U.S. Army Corps of Engineers
Buffalo District Office
1776 Niagara Street, Buffalo, New York, 14207

Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites

Tonawanda, New York

September 20, 2004

Formerly Utilized Sites Remedial Action Program

Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites

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I. INTRODUCTION

The *Record of Decision (ROD) for the Ashland 1 (Including Seaway Area D) and Ashland 2 Sites* located in Tonawanda, New York was issued by the United States Army Corps of Engineers (USACE) on April 20th, 1998. The ROD identifies radium-226 (Ra-226), thorium-230 (Th-230) and uranium-238 (U-238) as radiological contaminants of concern (COCs) in soils.

In the ROD, USACE determined that Title 40, Part 192 of the *Code of Federal Regulations* [40 CFR Part 192] and Title 10, Part 20 of the *Code of Federal Regulations* [10 CFR 20] were applicable or relevant and appropriate requirements (ARAR) for the site. It further determined, based on the expected distribution of the COCs in the soil at the site, that if all the soil containing more than 40 picocuries/gram (pCi/g) Th-230 was removed from the Ashland sites, the residual concentrations of the other COCs at the site would be low enough to insure compliance with 40 CFR Part 192 and 10 CFR 20 and be protective of human health and the environment.

Rattlesnake Creek runs through the Ashland 2 site. As part of the remedial activities at the Ashland 2 site, soil samples were collected in Rattlesnake Creek. The results of the sampling indicated that the creek contained radionuclide contamination that had originated from the Ashland and Seaway properties. However, the distribution of the COCs in the sediments of the creek is different than the distribution of those same COCs in the soils at the Ashland sites.

In order to address the different distribution of COCs in the Rattlesnake Creek sediments USACE has developed site-specific derived concentration guideline levels (DCGLs) for use in the field during the remediation of the Rattlesnake Creek area. These DCGLs will result in residual concentrations of the COCs in the sediments that are consistent with the residual soil concentrations at the Ashland 2 and Ashland 1 sites that have already been remediated, and will meet the requirements of the ARARs and be protective to human health. In developing that guideline, USACE has used an approach similar to the one set forth in Title 10, Part 40 of the *Code of Federal Regulations* [10 CFR 40], the Nuclear Regulatory Commission's regulation pertaining to the decommissioning of licensed sites, and also followed the approach of the dose assessment for the Ashland sites, presented in *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997). 10 CFR 40 provides a benchmark dose method for achieving a criteria for residual radium in soil that is the same as that found in 40 CFR 192.

The DCGLs for Rattlesnake Creek for the three principal radionuclides of concern (Ra-226, Th-230, and U-238) are provided in Table 1. The DCGLs are incremental to background concentrations and represent average concentration guidelines for specific size areas. The derivation of the revised DCGLs is documented in the *Rattlesnake Creek Final Status Survey Plan* (USACE 2004).

	DCGLs for Area Size (pCi/g)		
	10,000 square meters	100 square meters	1 square meter
Ra-226	4.3	5	16
Th-230	12	14	46
U-238	350	450	2000

Table 1. Revised Site-Specific Cleanup Levels

This Explanation of Significant Differences (ESD) is being prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 300.435(c)(2)(1) of the National Contingency Plan (NCP). The statute and regulation require that a lead agency document changes made during a remedial action after adoption of a final remedial action plan when such action differs in any significant respect from the final plan. The lead agency is also required to consult with the support agency regarding the ESD then make it available to the public. The lead agency for this site is USACE and the support agency is the New York State Department of Environmental Conservation (NYSDEC).

The administrative record file contains the ESD, ROD and all documentation used to prepare them, and is available at the following locations:

U.S. Army Corps of Engineers
Public Information Center
1776 Niagara Street
Buffalo, NY 14207-3199

Available Monday through Friday 8:30-4:00, closed on federal holidays

Tonawanda Public Library
333 Main Street
Tonawanda, NY 14150

Summer (last Saturday in June - Tuesday after Labor Day)
Monday, Tuesday, Thursday - 10-8:30
Wednesday, Friday - 10-5:30
Saturday, Sunday - Closed

Winter
Monday, Tuesday, Thursday - 10-8:30
Friday, Saturday - 10-5:30
Wednesday, Sunday - Closed

II. SITE HISTORY, CONTAMINATION AND SELECTED REMEDY

A. Site History

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 to identify, investigate and clean up or control sites that were part of the Nation's early atomic energy program. Activities at these sites were performed by the Manhattan Engineer District (MED) (1944 – 1946) or under the Atomic Energy Commission (AEC)(1947 – 1975). Both the MED and AEC were predecessors of the U.S. Department of Energy (DOE). In 1997, Congress transferred the responsibility for the program from the DOE to the USACE.

The Buffalo District FUSRAP Ashland 1 (including Seaway Area D) and Ashland 2 Sites are located in Tonawanda, New York, as shown on Figure 1. During the early to mid-1940's, portions of the property located at the former Linde Site were used for the processing of uranium ores under Federal MED contracts. In 1943, when commercial operations began at the Linde Site, efforts were also underway to identify a storage site for waste residues produced during uranium processing at the Linde Site. In 1943, MED leased a 10-acre tract known as the Haist property, now called Ashland 1, to serve as a storage site for the uranium ore processing residues. Residues were deposited at Ashland 1 from 1944 to 1946 and consisted primarily of low-grade uranium ore tailings. In 1960, the property was transferred to the Ashland Oil Company and has been used as part of this company's oil refinery activities since that time. In 1974, Ashland Oil Company constructed a bermed area for two petroleum product storage tanks and a drainage ditch on the Ashland 1 property. The majority of the soil removed during construction of the bermed area and drainage ditch was transported by Ashland Oil Company to the Seaway landfill and Ashland 2 sites for disposal. Surface water from the Ashland sites drains via Rattlesnake Creek and Two Mile Creek to the Niagara River. Figure 2 shown the locations of Ashland 1, Ashland 2, Seaway, Linde and Rattlesnake Creek.

Drainage from Ashland 1 travels under the Seaway property through an underground concrete conduit. Rattlesnake Creek receives this drainage, along with all drainage from the Seaway landfill, and then crosses Niagara Mohawk property before entering the Ashland 2 property. The creek is approximately 10 feet wide and 3 feet deep at bank-full capacity, and has a 1% slope on the Ashland 2 property. The creek and the adjacent low-lying areas are vegetated with a thick growth of cattails and rushes, which limit flow velocities. The low-lying area is approximately 100 feet wide on Ashland 2. Three small drainage ditches join Rattlesnake Creek after it crosses Ashland 2. The creek then travels approximately 3,200 feet before its confluence with Two Mile Creek.

The Rattlesnake Creek portion of the Ashland sites can be broken into three zones. As shown in Figure 3, the first zone encompasses the upper reaches of the creek and includes the two branches of Rattlesnake Creek that bracket Ashland 2. The second zone is the reach of creek from the confluence of the two branches to the location where the creek disappears into a ponded area into an underground pipe. The third zone is from the discharge of the underground pipe to where Two Mile Creek joins the Niagara River. The maximum and the average contamination concentrations observed in soil samples decrease significantly moving from Zone 1, to Zone 2, and finally to Zone 3.

