

404802

**AMENDMENT TO THE RECORD OF DECISION
LORD OPERABLE UNIT
SAEGERTOWN INDUSTRIAL AREA SUPERFUND SITE**

I. INTRODUCTION

Site Name: Saegertown Industrial Area Superfund Site

Site Location: Saegertown, Crawford County, Pennsylvania

Lead Agency: U.S. Environmental Protection Agency, Region 3 ("EPA" or "the Agency")

Support Agency: Pennsylvania Department of Environmental Protection ("PADEP")

A Record of Decision ("ROD") for the Saegertown Industrial Area Superfund Site was issued on January 29, 1993 ("1993 ROD"). This Amendment No. 1 to the ROD for the Lord Operable Unit ("Amendment No. 1") is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, ("CERCLA"), 42 U.S.C. § 9617(c), and 40 C.F.R. § 300.435(c)(2)(ii). This Amendment No. 1 has been prepared to document the nature of the change made to the selected remedy identified in the ROD; to summarize the information that led to the making of the change; and to affirm that the revised remedy complies with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621. Amendment No. 1 fundamentally alters the remedy selected in the 1993 ROD with respect to scope, performance and cost. This modification to the 1993 ROD and all supporting documents, including EPA's response to public comments are incorporated into the Administrative Record for the Site.

This Amendment No. 1 modifies the cleanup proscribed in the 1993 ROD by eliminating the requirement to extract and treat groundwater and implement air sparging/vacuum extraction in the source area. Instead, this Amendment requires: enhanced bioremediation of volatile organic compounds ("VOCs") in groundwater using a molasses-based carbon source and analysis of bioattenuation parameters and water quality to monitor performance; on-going operation and monitoring of the PW7 domestic well treatment system; and institutional controls, in the form of safety and health management planning and groundwater use restrictions. The original 1993 ROD also required that contamination in the groundwater be reduced to background levels. This Amendment changes the groundwater cleanup Performance Standards for site-related contaminants to the Maximum Contaminant Levels ("MCLs") identified in the Safe Drinking Water Act ("SDWA"). In addition, Preliminary Remediation Goals were also established as Performance Standards for several contaminants at levels below the SDWA MCLs and PADEP Media-Specific Concentrations to insure that the risk does not exceed EPA guidelines (cancer risk in excess of 1 in 10,000 or a Hazard Index greater than 1).

II. SUMMARY OF THE SITE HISTORY AND SELECTED REMEDY

The Saegertown Industrial Area Site ("Site") is an industrial park located in the Borough of Saegertown, Crawford County, Pennsylvania. The Site is approximately 100 acres in size and is located in a broad valley formed by the stream terrace of French Creek. It is bordered to the west by the elevated railroad bed of the Erie-Lackawana Railroad. Beyond the railroad tracks to the west lies the heavily populated area of Saegertown and French Creek. Woodcock Creek borders the Site to the south. Rural residential and agricultural lands border the Site to the north and east, respectively.

The industrial park consists of four main areas: the Lord Corporation property; the Saegertown Manufacturing Corporation property; the Spectrum Controls Incorporated property; and the properties that were formerly owned by the General American Transportation Company. Remediation has been completed at the properties that were formerly owned by the General American Transportation Company. Remediation was not required at the Saegertown Manufacturing Corporation property nor the Spectrum Controls Incorporated property. The Lord Corporation property is the subject of this ROD Amendment.

In 1991, during the Remedial Investigation/Feasibility Study ("RI/FS"), the Lord Corporation ("Lord") discovered a source of VOCs released at the Site associated with the RG-1 Sump Area. Subsequently, Lord implemented a removal of the RG-1 sump, modified the sewer system to eliminate the need for this sump, and excavated impacted soil to address the source of the contamination.

