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Environmental Protection
Agency

Office of
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EPA/ROD/R02-91/162
September 1991

EPA

Superfund Record of Decision:

NL Industries, NJ

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-91/162	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
NL Industries, NJ
First Remedial Action

5. Report Date
09/27/91

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7. Author(s)

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401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 44-acre NL Industries site is an inactive, secondary lead smelting facility in Pedricktown, Salem County, New Jersey. Land use in the area is predominantly residential and industrial. The site is bordered by two tributaries to the Delaware River, which receive surface discharges from the site. The site overlies the Cape May aquifer, a potential source of drinking water for local residents. From 1972 to 1984, the site was used to recycle lead from spent automotive batteries, and the unused portions of the batteries were buried in an onsite landfill. During operations, batteries and other materials containing lead were stored on paved and non-paved areas onsite; and drums and debris were scattered throughout the site, within and outside of buildings, and on the paved areas. There also are approximately 1,000,000 gallons of contaminated standing water and 200 cubic yards of associated sediment at the site. Between 1973 and 1980, the State cited the potentially responsible party for multiple violations of State air and water regulations. In 1989, EPA began a multi-phased removal action, which included consolidating and encapsulating debris and lead-bearing materials into separate piles totaling 9,800 cubic yards of kiln slag and 200 cubic yards of lead oxide; removing

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - NL Industries, NJ
First Remedial Action
Contaminated Media: sediment, debris, sw
Key Contaminant: metals (arsenic, chromium, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 140
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Abstract (Continued)

over 40,000 pounds of toxic and reactive materials; incinerating 2,200 empty drums offsite; and constructing a chain-link fence to enclose the site. In addition, EPA conducted a Focused Feasibility Study (FFS) to address the remediation of slag and lead oxide piles, debris and contaminated building surfaces, standing water, and sediment. The FFS resulted in the issuance of this Early Remedial Action Record of Decision (ROD), designated as Operable Unit (OU2). The nature and extent of remaining contamination on the site and areas adjacent to the site in various environmental media, such as soil, sediment, ground water, surface water, and air, are currently being evaluated and will be addressed as OU1 in a subsequent ROD. The primary contaminants of concern affecting the slag and lead oxide piles, sediment, debris, and standing surface water are metals including arsenic, chromium, and lead.

The selected remedial action for this site includes treating onsite the slag and lead oxide piles using solidification/stabilization and placing the residual material onsite; decontaminating debris and contaminated building surfaces, with offsite treatment and disposal of debris that cannot be decontaminated; treating and disposing of standing water, wash water from the decontamination process, and sediment offsite; conducting environmental monitoring; and implementing institutional controls including land use restrictions. The estimated present worth cost for this remedial action is $4,987,000, which includes an annual O&M cost of $17,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedy will attain all Federal and State ARARs. Chemical-specific clean-up goals were not provided.

ROD FACT SHEET

SITE

Name:	NL Industries, Inc.
Location/State:	Pedricktown, Salem County, New Jersey
EPA Region:	II
HRS Score (date):	52.96 (March 1991)
NPL Rank (date):	145 (March 1991)

ROD

Date Signed: September 27, 1991

Selected Remedy

The selected remedy for the second operable unit includes the following components:

- o Solidification/stabilization and on-site placement of the slag and lead oxide piles;

Capital Cost:	$2,014,000
Annual O&M Costs:	$17,000
Present Worth Cost:	$2,303,100

- o Decontamination and off-site treatment and disposal of debris and contaminated surfaces;

Capital Cost:	$1,691,100
Annual O&M Costs:	$0
Present Worth Cost:	$1,691,100

- o Off-site treatment and disposal of standing water and sediments; and

Capital Cost:	$993,200
Annual O&M Costs:	$0
Present Worth Cost:	$993,200

- o Appropriate environmental monitoring to ensure the effectiveness of the remedy.

TOTAL

Capital Cost:	$	4,698,300
O & M:	$	17,000
Present Worth:	$	4,987,000

LEAD

Enforcement, EPA

EPA Project Manager (phone): Michael H. Gilbert (212-264-6418)

NJDEPE Case Manager (phone): Paul Harvey (609-633-1455)

WASTE

Type:	Metals contamination, particularly lead
Media:	Soil, wetlands, groundwater, surface water, standing water, sediments, and dust covered surfaces.
Origin:	Pollution originated as a result of secondary smelting of lead bearing materials and poor management and handling of these materials.

DECLARATION STATEMENT

RECORD OF DECISION

NL INDUSTRIES, INC.

SITE NAME AND LOCATION

NL Industries, Inc.
Pedricktown, Salem County, New Jersey

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the NL Industries, Inc. site, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision document summarizes the factual and legal bases for selecting the remedy for the site. The attached index identifies the items that comprise the administrative record for the site, upon which this decision is based.

The New Jersey Department of Environmental Protection and Energy concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedial alternative described in this document represents the second operable unit for the NL Industries, Inc. site. It will address slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments. A comprehensive study is underway to determine the full nature and extent of contamination on the site and areas adjacent to the site in various environmental media such as air, soils, groundwater, surface water and stream sediments. Remedial actions to address these other contaminant sources will be the subject of a subsequent Record of Decision for the site.