B. Original Remedy

The selected remedy for the Ashland sites required the excavation and offsite disposal of all soils necessary in order to comply with the selected ARARs. Specific components of the selected alternative are that would achieve compliance with the ARARs were:

- Excavate soils exceeding the site-specific derived guideline of 40 pCi/g Th-230 at the Ashland sites, as described in the document entitled *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997).

- Ship offsite for appropriately licensed or permitted disposal all soils excavated that exceed the 40 pCi/g Th-230 guidance.

- Restore the sites with clean backfill from an off-site commercial source, and seed to restore vegetative cover at the sites to their original state.

III. BASIS FOR THIS DOCUMENT

A. Summary of Additional Information

1. Agencies responsible for remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) must ensure that selected remedies meet applicable or relevant and appropriate requirements (ARARs). USACE determined that the following statue and regulations are ARARS for the cleanup of the radionuclides present in soils at the Ashland sites:

- The material will be controlled in a safe and environmentally sound manner (Uranium Mill Tailings Act (UMTRCA), 42 U.S.C 7901 et. seq.)

- Ra-226 concentrations shall not exceed background levels by more than 5 pCi/g in the top 15 cm (6 in.) or by more than 15 pCi/g in any subsequent 15 cm (6 in.) layer, averaged over 100 m^2 (Subpart B of 40 CFR 192).

- The release of Rn-222 and Rn-220 into the atmosphere resulting from the management of uranium and thorium by-product materials shall not exceed an average release rate of 20 pCi/m^2-s (Subpart D of 40 CFR 192).

- The radiological dose to a potential residential receptor must be equal to or less than 25 millirem (mrem)/yr (Subpart E of 10 CFR 20).

Analysis of the soil data collected during the remedial investigation at the Ashland sites showed that the selected remedy identified in the ROD, excavation and offsite disposal of soils containing 40 pCi/g Th-230 or more would result in residual concentrations that would satisfy all the CERCLA risk criteria, and comply with the ARARs listed above. Additionally, the analysis described in the *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997), showed that removal of soils exceeding 40 pCi/g Th-230 would allow the Ashland sites to be released without land use restrictions (DOE 1997).

Prior to the ROD being signed, there was little evidence that Rattlesnake Creek had radionuclide concentrations at levels of concern. However, the results of the soil samples collected during the Ashland 2 remedial action in and around Rattlesnake Creek indicated that radionuclide concentrations in the creek did exceed levels of concern. The data also indicated that the transport mechanism for the radionuclide-contaminated material was migration via erosional processes into Rattlesnake Creek from contaminated ore residuals placed on the Seaway and Ashland properties as opposed to direct placement of the material into the creek. Due to way the material was transported and differences in solubility of the contaminants and dilution, the distribution of COCs in the sediments of the creek is different than the distribution of those same COCs in the Ashland site soils. In order to better address the distribution of COCs in the Rattlesnake Creek area, DCGLs were developed. The DCGLs were derived by using RESidual RADioactivity computer code (RESRAD) version 6.10 and site-specific parameters and scenarios detailed in the *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997), and to be consistent with the specified activity concentrations contained in the first ARAR listed above. The derivation of the DCGLs is documented in Appendix B of the *Rattlesnake Creek Final Status Survey Plan* (USACE 2004).

The DCGLs presented in this ESD have specific area sizes assigned to them, are consistent with the cleanup criteria in the ROD, and provide equal protectiveness of human health and the environment. The ROD requires that soils exceeding 40 pCi/g Th-230 be excavated. The not-to-exceed value of 40 pCi/g Th-230 is the result of rounding down from DOE's calculated value of 47 pCi/g Th-230 (DOE 1997). This value is consistent with the DCGL for a 1 square meter area of 46 pCi/g (Table 1). The Th-230 DCGL for the large area (i.e., 10,000 square meters) presented in Table 1 is 12 pCi/g, the same required site wide average residual concentration developed and documented in the *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997). Implementation of the 40 pCi/g Th-230 ROD requirement at the Ashland 2 and Ashland 1 sites resulted in post-remedial action, site-wide average Th-230 concentrations of 5.17 pCi/g and 2.91 pCi/g, respectively. To ensure meeting the site-wide average criterion and the required ARARs, the USACE is presenting DCGLs for the implementation of the remedial action at the Rattlesnake Creek portion of the site.

2. There is also new information regarding the volume of materials to be removed from the site in order to meet the requirements of the ROD and the cost of that work. The original estimate of volume for excavation and offsite disposal of contaminated soil at Ashland 1 (including Seaway Area D), and Ashland 2 was 42,000 yd^3 at a cost of 38 million dollars. To date, with excavation at the Ashland 1 and 2 sites completed, 186,000 yd^3 of contaminated soil have been removed in order to meet the requirements of the ROD and approximately at a cost of about 90 million dollars. The lower and upper bound of estimated (in situ) contaminated soil at Rattlesnake Creek is 15,000 yd^3 and 33,000 yd^3, with a best estimate of 22,000 yd^3. It is estimated that the remediation of the Rattlesnake Creek area will cost an additional 20 million dollars for the excavation and disposal of an estimated (in situ) contaminated soil volume of 22,000 yd^3.

B. References

The Rattlesnake Creek portion of the Ashland sites was part of the *Remedial Investigation/Feasibility Study for the Tonawanda Site* conducted by the Department of Energy (DOE 1993), and the *Record of Decision for the Ashland 1 (including Seaway Area D) and Ashland 2 Sites, Tonawanda, New York (ROD)* (USACE 1998). The *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997) describes the process used to develop the cleanup criteria documented in the ROD. Radiological data from the *Rattlesnake Creek Investigation Report – Uranium Sediment Concentrations and Dose Impact Analysis* (USACE 1999) indicated the need for surveys along Rattlesnake Creek. Other sources of information used to support the need for this ESD include the *Remedial Investigation for the Tonawanda Site* (DOE 1993), the *Uranium-238 Investigation, Rattlesnake Creek—Phase I* (USACE 1998), *Rattlesnake Creek Follow-up Sampling Plan* (IT 2001), *Rattlesnake Creek Investigation Summary Report* (IT 2001), *Rattlesnake Creek Follow-Up Investigation Report* (IT 2001), and the *Rattlesnake Creek Final Status Survey Plan* (USACE 2004).

IV. DESCRIPTION OF SIGNIFICANT DIFFERENCES

The remedy of excavation and offsite disposal as described in the Proposed Plan (PP) and ROD remains unchanged for the sediments in Rattlesnake Creek, although these sediments were not included in the PP and ROD. In addition, the same COCs will be addressed and the same remediation methods will be employed. The significant

differences are that a different cleanup guideline will be used in the field to insure that residual concentration of the COCs remaining at the site after excavation comply with the requirements of the ROD and the volume of material to be excavated and disposed and in order to comply with the requirements of the ROD will increase from the original estimated amount as will the cost to undertake the work.