During the RI, five monitoring wells and 23 temporary well points were installed and two phases of groundwater sampling for VOC analysis were completed for delineation of suspected VOCs at the Site. In a study outside the RI, but included as an appendix in the RI, Remcor, Inc. conducted soil gas and groundwater sampling from temporary well points installed in the RG-1 Sump Area, the suspected source area of VOCs at the Site, to assess a leak from the wastewater containment sump. The following findings from the RI and RG-1 sump area investigations were considered in developing the Site Conceptual Model ("SCM") used in screening remedial technologies in the 1992 FS:

- Site geology consists of 45 to 50 feet of sand and gravel overlying shale bedrock;
- Groundwater is present at 4 to 15 feet below the land surface ("bls");
- Groundwater flows primarily from east to west toward French Creek and a component of groundwater flows to the southwest toward Woodcock Creek;
- Site groundwater contains chlorinated VOCs due to a release from the RG-1 sump;
- Potential that dense non-aqueous phase liquid ("DNAPL") exists in the vicinity of the RG-1 sump, based on 1991 VOC concentrations;
- Concentrations of organic contaminants in Site groundwater pose a risk to human health and the environment if groundwater is used for ingestion, inhalation or dermal contact;
- Migration of VOCs in groundwater is estimated to range from 0.54 to 2.52 feet per year, based upon measurements of hydraulic gradient and permeability;
- No aquitards or aquichudes were identified beneath the Site; and
- VOCs in groundwater are not adversely affecting surface water quality in French Creek, based on surface water and sediment samples.

Using the SCM, potentially applicable remedial technologies were screened in the FS to address the following Remedial Action Objectives:

- Provide adequate protection against (1) human consumption of water containing carcinogens and non-carcinogens in excess of the SDWA Maximum Contaminant Levels, (2) a total cancer risk for all carcinogens of greater than 10^{-4} to 10^{-6} and (3) a total hazard index of greater than 1;

- Aquifer restoration to conform to Applicable or Relevant and Appropriate Requirements ("ARARs");
- Prevent migration of contaminated groundwater to French and Woodcock Creeks; and
- Reduce or eliminate migration of subsurface contaminants to the groundwater.

Based on the RI SCM and the FS screening of potentially applicable remedial technologies, EPA issued a ROD on January 29, 1993 with the following components to address contamination on the Lord Corporation property:

- Delineation of the groundwater plume (Pre-Remedial Design Investigation);
- Groundwater extraction and treatment through air stripping or ultraviolet/oxidation, with off-Site discharge of the treated effluent to French Creek;
- Installation of air sparging wells in the source area (RG-1 sump area) with vapor extraction and treatment through carbon adsorption for VOCs; and
- Long-term groundwater monitoring.

The Performance Standards that were required by the 1993 ROD were the lower of either the background concentration (defined as the laboratory method detection limit) or the SDWA MCL for each VOC. The ROD did, however, identify a concern regarding whether background levels are attainable, and included a technical impracticability provision if asymptotic conditions prevailed within the plume. If asymptotic conditions were encountered, EPA could require long-term gradient control pumping for containment, a waiver of a chemical-specific ARAR, utilization of institutional controls and/or the re-evaluation of remedial technologies.

III. REASONS FOR ISSUING ROD AMENDMENT No. 1

Following the issuance of the 1993 ROD and the Administrative Order on Consent (EPA Docket No. III-93-47-DC, dated August 1993), Lord began the Pre-Remedial Design ("Pre-RD") Investigation to further evaluate the hydrogeology and assess groundwater quality. The primary objective of the Pre-RD Investigation was to develop a better understanding of the SCM so an effective and practicable remedial action could be implemented at the Lord Site.

Lord performed investigations in four distinct phases, based on the need to address unique issues that arose during project implementation. The first phase (1993 through early 1995) was focused on collecting Site-specific data regarding hydrogeology and the nature and extent of the VOCs to ensure that the remedial technologies required by the 1993 ROD could be designed and effectively implemented. During the first phase it was determined that the remedial technologies selected in the 1993 ROD might not be implementable or effective in mitigating the VOCs in groundwater due to conditions at the Site. The second phase (early 1995 through 1996) focused on re-evaluating potential remedial strategies for the Site, including intrinsic bioattenuation. During this period, Lord also completed remediation of a secondary VOC source beneath the West Tank Farm. The third phase (conducted in 1997) focused on the on-going intrinsic bioattenuation and an evaluation of potential exposure pathways (surface water and domestic wells). The fourth phase (1998 to the present) defined a broader Study Area encompassing the west side of French Creek when it was determined that a domestic well west of the Creek contained vinyl chloride in excess of the MCL.

