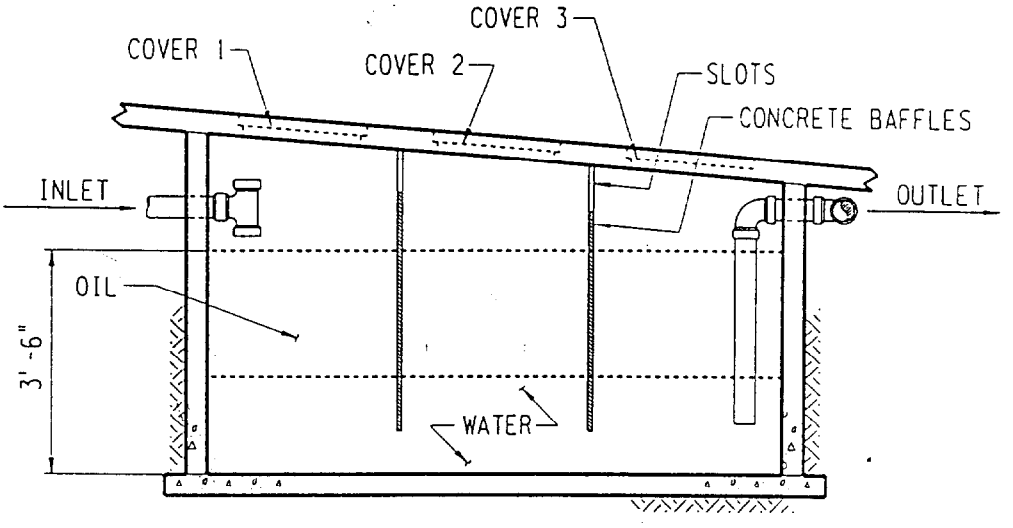
Figure III-8
Sump 3 Before Remedial Action



TOP VIEW - OIL TRAP



SIDE VIEW - OIL TRAP

NOTES:

1. COVER NO. 1 IS GROUTED IN PLACE AND COULD NOT BE OPENED.
2. SEE GENERAL LOCATION ON FIGURE 1-3.

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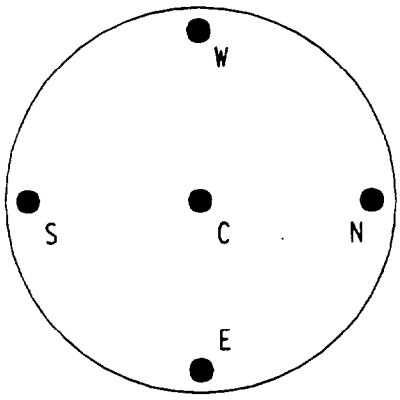
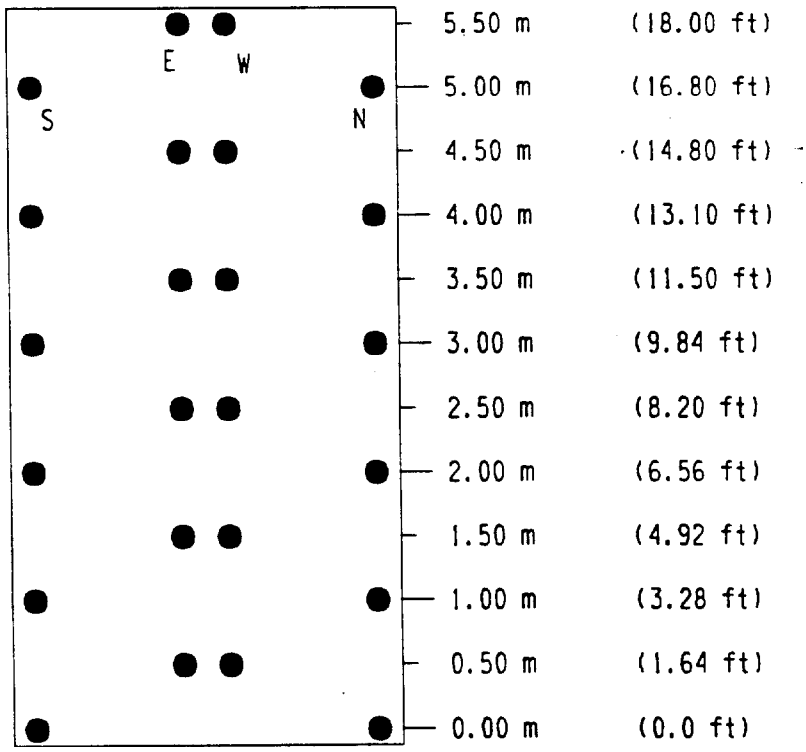
Figure III-9
Oil Trap Before Remedial Action



FLOOR OF SUMP #3
(TOP VIEW)



WALL OF SUMP #3
(SIDE VIEW)

● SURFACE SURVEY LOCATIONS

NOTE:

SEE TABLE I-3 FOR SUMMARY OF POST-REMEDIAL ACTION RESULTS.