V. SUPPORT AGENCY COMMENTS

Comments and responses from NYSDEC are presented in Appendix A.

VI. STATUTORY DETERMINATIONS

The selected remedy as modified in this ESD is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to hazardous substances which are part of this response action, and is cost-effective.

VII. PUBLIC PARTICIPATION COMPLIANCE

In accordance with National Contingency Plan 300.435 (C)(2)(ii), a notice, briefly summarizing the ESD was published in the *Tonawanda News* and *Kenmore Record* on September 20, 2004.

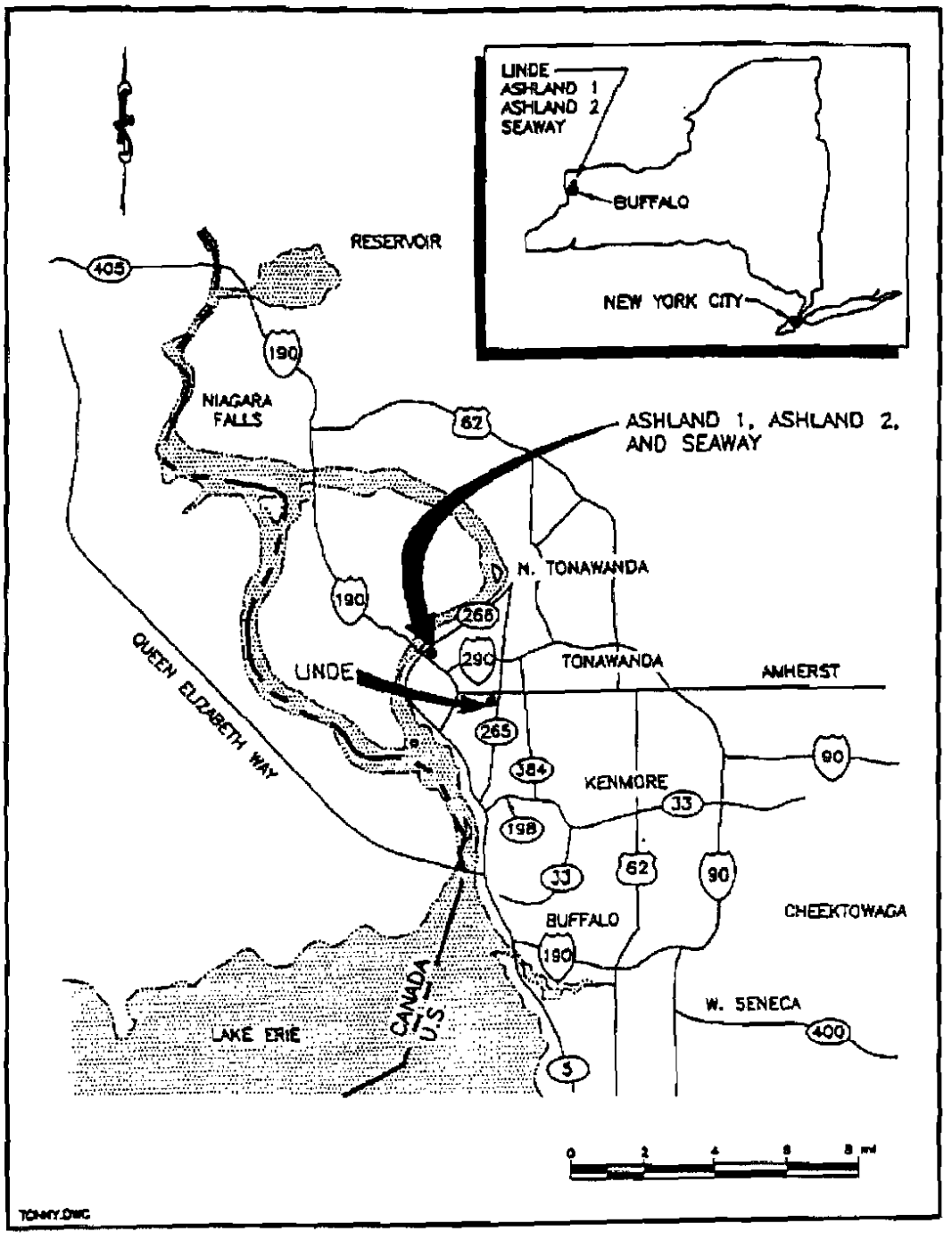

Figure 1. Location of the Town of Tonawanda, NY and the Ashland Sites

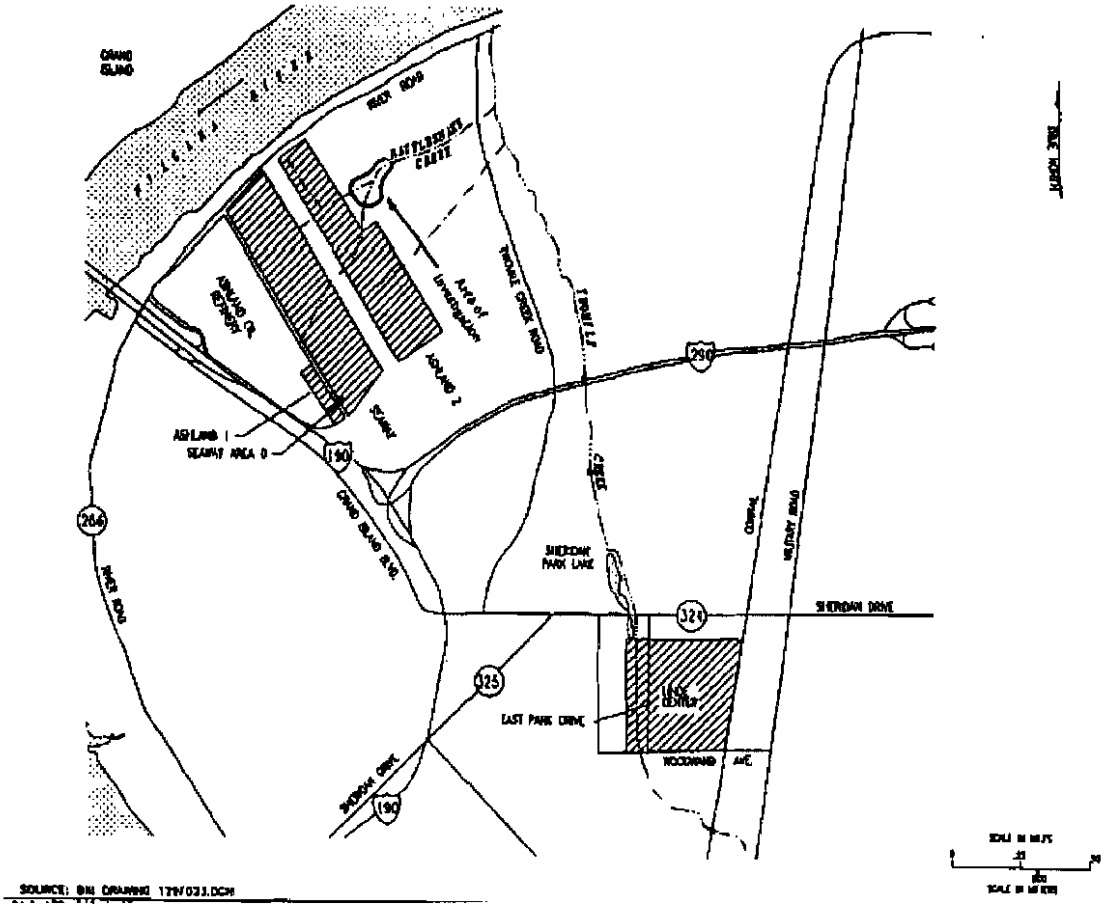

Figure 2. Locations of Ashland 1& 2, Seaway, Linde and Rattlesnake Creek

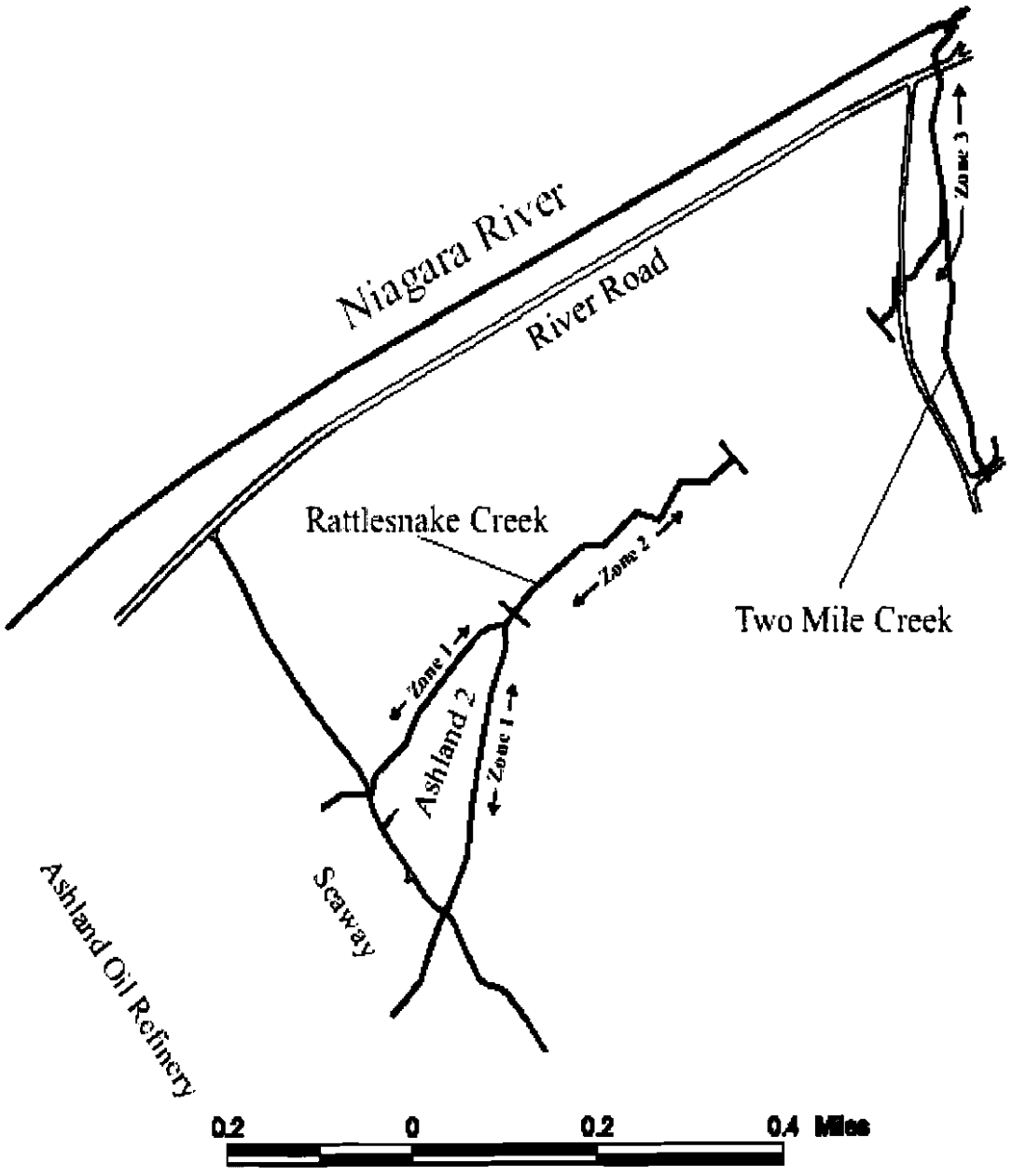

Figure 3. Rattlesnake Creek

APPENDIX A
SUPPORT AGENCY COMMENTS AND RESPONSES

I. INTRODUCTION

On October 17, 2003, the Buffalo District of the U.S. Army Corps of Engineers provided the *Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites, Tonawanda, New York*, dated October 20, 2003, to the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) for review and comment. This Responsiveness Summary addresses the written comments received on the document from EPA on November 3, 2003, and NYSDEC on November 17, 2003.

II. COMMENTS AND RESPONSES

New York State Department of Environmental Conservation (NYSDEC) Comment #1

The New York State Department of Environmental Conservation has reviewed the "Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites," which we received on October 22, 2003.

We agree that further investigation and remediation are needed in the Rattlesnake Creek area, and we support the Corps' intention to characterize and remediate contaminated soils there. However, we do not agree with the remediation criteria presented in this Explanation of Significant Differences. The Derived Concentration Guidance Levels (DCGL) for uranium-238 exceed the concentration at which uranium is subject to radioactive materials licensing, under both State and federal regulations [see 10 CFR 40.3 and 40.13(a)]. We recognize that some of the uranium contamination would be removed regardless of the uranium DCGL, because it is collocated with thorium-230. However, the Explanation of Significant Difference implies that the Corps would release the site for unrestricted use with generally licensed source material remaining on site. Therefore, we cannot concur with this Explanation of Significant Difference.

We recommend that the Corps revise the DCGL for uranium-238 to be consistent with applicable regulations for radioactive materials licensing and to ensure that the site will be suitable for unrestricted release.