In addition to the four investigation phases described above, Lord initiated a voluntary Pilot Study to assess the feasibility of enhancing the naturally occurring reductive dechlorination processes to remediate VOCs in

groundwater. Based on the Pre-RD Investigation and the Pilot Study, new and additional information have facilitated the following significant changes to the SCM:

- A heterogeneous lithology is present beneath the Site, with interbedded layers of silts and clays present in the areas with elevated VOCs;
- The concentration of VOCs within the plume are lower than projected and there is no evidence of dense non-aqueous liquids;
- Residual VOCs are significantly less than previously estimated;
- Pilot testing the air sparging/vapor extraction technology at the Sump Area identified soils with low permeability which reduced the effectiveness of the system to capture VOCs;
- Pump testing revealed a semi-confined aquifer with layers of lower permeability material that would retard the movement of VOCs in groundwater;
- Pump and treat would be less effective than predicted in the FS due to the low permeability materials;
- Effluent from the pump and treat facility meeting the water quality limits stated in the draft National Pollution Discharge Elimination System ("NPDES") permit for the Site could adversely affect endangered mussels within French Creek;
- Currently, French Creek is not being adversely affected by the discharge of VOCs to the surface water via seeps and groundwater;
- VOCs were identified in groundwater immediately above bedrock on the east bank of French Creek and in groundwater sampled from the weathered bedrock on the West bank of French Creek.
- Domestic well PW7, located adjacent to the west bank of French Creek, was identified as containing vinyl chloride above the MCL; and
- Groundwater data from 26 residential wells indicates that only PW7 contains VOCs above MCLs.

Lord immediately began providing bottled water to the affected residence and installed a domestic well treatment system ("PW7 Treatment System"), as required by a Unilateral Administrative Order ("UAO") issued by the EPA on February 13, 1997. This domestic well treatment system (loaned to Lord by PADEP) has been operating since May 1997 and has proven to be effective at removing the VOCs from the groundwater.

A second VOC source area was discovered at the West Tank Farm in 1996 and approximately 800 cubic yards of soil were excavated and placed in an aboveground-engineered soil pile for enhanced biological treatment (biopile). Treatment levels, as required by the Pennsylvania Department of Environmental Protection, were attained within one year, and the biopile was closed. An in-situ bioventing system was installed to address residual VOCs present in soils that were left below the West Tank Farm foundations. In less than one year, the system showed an average decrease of approximately 98 percent in soil vapor concentrations. The system was shut down so that the laterals could be used for carbon introduction in the voluntary Pilot Study that began in February 1998.

Between 1995 and 1997, Lord conducted an assessment of the natural attenuation of chlorinated VOCs and identified significant evidence that biodegradation of the VOCs was naturally occurring within and

downgradient of the former source areas. Biodegradation of the VOCs has been demonstrated to be an important component of the VOC attenuation that is occurring at the Site. The data indicate that VOCs are being naturally degraded from the parent compounds, PCE and TCE, to the daughter compounds, cis-1,2-DCE and vinyl chloride, and finally to ethene and ethane. The biogeochemical indicator parameters provide evidence that these reductions are due to biotic processes, especially in areas of the Site where sources of organic matter are present and more reducing conditions have developed.

A Pilot Study was initiated by Lord in 1998 to evaluate whether the introduction of molasses as a source of carbon could enhance the reductive dechlorination of the VOCs in groundwater. The data demonstrate that the established conditions are effective at enhancing the biodegradation of the VOCs which are degraded to innocuous end products. It appears that the proper reducing conditions can be developed at the Lord Site when a sufficient volume of molasses-based carbon source is added to the aquifer, and once developed, the reduction of the chlorinated VOCs can be driven through to completion.

IV. MODIFIED REMEDY

In consideration of new information that became available after signing the 1993 ROD, several modifications to the remedy have been developed to achieve the Remedial Action Objectives. The modified remedy eliminates two components of the original remedy: (1) extraction and treatment of groundwater and (2) air sparging/vacuum extraction. The modified remedy includes the following three new components:

- Enhanced bioremediation of VOCs in groundwater using a molasses-based carbon source and analysis of bioattenuation parameters and water quality to monitor performance;
- On-going operation and monitoring of the PW7 domestic well treatment system;
- Institutional controls, in the form of safety and health management planning, and groundwater use restrictions.

This modification to the 1993 ROD also changes the Performance Standards for remediating groundwater. The updated cleanup standards identify the SDWA MCLs as the chemical-specific ARARs for the modified remedy. Preliminary Remediation Goals were also established as Performance Standards for several contaminants at levels below the SDWA MCLs and PADEP Media-Specific Concentrations to insure that the risk does not exceed EPA guidelines (cancer risk in excess of 1 in 10,000 or a Hazard Index greater than 1).