SCALE

0 1 2 FEET

0 .3 .6 METERS

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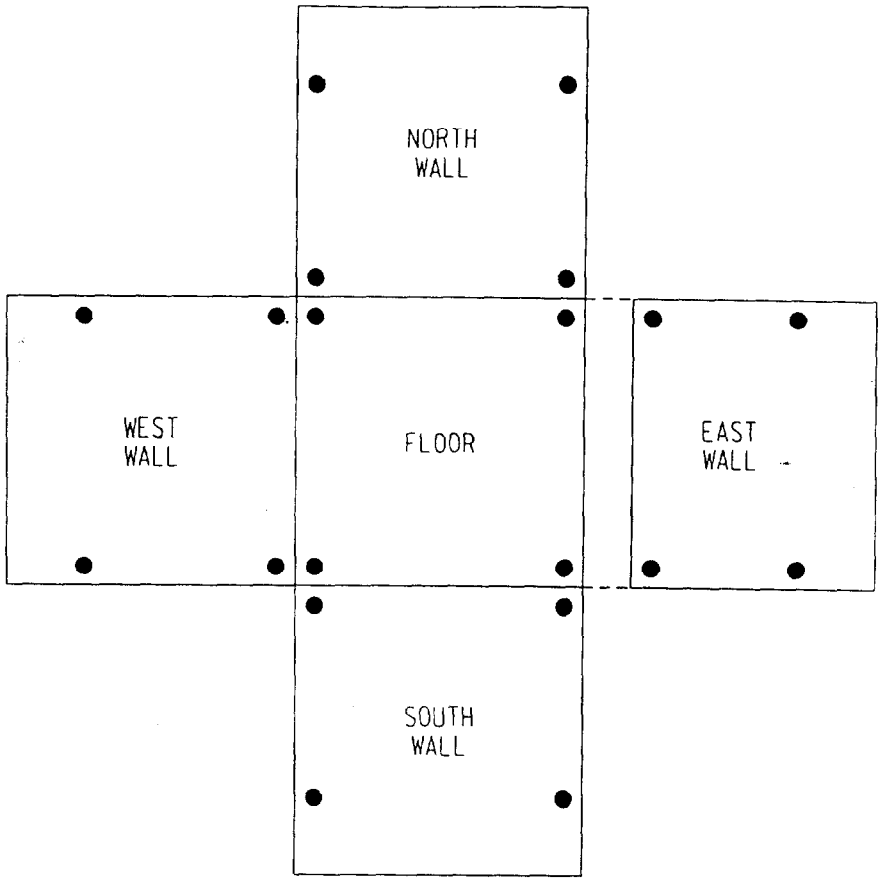
Figure III-10
Post-Remedial Action Survey Locations for Sump 3



EXPLODED VIEW

● SURFACE SURVEY LOCATIONS

NOTE:

SEE TABLE I-3 FOR SUMMARY OF
POST-REMEDIAL ACTION SURVEY RESULTS.

SCALE: 3/8" = 1'

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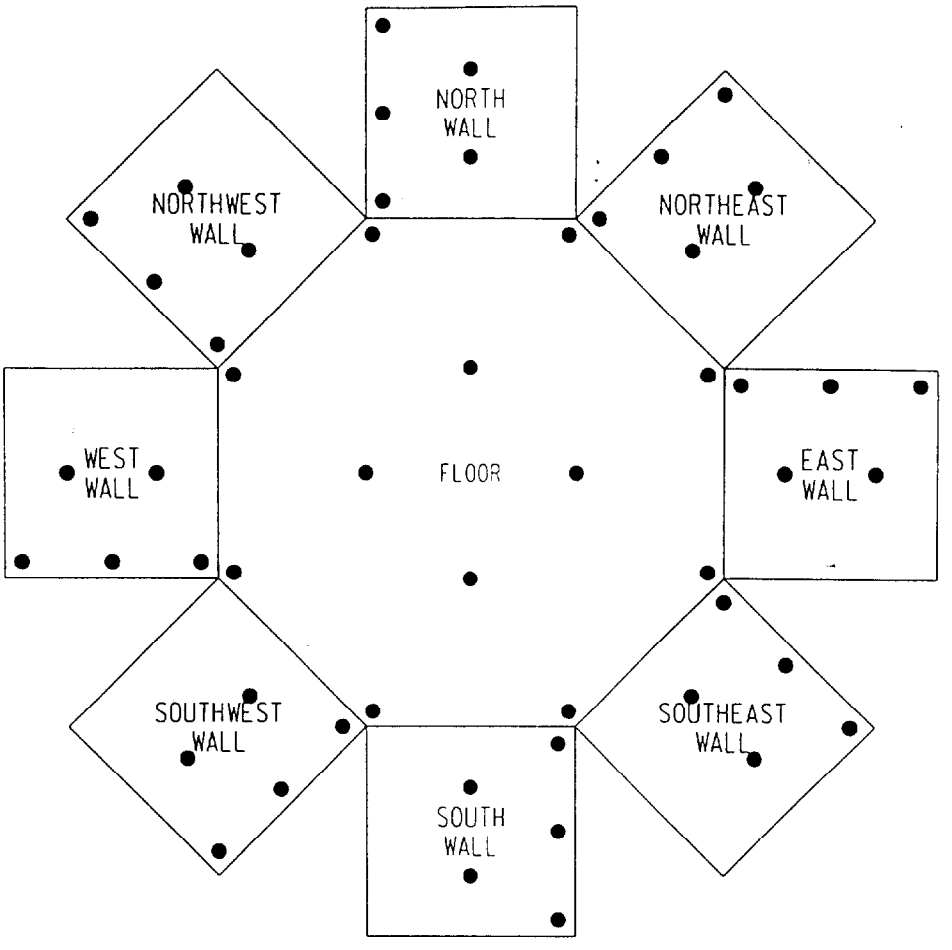
Figure III-11
Typical Post-Remedial Action Survey Locations
for Sump 3 Oil Trap



EXPLODED VIEW

● SURFACE SURVEY LOCATIONS

NOTE:

SEE TABLE I-3 FOR SUMMARY OF POST REMEDIAL ACTION SURVEY RESULTS

SCALE: 3/8" = 1'

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10/3/95

Figure III-12
Typical Post Remedial Action Survey Locations
for the Remediated Manholes