U.S. Corps of Engineers – Buffalo District Response to NYSDEC Comment #1

We appreciate the concerns raised in this letter relative to the DCGL for uranium-238 in the Explanation of Significant Differences (ESD). The ESD was prepared consistent with EPA guidance for implementing actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and describes the adjustments to be made to the planned remedial action identified in the approved Record of Decision (ROD) to address new information for the site. Consistent with EPA guidance, the ESD only addresses those elements that need to be modified based on new information to implement the action identified in the ROD in a manner protective of human health and the environment. The radioactive contamination in the Rattlesnake Creek sediments was not known at the time the ROD was approved, and hence is addressed in this ESD. The DCGLs for the Rattlesnake Creek sediments were developed in a manner that followed the approach of the dose assessment for the Ashland sites, but was adjusted to be site-specific to account for a different activity distribution. This approach is consistent with EPA CERCLA guidance, and the details on the derivation of these DCGLs are provided in a separate document referenced in the ESD.

It is the intent of the U.S. Army Corps of Engineers (USACE) to conduct remedial actions in Rattlesnake Creek in a manner that is fully protective of human health and the environment consistent with current and projected future land uses. Previous cleanup actions at the Ashland 1 and 2 sites have resulted in residual radionuclide concentrations significantly below the DCGLs given in the ESD. At the Ashland 1 site, the post-remedial, site-wide average residual thorium-230, uranium-238, and radium-226 concentrations were 2.91pCi/g, 3.15 pCi/g, and 0.63 pCi/g respectively. The post-remedial, site-wide average residual thorium-230, uranium-238, and radium-226

concentrations were 5.17 pCi/g, 2.71 pCi/g, and 0.85 pCi/g respectively, at the Ashland 2 site. In addition, the USACE will conduct remedial actions in the Rattlesnake Creek area consistent with the "as low as reasonably achievable" policy required for federal actions involving exposures to radioactive materials. As such, it is expected that the resulting residual radionuclide concentrations will be significantly below the DCGLs identified in the ESD. In particular, the uranum-238 concentration is expected to be well below the 0.05% (by weight) concentration given in 10 CFR 40 (as identified in this letter) following remedial actions, as illustrated by previous remedial actions at the Ashland 1 and 2 sites.

U.S. Environmental Protection Agency (EPA) Comment #1

Section I, 4th and 5th paragraphs – It is unclear what is meant by the word "similar" when stating that USACE has used an approach similar to the one set forth in Title 10 Part 40 of the Code of Federal regulations. The benchmark dose method does not appear to be appropriate using the residual radium Ra-226 in soil found in 40 CFR 192. The DCGLs should be re-evaluated and a detailed risk assessment scenario ensuring that public dose does not exceed 25 mrem/yr TEDE should be submitted for review.

U.S. Corps of Engineers – Buffalo District Response to EPA Comment #1

Although the benchmark dose approach is not specifically mentioned in the Final Status Survey Plan (FSSP), Appendix B of the FSSP ("DCGL Development") does indicate that the dose assessment used to produce the DCGLs is "consistent with the other ARARs stated in the ROD, i.e., 40 CFR 192, which limits the concentration of radium-226 to 5 pCi/g within a 100 m^2 area". The benchmark dose approach is outlined in Appendix A of 10 CFR 40, and it directs that cleanup goals for radionuclides other than radium-226 found at uranium mill tailing sites be based on the dose associated with 5 pCi/g radium-226 in soil, which is the benchmark dose.

We did not use a benchmark dose approach in the ROD for the Ashland sites. Rather, DCGLs were based on a dose limit of 25 mrem/year for a residential scenario. Tbis approach resulted in a DCGL of 5 pCi/g of radium-226 in 100 m^2 of soil. Therefore, using the benchmark dose approach specified in Appendix A of 10 CFR 40 would have resulted in the same DCGLs derived in the FSSP for radionuclides other than radium-226.

EPA Comment #2

Section II.B, 2nd bullet—The 15 pCi/g Ra-226 concentration in subsurface soil should not be used as a cleanup level, it is meant to be a finding tool.

U.S. Corps of Engineers – Buffalo District Response to EPA Comment #2

As noted in the response to NYSDEC Comment #1, the ESD is limited to those elements that need to be modified on the basis of new information to implement the action in the approved ROD in a manner protective of human health and the environment. The 15 pCi/g subsurface cleanup level for radium-226 was listed in Section 4.2 because it is identified in the ROD.

Reviewer Name:	Wright, Ann L.
Discipline	Legal
CX Project Review No.	68718
Date:	18 July 2003
Project Location	Tonawanda, NY
Document Name:	Draft ESD for Rattlesnake Creek Portion of Ashland FUSRAP Sites

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1. The June 2003 draft Explanation of Significant Differences for the Rattlesnake Creek Areas of the Ashland 1 and 2 FUSRAP Sites has been reviewed. For the reasons stated below, I do not concur with the proposed ESD.

2. The ROD for the Ashland 1 and 2 sites was issued in March 1998. The selected remedial action established a cleanup level of 40 pCi/g Thorium-230 and provided for the excavation and off-site disposal of soils that exceed the cleanup level. Thorium-230 was the only COC identified for the site for which a cleanup level was established in the ROD. The cleanup level was developed in the DOE report "Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway" dated September 1997. This report determined that the UMTRCA Regulations at 40 CFR 192 for soil remediation of Radium-226, and comparable DOE Order standards, were relevant and appropriate due to the ore processing residuals that were the primary contamination at the Ashland Sites. A Thorium-230 standard was derived by calculations based on the Radium-226 soil standards of 5 pCi/g surface remediation and 15 pCi/g at depths of 15 cm each below the surface, all above background. The derivation report indicated it was based on data points and assumed volumetric distribution, but that it was biased toward the higher detections and would represent a conservative over-estimation of likely actual concentrations. The analysis compared Radium-226 to Thorium-230 to establish an appropriate cleanup level. The report validated the proposed level by also comparing residual risk using the CERCLA risk assessment method, and the dose using NRC dose calculation methods, considering industrial, construction or residential exposures. In all scenarios, the Thorium standard would be equivalent to the Radium-226 standard and within the acceptable ranges. The Ashland 1 and 2 ROD establishes that land use at the site is limited by local zoning and land development patterns to industrial use. The ROD identified the primary ARARs as UMTRCA, and its implementing regulations for soil cleanup standards, and also identified the NRC decommissioning criteria at 10 CFR 20, Subpart E. The latter ARAR identification is erroneous, as the NRC has determined that these two sets of regulations are not compatible and should not both be applied to the same site. *See* 10 CFR 20.1401(a) concerning inapplicability of these standards to sites subject to the NRC regulations at 10 CFR 40, Appendix A, which is the NRC soil remediation regulation that conforms to the standards in 40 CFR 192. *See also*, Supplementary Information to the NRC Final Rule for Radiological Criteria for License Termination, 62 Fed. Reg. 39058, 21 July 1997, stating that the decommissioning criteria are not comparable to the UMTRCA soils standards and the UMTRCA standard for soil would often result in doses higher than the decommissioning criteria, except that in practice soil removal usually results in actual residual concentrations that are lower than the regulatory limits and further that UMTRCA mandates the use of

standards established by EPA, which were promulgated in 40 CFR 192. Fundamentally, the ROD for these sites establishes the Thorium-230 cleanup criteria based on the UMTRCA regulations.