On-going groundwater monitoring within the Study Area from appropriate monitoring wells and domestic wells will continue as originally selected in the 1993 ROD. The three new components of this ROD Amendment No. 1 are described in greater detail below:

Enhanced Bioremediation

Full-scale implementation of this technology will involve the installation of additional carbon source introduction points such as vertical introduction wells or horizontal introduction laterals, depending on Site constraints. Groundwater contamination source areas will be evaluated during the Remedial Design as potential introduction points to ensure source areas are directly remediated. Once installed, the molasses-based carbon source solution will be introduced in a batch process at a frequency necessary to maintain the proper reducing conditions. Monitoring will be conducted periodically through the collection of field parameters and groundwater samples for analysis of select biogeochemical indicator parameters. This data will be used to monitor progress and determine whether sufficient carbon is being introduced to support the necessary reducing conditions. The downgradient mass of VOCs, including VOCs in the weathered bedrock, will attenuate

naturally as the VOCs near the source are remediated. This attenuation will be the result of several naturally occurring mechanisms, including degradation, dispersion, dilution and adsorption. Downgradient monitoring of groundwater, seeps and possibly surface water will be required to demonstrate the effectiveness of natural attenuation. The Remedial Design will evaluate the extent of groundwater contamination and evaluate the need for, and, if necessary, the location of, additional downgradient monitoring wells to ensure the plume of contaminated groundwater is fully defined and monitored throughout the cleanup.

The introduction system can be expanded to additional locations and/or the frequency modified to address areas that may require additional treatment. This allows for significant flexibility as the project moves forward if future groundwater monitoring indicates that the proposed remedial action is not adequately addressing Site conditions. In regard to the downgradient mass of VOCs, if progress toward decreasing VOC concentrations is not demonstrated, Lord will evaluate improvements designed to remediate downgradient VOCs more effectively to enhance the natural attenuation of these downgradient constituents. This may include injecting molasses downgradient of the Lord property or the creation of an oxidation zone to ensure the complete breakdown of contaminants prior to their reaching French Creek.

Domestic Well Treatment and Monitoring

The domestic well treatment system located on the west side of French Creek (PW7) will continue to be operated and maintained. This system consists of sock filters, a water softener, tray aerator, carbon polishing unit and a cotton filter. This treatment system has demonstrated its effectiveness at removing the levels of VOCs to non-detectable concentrations below drinking water MCLs. Upkeep, maintenance and routine sampling of the treatment system effluent will continue to be conducted. Residential wells in the vicinity of the PW7 on the west side of French Creek will be monitored and an appropriate response that is protective of human health and the environment (i.e., filter(s), treatment unit, alternate supply) shall be taken in response to any additional VOC impacts.

Institutional Controls

Institutional controls will be used to minimize the potential for future exposure to VOCs in groundwater during the remediation period. Lord will maintain its on-going health and safety program to ensure that proper supervision, monitoring and use of personal protective equipment is continued during any future excavation activities at the Site where groundwater may be encountered. Also, the Borough of Saegertown Ordinance (Ordinance Number 4, Series 1979) that prohibits the installation of future groundwater supply wells will be relied on to control potential exposures to VOCs in groundwater between Lord's property and French Creek.

V. COMPARISON OF THE ROD SELECTED REMEDY AND THE MODIFIED REMEDY ACCORDING TO NCP CRITERIA

The original 1993 ROD and the remedy set forth in this ROD Amendment No. 1 ("the modified remedy") have been compared according to the nine criteria in the NCP, 40 C.F.R. § 300.430(e)(9), as set forth in "*Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*" (October 1988) and "*Guidance on Preparing Superfund Decision Documents: The Proposed Plan, The Record of Decision, Explanation of Significant Differences, and the Record of Decision Amendment*" (EPA/540/6-89/007, July 1989 Interim Final). These nine evaluation criteria can be further categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria, as follows:

Threshold Criteria

- Overall protection of human health and the environment
- Compliance with applicable or relevant and appropriate requirements ("ARARs")

Primary Balancing Criteria

- Long-term effectiveness
- Reduction of toxicity, mobility or volume through treatment
- Short-term effectiveness
- Implementability
- Cost

Modifying Criteria

- Community Acceptance
- State Acceptance

These nine evaluation criteria relate directly to requirements in Section 121 of CERCLA, 42 U.S.C. § 9621. Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between alternatives. Acceptance by the State and Community are modifying criteria formally considered after public comment is received on the Proposed Plan. A discussion of each criterion relative to both remedies is presented below.

Overall Protection of Human Health and the Environment

The modified remedy is expected to provide protection of both human health and the environment by the in-situ destruction of VOCs in groundwater via enhanced bioremediation and the degradation component of natural attenuation. The biological degradation processes will permanently remove dissolved-phase VOCs from the groundwater, and the additional natural attenuation mechanisms will reduce the potential for the migration of impacted groundwater.

The installation of the treatment system at PW7 in conjunction with monitoring and responding as necessary to other residential wells with elevated VOCs insures protection of human health and the environment. Maintaining Lord's on-going health and safety program and the groundwater-use restrictions associated with the Borough Ordinance are also important aspects of the modified remedy which provides overall protection to human health and the environment.

The extraction and treatment of groundwater and air sparging with vacuum extraction were also determined to be protective of human health and the environment in the original 1993 ROD. However, the collection of additional hydrogeological data after the 1993 ROD revealed layers of low permeability material (silt and clay) which may limit the effectiveness of the two components. Given the difficulties presented by the low permeable layers in areas requiring remediation, it was projected that the effectiveness of the original remedy would be somewhat impacted.

The modified remedy is anticipated to be more effective even though it will be implemented in the same complex hydrogeology. Introducing the molasses-based carbon source into the subsurface to achieve enhanced reductive dechlorination has been demonstrated to be effective during the Pilot Study. Removing the contamination from the subsurface utilizing groundwater extraction wells and air sparging with vacuum extraction would be a more complicated and difficult task.

As a result of the presence of the low permeable layers, the modified remedy is anticipated to provide greater overall protection of human health and the environment when compared to the original remedy.

Compliance with Applicable or Relevant and Appropriate Requirements

Two categories of remedial action requirements are identified in the National Oil and Hazardous Substances Contingency Plan: Applicable or Relevant and Appropriate Requirements ("ARARs"), and other criteria, advisories, guidance and proposed standards To-Be-Considered ("TBCs"). ARARs were designated by the EPA to be Federal, state, or local laws or regulations that are protective of human health and the environment. ARARs are determined for a site, in part, by the specific contaminants present and the exposure pathways and receptors relevant for the specific remedial action. TBC materials are advisories or guidance issued by the Federal or state government (e.g., reference doses) that are not generally enforceable and do not have the status of potential ARARs. However, the guidance documents or advisories may be considered in determining the necessary level of cleanup for protection of human health and the environment when specific ARARs are not available.

Both the original remedy in the 1993 ROD and the modified remedy comply with all state and Federal ARARs, although the original 1993 ROD does identify a concern regarding whether background levels are attainable and includes a technical impracticability provision if asymptotic conditions prevail within the plume.

An evaluation of ARARs for the modified remedy was completed in the 1999 Focused Feasibility Study ("FFS"). The FFS identified ARARs and TBCs based on EPA and Commonwealth of Pennsylvania regulations and guidance documents which have been issued since the completion of the FS in 1992 and issuance of the ROD in 1993, and action-specific ARARs associated with the enhanced bioremediation technology. These include the following:

- The SDWA MCLs, 40 C.F.R. Section § 141.61, are selected as the Performance Standards for the site-related contaminants of concern ("COCs"). The following table lists each COC, the specific citation in the SDWA regulations for each COC, and the Performance Standard for each COC.

Contaminant of Concern	SDWA Citation	Performance Standard
Vinyl Chloride	40 CFR § 141.61 (a) (1)	0.002 mg/L
Trichloroethene	40 CFR § 141.61 (a) (5)	0.005 mg/L
Tetrachloroethene	40 CFR § 141.61 (a) (15)	0.005 mg/L
Trans-1,2-Dichloroethene	40 CFR § 141.61 (a) (17)	0.1 mg/L

Preliminary Remediation Goals were established for the following Contaminants of Concern at levels below the SDWA MCLs:

Contaminant of Concern	SDWA MCL	Performance Standard
1,1-Dichloroethene	0.007 mg/L	0.003 mg/L
cis-1,2-Dichloroethene	0.07 mg/L	0.05 mg/L
Ethylbenzene	0.7 mg/L	0.1 mg/L
Toluene	1.0 mg/L	0.1 mg/L

A Performance Standard was also established for 2-Chlorotoluene at 0.2 mg/L to insure a Hazard Index of less than 1. Neither Federal nor State cleanup criteria (i.e., SDWA MCL or PADEP Media-Specific Concentrations) have been established for this contaminant of concern.