3. The proposed ESD would change the cleanup criteria in the Rattlesnake Creek portion of the site. It identifies three COCs, and proposes cleanup criteria for all three of them – Radium-226, Thorium-230, and Uranium-238. It states that the dose to a residential receptor based on the ROD cleanup criteria would not meet the NRC decommissioning regulation dose standard, and thus would not meet the threshold CERCLA criteria of compliance with ARARs. The document provides no justification for identification of additional COCs, no explanation of the development of the new proposed criteria other than to state that they are based on a residential exposure scenario. There is no justification for use of this land use assumption since the ROD determined that industrial use is the future use scenario for this site. The ESD provides no information on what additional volume of material would be included in the changed remedy and what the additional cost is for the change. It provides no information on how this relates to the primary ARAR, that is the UMTRCA soil standards and the original calculation of the derived cleanup level for Thorium-230.

4. Since the issuance of the ROD for this site, the NRC has promulgated a regulation at 10 CFR 40, Appendix A, Criterion 6(6), that provides a benchmark dose method to calculate cleanup levels for radionuclides other than Radium-226 at an UMTRCA site. Although it was not originally available at the time of this ROD, it is now a promulgated regulation and provides the most relevant and appropriate regulatory method for calculation of the cleanup levels for the Thorium-230 at the Rattlesnake Creek portion of this site, and also for calculating the appropriate cleanup levels for Uranium-238 or any other radionuclide COC that is identified for this site.

5. An ESD is allowed by the NCP to be used to provide for significant but not fundamental changes to a ROD. 40 CFR 300.435(c)(2). If there are fundamental changes to a ROD, a ROD amendment is required, using the same procedures that apply to a Proposed Plan and the original ROD as to public and support agency comments. The determination of whether a change requires an ESD or a ROD amendment requires consideration of the scope of the remedy, its performance, or its cost. Typically, increases of less than 100% in volume or cost due to encountering unexpected quantities of contamination, or reduction in performance period of a ROD, are the subject of an ESD. The addition of new COCs, and revision of cleanup levels, calls into question the adequacy of the original ROD and requires reconsideration of the scope of the remedy. This requires a ROD amendment. If the changes proposed in the draft ESD are necessary and appropriate, they undermine the basic remedy as to whether it still meets the threshold criteria of protection of human health and the environment and compliance with ARARs. Because the new NRC regulation for the benchmark dose has been promulgated since the original ROD, it must be considered at this point and should be identified as a new ARAR. The NRC decommissioning criteria should be removed from consideration as an ARAR for this site. All these changes are fundamental and require opening the original ROD.

6. It is not clear from the draft ESD what the status of the project is at this point and what change in the remedy implementation will be needed at the site, or why. It is recommended that the need for a remedy change be reconsidered. If the remedy described in Section 9 of the ROD is still adequate and the ROD reasonably describes the work to be done, a change may not be required. The ARARs that should be considered are the UMTRCA regulations, along with the new benchmark dose calculation method established by the NRC in 10 CFR 40, Appendix A, Criterion 6(6). If it appears that the

cleanup level used for the original ROD will not satisfy the ARARs, then the original remedy must be reevaluated to determine if it is still protective or if the site may require additional work. If the Thorium-230 standard will satisfy the ARARs and the ROD, but other COCs must be identified, then a ROD amendment will be necessary, at least for this area and any areas that appear to be affected by the same new contaminant(s). If no changes to the cleanup criteria or COCs are required, but it is expected that additional volumes will be excavated in this area, and the volumes are a fractional addition to the original estimated quantities, an ESD may be used to inform the public of this change and that no other changes to the remedy are required. If there are any questions on this opinion, I may be contacted at 402-697-2466.

Ann L. Wright

HTRW CX Counsel

CF

CENWO-HX-S(Hines)

CELRB-OC(Barczak)

CELRD-OC(Kelley)

Reviewer Name:	Bass, Sam
Discipline	Geology
CX Project Review No.	5847.68718
Date:	7/28/2003
Project Location	Tonawanda, NY
Document Name:	Draft Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites

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Comment # 1: Page 3, Section III.A., first paragraph, penultimate sentence. Suggest you rephrase the term "...where the creek disappears in the pond area." This implies we don't know where the creek flows. Suggest it be changed to read "...where the creek flows into the pond area and continues underground."

7.0 DOCUMENTING POST-ROD CHANGES: MINOR CHANGES, EXPLANATIONS OF SIGNIFICANT DIFFERENCES, AND ROD AMENDMENTS[1]

7.1 EVALUATING POST-RECORD OF DECISION INFORMATION

After a ROD is signed, new information may be received or generated that could affect the implementation of the remedy selected in the ROD, or could prompt the reassessment of that remedy.[1] The information could be identified at any time during, immediately prior to, or after the implementation of the remedy. Where information is submitted by a PRP, the public, or the support agency after a ROD is signed, the lead agency must consider and respond to this information and place such comments and responses in the Administrative Record file when *all* of the following criteria are met (per NCP §300.825(c)):

- Comments contain significant information;
- The new information is not contained elsewhere in the Administrative Record file;
- The new information could not have been submitted during the public comment period; and
- The new information substantially supports the need to significantly alter the response action.

The lead agency also may evaluate whether a remedy change is warranted on its own merits, even where the requirements of NCP §300.825(c) are not triggered.[2]

7.2 TYPES OF POST-RECORD OF DECISION CHANGES

The lead agency's categorization of a post-ROD change to the Selected Remedy is a site-specific determination and must consider the following as set out in NCP §300.435(c)(2).

- *Scope.* Does the change alter the scope of the remedy (*e.g.*, type of treatment or containment technology, the physical area of the response, remediation goals to be achieved, type and volume of wastes to be addressed)?
- *Performance.* Would the change alter the performance (*e.g.*, treatment levels to be attained, long-term reliability of the remedy)?
- *Cost.* Are there significant changes in costs from estimates in the ROD, taking into account the recognized uncertainties associated with the hazardous waste engineering process selected? (Feasibility Study cost estimates are expected to provide an accuracy of +50 percent to -30 percent.)

Based on this evaluation, and depending on the extent or scope of modification being considered, the lead agency must make a determination as to the type of change involved (*i.e.*, nonsignificant or minor, significant, or fundamental change). Remedy changes should fall along a continuum from minor to fundamental. Similarly, an aggregate of nonsignificant or significant changes could result in a fundamental change.

Post-ROD changes fit into one of the three following categories:

- *Nonsignificant or Minor Changes* usually arise during design and construction, when modifications are made to the functional specifications of the remedy to address issues such as performance optimization, new technical informa-

[1] It is EPA's policy to encourage appropriate remedy changes in response to advances in remediation science and technology (*Superfund Reforms: Updating Remedy Decisions*, (EPA 540-F-96-026, September 1996).