- PADEP has identified Act II as an ARAR for this remedy; EPA has determined that Act II does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the Federal standard.
- The regulatory framework governing subsurface fluid distribution systems is established by the U.S. EPA Underground Injection Control ("UIC") Program. The regulations for the EPA UIC Program are set forth in 40 C.F.R. Part 144, Subpart C of the SDWA. The UIC regulations define and establish five classes of introduction wells. Generally, Class V wells are shallow discharge or disposal wells, stormwater or agricultural drainage systems, or other devices that are used to release fluids into or above an underground source of drinking water. In Pennsylvania, EPA Region III has primacy in matters involving UIC and the PADEP defers to EPA in implementing the UIC program. The following specific requirements apply to the carbon source introduction points:
 - 40 CFR, Part 144, § 144.26 (a) (1 -5);
 - 40 CFR, Part 144, § 144.26 (b) (1) (iii) (G);
 - 40 CFR, Part 144, § 144.26 (b) (2) (ii - x);
 - 40 CFR, Part 144, § 144.27 (entire section);
 - 40 CFR, Part 144, § 144.82 (entire section); and
 - 40 CFR, Part 144, § 144.84 (entire section)
- The U.S. EPA Office of Solid Waste and Emergency Response ("OSWER") Guidance for Evaluating the Technical Impracticability of Groundwater Restoration (Directive 9234.2-25, September 1993) and the U.S. EPA OSWER directive on Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Site (Directive 9200.4-17, dated November 1997) should be considered when evaluating remedial alternatives at the Site.

Long-Term Effectiveness and Permanence

Both the original remedy and the modified remedy provide long-term protection by remediating contaminated groundwater and monitoring the effectiveness of each approach. The extraction and treatment of groundwater and air sparging with vacuum extraction selected in the original ROD would remove and treat VOCs, although the additional hydrogeologic data indicated that low permeable layers could decrease the effectiveness of the system.

The enhanced bioremediation and monitored natural attenuation components of the modified remedy include the use of natural degradation processes that will continue to degrade subsurface contaminants as long as sufficient nutrients and carbon sources are available. The addition of the carbon source in the enhanced bioremediation component serves to increase the rate of these degradation processes and should reduce the mass of VOCs in a relatively short time frame. After this mass removal is achieved and the more highly chlorinated VOCs are degraded, the natural attenuation component should prove effective at addressing residual VOC concentrations.

Long-term monitoring of groundwater, including residential wells, and maintenance of the residential well treatment system at PW7 will ensure long-term protection of human health. The Borough Ordinance that prohibits the use of groundwater will protect against exposures to residual groundwater impacts, and the implementation of the health and safety plan will protect Site construction workers from unacceptable exposures.

The modified remedy is preferable when compared to the original 1993 ROD with respect to long-term effectiveness.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Enhanced bioremediation and the degradation component of natural attenuation will permanently and significantly reduce the toxicity, mobility, and volume of the VOCs at the Site through the use of natural degradation processes that transform the compounds to innocuous end products. The use of an individual treatment unit at the impacted private well west of French Creek would reduce the mobility of the VOCs but not the toxicity and volume. Dissolved-phase VOCs extracted from the subsurface would be transferred to vapor-phase within the aerator or to the adsorbed-phase within the granular activated carbon unit.

The extraction and treatment of groundwater and air sparging with vacuum extraction selected in the original ROD would also permanently and significantly reduce the toxicity, mobility, and volume of the VOCs at the Site. However, the collection of additional hydrogeological data suggests the ability to achieve the same degree of reduction is unlikely. Therefore, the modified remedy is preferable to the original remedy in regard to this criteria.

Short-Term Effectiveness

The installation of the carbon source introduction points will result in the accumulation of soils that will be managed through off-Site disposal. Soil cuttings generated during the installation of the introduction points, as well as groundwater extracted during the development of the introduction points, would be appropriately containerized and properly disposed. Routine field screening of exposed soils and ambient air would be conducted during the well installation activities to ensure protection of the community and Site workers against inhalation exposures. In accordance with the National Institute of Occupational Safety and Health ("NIOSH") and Occupational Safety and Health Administration ("OSHA") guidelines, all workers associated with the on-Site remedial system installation would wear appropriate personal protective equipment. Similar actions would be required to implement the original remedy.

The alternative remedy consists of actively enhancing the biological processes to degrade the VOCs to innocuous end products on Site, with monitoring the on-going natural attenuation (non-enhanced VOC attenuation including biological degradation) and maintaining the existing PW7 treatment system. The PW7 treatment system has effectively operated since May 1997 and the enhanced bioremediation component was demonstrated during the Pilot Study. Implementation of both components did not identify any potential adverse environmental impacts or increased exposure risks to the community.

The original 1993 ROD required the installation of groundwater extraction wells and air sparging introduction wells which would also result in the accumulation of soils that would be managed through off-Site disposal. Soil cuttings generated during the installation of the wells, as well as groundwater extracted during the development of the wells, would be appropriately containerized and properly disposed. Routine field screening of exposed soils and ambient air would be conducted during the well installation activities to ensure protection

of the community and Site workers against inhalation exposures. In accordance with the National Institute of Occupational Safety and Health ("NIOSH") and Occupational Safety and Health Administration ("OSHA") guidelines, all workers associated with the on-Site remedial system installation would wear appropriate personal protective equipment. Similar actions would be required to implement the original remedy.

Neither the original ROD or the alternative remedy have identified any short-term concerns that could not be properly managed during the implementation of the remedy.

Implementability

Implementation of enhanced bioremediation requires the use of below-grade introduction points, a readily degradable carbon source, transfer pumps, and tubing. Thus, the necessary materials are expected to be readily available. The components of the private well treatment system are currently in place and operational. Implementation of monitored natural attenuation does not require the use of ex-situ components other than readily available groundwater-quality monitoring equipment. Routine monitoring of the on- and off-Site conditions and private well post-treatment water would be conducted to detect potential problems or system failures.

Because a monitor well network is already in place within the Study Area, the enhanced bioremediation technology was successfully implemented during the Pilot Study and the private well treatment system has been successfully used since May 1997, installation and implementation of these components are expected to be technically and administratively feasible. Similarly, the implementation of monitored natural attenuation at off-Site properties would be technically and administratively feasible.

Although previously evaluated to be readily implementable, the original remedy will be more difficult to implement because of the complex geology in the areas requiring remediation. The Pre-RD Investigation determined that the lithology beneath the areas with the highest VOC concentrations were heterogeneous, with interbedded layers of silt and clay. It also determined that the extent of residual VOCs were significantly less than previously estimated. Pilot testing the air sparging/vapor extraction technology at the Sump Area identified soils with low permeability which reduced the effectiveness of the system to capture VOCs. In addition, pump testing revealed a semi-confined aquifer with layers of lower permeability material that would retard the movement of VOCs, suggesting that extraction and treatment would be less effective than predicted in the FS.

In regard to implementability, the modified remedy is preferable compared to the original remedy.

Cost

Assuming a 5-percent rate of return, the probable capital and operation, maintenance and monitoring costs (present worth) to implement the modified remedy for 20 years is as follows:

	<u>Capital</u>	<u>O&M</u>	<u># of Years</u>	<u>Total</u>
Enhanced Bioremediation	\$115,000	\$74,100	5	\$435,800
Monitored Natural Attenuation/ PW-7 Treatment System	<u>\$0</u>	<u>\$82,700</u>	<u>20</u>	<u>\$1,030,600</u>
Total Present Worth				\$1,466,400

The original 1993 ROD estimated the present worth cost of the selected remedy to be \$3,400,000 and projected that it would be implemented in ten years. Given the complex geology discussed above, it is reasonable to assume that the remedy would take twenty years to implement thereby increasing the cost to operate and maintain the remedy. The cost estimate was also revised to reflect the need for additional groundwater extraction wells and air sparging/vapor extraction wells and related necessary modifications. The original remedy was also adjusted for inflation for purposes of comparison to the modified remedy. The adjusted present net worth of the original remedy is \$8,640,396 (\$4,609,396 for capital costs and \$4,031,000 for operation and maintenance).

The modified remedy is preferable to the original remedy when comparing the remedies based on their estimated costs. The revised remedy, which is estimated to cost \$1,466,400 is a more cost-effective approach to remediate the Site and will provide an estimated cost-savings of \$7,183,996.