[2] Responding to post-ROD comments submitted by PRPs, the public, or the support agency may only require a general overview of the comments and a simple EPA response if no change to the remedy is involved or the change is minor (see *Answers to Comments Submitted After the Superfund ROD Is Signed*, EPA memorandum, October 11, 1995, http://es.epa.gov/oeca/osre/951011. html). However, a formal public comment period may be conducted depending upon whether the change is significant or fundamental (for definitions of these types of changes see Section 7.2).

Highlight 7-1: Examples of Post-Record of Decision Changes

(NOTE: Examples are not meant to present strict thresholds for changes in cost, volume, or time.)

Minor Changes

- **Small Increase in Volume:** Remedial design testing shows that the volume of soil requiring treatment is 75,000 cubic yards rather than the 60,000 estimated in the ROD, but the estimated cost of the overall remedy will only increase by a small percentage.

- **Disposal Location:** During remedial design, it is discovered that it is not feasible to construct the on-site landfill (which is part of the Selected Remedy) in the location specified in the ROD. However, another similar location at the site is suitable for a landfill, and this location is chosen.

- **Ground-Water Monitoring:** The Selected Remedy calls for long-term pump and treat of contaminated ground water with monitoring on a quarterly basis. After a period of time, a determination is made that no significant change in data quality or monitoring effectiveness will occur if monitoring contaminant levels in the ground water is less frequent. Ground-water monitoring is changed to semi-annual sampling.

Significant Changes

- **Large Increase in Volume/ Cost Increase:** Sampling during the remedial design phase indicates the need to significantly increase the volume of contaminated waste material to be incinerated in order to meet selected cleanup levels, thereby substantially increasing the estimated cost of the remedy.

- **Disposal Location:** The lead agency determines that it is not feasible to construct an on-site landfill for treated waste in accordance with the remedy selected in the ROD. The treated wastes must be sent to an off-site landfill. Although the overall management approach for the treated waste (landfill disposal) will remain the same, the costs and implementation time will increase significantly.

- **Contingency Remedy:** As part of an active ground-water pump and treat system, contaminant concentrations decrease to an asymptotic level which is close to attainment of the cleanup level. Investigation shows that adding additional wells to pump and treat ground water will not improve the performance of the remedy in attaining the cleanup level. The ROD included contingency language that the pump and treat remedy would continue operating until contaminant levels were reduced by at least 90%. At such time, monitored natural attenuation would be relied upon to attain the cleanup levels specified in the ROD (if performance monitoring data indicated that this would be an effective method of achieving the final cleanup levels). A decision is made to implement the contingency, thus changing the remedy from pump and treat to monitored natural attenuation. This represents a significant change in achieving the cleanup levels at the site.

- **New ARAR Promulgated (Impacts on Cleanup Levels and Other Parameters):** The lead agency determines that the attainment of a newly promulgated requirement is necessary, based on new scientific evidence, because the existing ARAR is no longer protective. Although this new requirement will significantly change the remedy (*i.e.*, cleanup level, timing, volume, or cost), it will not fundamentally alter the remedy specified in the ROD (*i.e.*, the selected technology will not change) and it will not impact the level of protection (*i.e.*, risk reduction) that the remedy will provide.

- **Land Use:** During remedial design, the local zoning board decides to change the current land use from residential to commercial. Although this new requirement will significantly change features of the remedy (*i.e.*, determination of principal or low level threats, reasonable risk scenarios, appropriate cleanup levels), it will not fundamentally alter the remedy specified in the ROD (*e.g.*, the selected technology will not change).

- **Secondary Technology:** The lead agency decides to use a biological treatment method instead of air stripping (which was specified in the ROD) for ex-situ treatment of extracted ground water. The basic pump and treat approach remains unaltered and the cleanup level specified in the ROD will be met by the alternate technology; the change is significant, but not fundamental. [See *Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites* (EPA 540-R-96-023, October 1996).]

should consult with the support agency, as appropriate, before issuing an ESD (NCP §300.435(c)(2)). Although not specifically required by CERCLA §121(f) and NCP §300.435(c)(2)(i), it is also recommended that the lead agency provide the support agency the opportunity to comment, and summarize the support agency's comments in the ESD. The lead agency also must publish a notice of availability and a brief description of the ESD in a major local newspaper of general circulation (as required by NCP §300.435(c)(2)(i)(B)). The ESD must be made available to the public by placing it in the Administrative Record file and information repository (NCP §§300.435(c)(2)(i)(A) and 300.825(a)(2)). A formal public comment periodis *not* required when issuing an ESD.

In some cases, an additional public comment period or public meeting may be held voluntarily on a planned ESD (NCP §300.825(b)). This may be useful where there is considerable public or PRP interest in the matter. The Office of Emergency and Remedial Response (OERR) recommends issuing the ESD in a fact sheet format as outlined in Highlight 7-2. The Regional Administrator (or their designee) must sign an ESD. In such cases it may be appropriate to delay implementation of the remedy relating to the ESD to allow a consideration of possible concerns.

7.3.3 Documenting Fundamental Post-ROD Changes: ROD Amendment

When a fundamental change is made to the basic features of the remedy selected in a ROD with respect to scope, performance, or cost, the lead agency is required to develop and document the change consistent with the ROD process (NCP §§300.435(c)(2)(ii)(A) through (H)). This entails the issuance of a revised Proposed Plan that highlights the proposed changes. An amended ROD that documents the change follows the Proposed Plan. The portion of the ROD being amended is evaluated using the nine criteria, focusing on those central to the rationale for the Selected Remedy.

In general, the introductory sections of the ROD do not need to be readdressed in the ROD Amendment but may be referenced from the previous ROD. The focus of the amendment should be to document the rationale for the amendment and provide assurances that the proposed remedy satisfies the statutory requirements. This is accomplished through an evaluation, utilizing the nine criteria, of the portion of the remedy being changed.

To describe the nature of the changes, it is suggested that a side-by-side comparison of the original and proposed remedy components be used to clearly display the differences.

The information included in a ROD Amendment is a function of the type of change made and the rationale for that change. If the amended ROD addresses the entire response action for the site or a series of operable units (*e.g.*, soil, surface water, ground water), only the portion of the remedy that is being changed (*e.g.*,ground water) requires an amendment. For the portion of the ROD being amended, a new nine-criteria analysis, including a new ARARs analysis, will be necessary (see NCP §300.430(f)(1)(ii)(B)(2)). Portions of the analysis in the original ROD can be cross-referenced, where appropriate. RD/RA activities being conducted on other portions of the site or at operable units not proposed for changes may continue during the amendment process.

When fundamental changes are proposed to the ROD, the lead agency must conduct the public participation and documentation procedures specified in NCP §§300.435(c)(2)(ii) and 300.825(a)(2). This would include issuing a revised Proposed Plan that highlights the proposed changes. The format should follow that of the Proposed Plan described in Chapter 3. The final decision to amend is not made until after consideration of public comment (NCP §300.435(c)(2)(ii)).

If a fundamental change is made after a consent decree has been entered at an enforcement-lead site, the decree may need to be modified to conform to the amended ROD, and perhaps involve the Department of Justice or the Court. RPMs should check with their Regional Counsel on how this may be accomplished.