Community Acceptance

A thirty day public comment period began on August 27, 2002 with a notice published in Meadville Tribune, and ended on September 25, 2002. A public meeting was held on September 19, 2002 at the Saegertown Borough Building located at 603 Erie Street in Saegertown. The meeting was attended by several local citizens, several local officials, and representatives from PADEP and the Lord Corporation. No objections to the ROD Amendment were raised during the meeting, nor were any written comments from the community submitted to EPA. A summary of the questions and comments discussed during the public meeting is included in the attached Responsiveness Summary.

State Acceptance

Numerous discussions have been held with the Commonwealth of Pennsylvania regarding the implementation of the ROD and the modifications discussed in this Amendment. PADEP provided comments on the Proposed Plan which have been addressed in this ROD Amendment. The Commonwealth of Pennsylvania has concurred with this Amendment.

VI. SUPPORT AGENCY COMMENTS

All of the above changes to the remedy have been coordinated with representatives of PADEP pursuant to 40 C.F.R. § 300.435(c)(2)(ii).

VII. AFFIRMATION OF THE STATUTORY DETERMINATIONS

EPA has determined that the revised remedy complies with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621. Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA believes that the remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this Remedial Action as described in this ROD Amendment No. 1, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.

VIII. PUBLIC PARTICIPATION

A thirty day public comment period began on August 27, 2002 and ended on September 25, 2002. A public meeting was held on September 19, 2002 at the Saegertown Borough Building located at 603 Erie Street in

Saegertown. The Administrative Record includes the ROD, ESDs, and all documents that formed the basis for EPA's selection of the remedy. The Administrative Record is available for public review at the locations listed below:

U.S. EPA Region III

Saegertown Area Library

1650 Arch Street

325 Broad Street

Philadelphia, PA 19103-2029

Saegertown, PA 16433

Hours: Mon. - Fri., 9:00 a.m. - 4:00 p.m.

(814) 763-5203

The notice of availability of these documents was published in the Meadville Tribune.

9/30/02

Date



Abraham Ferdas, Director
Hazardous Sites Cleanup Division
U.S. EPA Region III

RESPONSIVENESS SUMMARY
SAEGERTOWN INDUSTRIAL AREA SITE
LORD OPERABLE UNIT
SAEGERTOWN, PENNSYLVANIA

A thirty day public comment period began on August 27, 2002 with a notice published in the Meadville Tribune. The public comment period ended on September 25, 2002. No written comments were submitted from the public to EPA throughout this period. In an effort to fully inform the community of EPA's proposed change to the remedy, EPA's Community Information Coordinator spent several days going door-to-door to both residences and businesses located near the Site to distribute Fact Sheets and answer questions. In addition, the Remedial Project Manager met individually with the residents living on the west side of French Creek that have the greatest potential for being impacted by the Site. The Remedial Project Manager discussed the proposed changes to the remedy with the residents, listened to their concerns, and answered their questions.

A public meeting was held on September 19, 2002 at the Saegertown Borough Building located at 603 Erie Street in Saegertown to discuss the Proposed Plan and the reasons for proposing the changes to the remedy. The meeting was attended by several local citizens, several local officials, and representatives from PADEP and the Lord Corporation. No objections to the ROD Amendment were raised during the meeting. The following is a summary of the two questions asked during the meeting and EPA's response.

1. A citizen asked at what depths contaminants were discovered at the Site. Specifically, the citizen asked if contaminants were detected at greater depths as contamination migrated from the Lord facility.

EPA responded that contamination was found in the shallow portion of the local aquifer at the Lord property and at greater depths as contamination migrated from the Lord property toward French Creek.

2. A citizen asked what type of long-term monitoring program would be implemented at the Site after the proposed ground water cleanup option has been executed.

EPA responded that ground water, residential wells, seeps, and possibly surface water would be monitored throughout the cleanup. Monitoring would continue even after the treatment activities are completed. Typically, quarterly monitoring occurs for a period of three years after the cleanup reaches all of the specified goals.

Following the question and answer session of the public meeting, all attendees were provided an opportunity to make a statement to be included in the official record of the meeting. The following is a summary of the statement provided by one citizen. No other attendees provided statements during this period.

A citizen indicated that he was basically satisfied with the response of Lord and EPA to the contaminants emanating from the Lord property. The citizen indicated that a cost-savings for Lord in changing the ground water remedy was a benefit for the community provided that the remedy successfully cleaned up the ground water to acceptable levels.

[end]