ROD Amendments, like RODs, must be signed by the Regional Administrator (or their designee). A recommended outline and checklist can be found in Highlight 7-2.

Highlight 7-1: Examples of Post-Record of Decision Changes (continued)

- **Institutional Controls:** During a five-year review, the lead agency reviews institutional control measures implemented at the site and determines that additional measures, that differ significantly from what was described in the ROD, are necessary to be protective (*e.g.*, need for an easement to replace a deed notice).

- **Change in ARARs:** At a five-year review, it is determined that a cleanup level is not consistent with an updated State cleanup standard, and thus is not protective and needs to be modified. This change will not cause a fundamental change in the volume of waste to be remediated.

Fundamental Changes

- **Change Primary Treatment Method:** The in-situ soil washing remedy selected in the ROD proves to be infeasible to implement after testing during remedial design. A decision is made to fundamentally change the remedy to excavate and thermally treat the waste.

- **Change Primary Treatment Method with Cost Increase:** Additional information obtained during remedial design testing demonstrates that the Selected Remedy for ground water, monitored natural attenuation, will not meet cleanup levels, as had been originally predicted in the RI/FS. The lead agency decides to fundamentally change the remedy from monitored natural attenuation to pump and treat. The estimated cost of the cleanup increases significantly.

- **Change Primary Treatment Method with Cost Decrease:** Pump and treat is the Selected Remedy for ground water. Prior to construction of a pump and treat system, interested parties collect and present ground-water information to the lead agency showing that contaminant concentrations are decreasing due to natural processes (*e.g.*, biodegradation, dilution, adsorption, dispersion). Modeling indicates that monitored natural attenuation will achieve cleanup levels in a time frame comparable to pump and treat at substantially less cost.

- **Change from Containment to Treatment with Cost Increase:** At a five-year review for a small industrial site, tests indicate that the containment remedy will not be protective and now a more active response approach (*e.g.*, treatment) is necessary. A new remedy must be selected that will meet protectiveness requirements, resulting in unanticipated costs for the site.

- **Technical Impracticability Waiver:** While implementing an active pump and treat remedy, the presence of DNAPL is discovered. A determination is made to invoke a Technical Impracticability Waiver of the ARAR because treatment of the DNAPL zone is impracticable from an engineering perspective. Rather than treat the source material (DNAPL) a decision is made to implement a containment approach (*e.g.*, slurry wall) for the DNAPL zone. Pump and treat will continue outside the containment zone. As a result, the scope, performance, and cost of the original remedy is fundamentally changed.

- **Community Preference:** The original remedy selected in the ROD was on-site incineration of contaminated soils with estimated costs of $50 million. The community opposes the building of an incinerator and requests that an alternate remedy be selected. New information received after the ROD was signed demonstrates that thermal desorption can meet the cleanup goals in a reasonable time frame for less cost with no loss in protection. This change is based on the community's preference for an alternative to the original Selected Remedy.

- **Volume Decrease Changes Primary Treatment Method:** The Selected Remedy called for treatment by lead recovery and recycling of lead contaminated materials. Additional investigation in design showed the volume of waste to be smaller than originally presumed. The decrease in volume made recycling uneconomical. The amended remedy calls for treatment and containment such that waste is stabilized and consolidated in a lined and capped on-site containment facility. The scope of the new remedy is more efficient, is cost-effective, and is supported by the State and the community.

tion, support agency/community concerns and/or cost minimization (*e.g.*, value engineering process). Such changes may affect things such as the type or cost of materials, equipment, facilities, services, and supplies used to implement the remedy. The change will not have a significant impact on the scope, performance or cost of the remedy.

- *Significant Changes* generally involve a change to a component of a remedy that does not fundamentally alter the overall cleanup approach.

- *Fundamental Changes* involve an appreciable change or changes in the scope, performance, and/or cost or may be a number of significant changes that together have the effect of a fundamentalchange. An example of a fundamental change is one that results in a reconsideration of the overall waste management approach selected in the original ROD.

Highlight 7-1 provides examples of post-ROD changes. (See also NCP preamble, 55 FR 8772 for more information.) Please note that the examples presented in Highlight 7-1 are not meant to present strict thresholds for changes in cost, volume, or time.

7.3 DOCUMENTING POST-RECORD OF DECISION CHANGES

The type of documentation required for a post-ROD change depends on the nature of the change. Changes that significantly or fundamentally affect the remedy selected in the ROD will require more explanation and/or opportunity for public comment than those that do not. Each type of post-ROD change is associated with one of three documentation procedures: (1) a memo or note to the post-ROD file for an insignificant or minor change; (2) an explanation of significant differences (ESD) for a significant change, and (3) a ROD amendment for a fundamental change. Sample outlines for ESDs and ROD Amendments are provided in Highlight 7-2.

7.3.1 Documenting Non-Significant (or Minor) Post-ROD Changes: Memo to the Site File

Any non-significant or minor changes should be recorded in the post-ROD site file (*e.g.*, the RD/RA case file). If the lead agency chooses, non-significant changes can also be documented for the public in a Remedial Design Fact Sheet. Although not legally required, a written statement describing the change is generally recommended (See "*Answers to Comments Submitted After the Superfund ROD is Signed*," EPA memorandum, October 11, 1995, http://es.epa.gov/oeca/osre/951011. html).

7.3.2 Documenting Significant Post-ROD Changes: Explanation of Significant Differences

When documenting significant changes made to a remedy, the lead agency must comply with CERCLA §117(c) and NCP §§300.435(c)(2)(i) and 300.825(a)(2). An ESD must describe to the public the nature of the significant changes, summarize the information that led to making the changes, and affirm that the revised remedy complies with the NCP and the statutory requirements of CERCLA.

To describe the nature of the significant changes, it is suggested that a side-by-side comparison of the original and proposed remedy components be used to clearly display the significant differences.

The ESD should provide additional information on changes that have resulted in the remedy as a result of the change (*e.g.*, changes in the cleanup cost estimate or remediation time frame). Generally, a new nine-criteria analysis is not required; however, the ESD should include a statement that the ROD remains protective and continues to meet ARARs (NCP §§300.430(f)(1)(ii)(B)(1) and (2)).[3] It is also generally appropriate to prepare an ESD document when the lead agency decides to exercise a contingency remedy that was previously described in the ROD (see Section 8.3).

While the ESD is being prepared and made available to the public, the lead agency may proceed with the pre-design, design, construction, or operation activities associated with the remedy. The lead agency

[3] An ESD does not generally reopen consideration of ARARs for the remedy since an ESD does not fundamenrally change the remedy. However, if an ESD results in the addition of any new components to the remedy, any ARARs that apply to the change that the ESD describes must be discussed and met or waived. For example, if any ARARs apply to an ESD change which adds stabilization of residuals to a thermal treatment remedy, they must be discussed in the ESD and met or waived.