The selected remedy for the second operable unit includes the following components:

- o Solidification/stabilization and on-site placement of the slag and lead oxide piles;
- o Decontamination and off-site treatment and disposal of debris and contaminated surfaces;
- o Off-site treatment and disposal of standing water and sediments; and
- o Appropriate environmental monitoring to ensure the effectiveness of the remedy.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective.

This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable, and it satisfies the statutory preference for remedies that employ treatment that reduce toxicity, mobility, or volume as their principal element. The remedy, when completed, will achieve the applicable or relevant and appropriate requirements for the site.

Because the selected remedy will not allow for unrestricted use of the site and, further, will result in hazardous substances remaining on the site, a review will be conducted within five years after commencement of the remedial action to ensure that it will continue to provide adequate protection of human health and the environment.

Constantine Sidamon-Eristoff
Regional Administrator

9/27/91
Date

State of New Jersey
Department of Environmental Protection and Energy
Office of the Commissioner
CN 402
Trenton, NJ 08625-0402
Tel. # 609-292-2885
Fax. # 609-984-3962

Scott A. Weiner
Commissioner

October 2, 1991

Mr. Constantine Sidamon-Eristoff
Regional Administrator
USEPA Region II
26 Federal Plaza
New York, NY 10278

Dear Mr. Sidamon-Eristoff:

Re: Record of Decision, N.L. Industries, Pedricktown
Salem County, New Jersey

This is to formally notify the United States Environmental Protection Agency that the New Jersey Department of Environmental Protection and Energy has evaluated the selected plan for the interim remedial action at the N.L. Industries Superfund Site and concurs with the remedy as stated in the final Record of Decision.

This Record of Decision is for the contaminated slag piles, building surfaces and debris, and standing surface water. It is understood that a site-wide RI/FS is being conducted to deal with all contamination related to the site.

The components of the Record of Decision include:

* Solidification/Stabilization of the slag and on-site disposal;
* Decontamination and off-site disposal for surfaces and debris;
* Off-site treatment and disposal for the standing water.

New Jersey fully appreciates the importance of the Record of Decision in the cleanup process and will continue to take all reasonable steps to ensure that the State's commitments in this area are met.

Sincerely,

Scott A. Weiner
Commissioner

SAW:PH/kj

DECISION SUMMARY

NL INDUSTRIES, INC. SITE
PEDRICKTOWN, SALEM COUNTY, NEW JERSEY

SITE NAME, LOCATION AND DESCRIPTION

The NL Industries, Inc. (NL) site is an abandoned, secondary lead smelting facility situated on 44 acres of land on Penns Grove-Pedricktown Road, in Pedricktown, Salem County, New Jersey. The site is bisected by a railroad and includes a closed 5.6-acre landfill. The southern 28 acres contain the industrial area and landfill access road (Figure 1). NL maintains the landfill area and operates the landfill's leachate collection system.

The site overlies the Cape May aquifer. The West and East Streams, which are intermittent tributaries to the Delaware River, border and receive surface discharges from the site. The nearest home is less than 1000 feet from the site and B.F. Goodrich and the Tomah Division of Exxon, inactive facilities, are neighboring industrial facilities.

Demography and Land Use

The 1980 U.S. Census reported the total population of Oldmans Township, in which Pedricktown is located, at 1,847.

The site is part of an area that is zoned for development as an industrial park. This area includes operations of the following major corporations: Airco (inactive facility); B.F. Goodrich (inactive facility); Browning-Ferris Industries (inactive facility); and Exxon, Tomah Division (inactive facility). To the north of the industrial area, between the site and the Delaware River, is a military base and an Army Corps of Engineers Dredge Spoil area. The industrial park area is bordered by a combination of open, residential and agricultural lands. The residences are one- or two-story, single- family homes. Agricultural lands produce a variety of crops, including tomatoes, corn, soybean and asparagus.

Hydrogeologic Characteristics

The local aquifer system can be separated into three aquifers (unconfined, first confined and second confined) on the basis of groundwater elevations and lithology around the site. The site geology consists of thick and interfingering strata of clay and sand. The clay members function as aquitards in some sections. The discontinuity of the Upper Clay member provides the potential for the unconfined aquifer to leak into the first confined aquifer. The observed thickness of the Middle Clay Member appears to be greater than 20 feet, and its reported presence on adjacent industrial properties suggests that this aquitard extends across the site.

Groundwater flow in the unconfined aquifer is predominantly in a northwest direction, however, discontinuous layers of sands and clays cause localized variations in flow direction. Groundwater in the first confined aquifer appears to flow in a westerly direction. Groundwater flow in the second confined aquifer appears to be in a easterly direction. This suggests that the industrial supply wells neighboring the site may be controlling the second confined groundwater flow under the site.

Climate

The climate of the site is largely continental, chiefly as a result of the predominance of winds from the interior of North America. Climatologic data for Salem County are collected by the New Jersey Department of Agriculture. The 1987 Annual Report states that Salem County receives an average of 42.81 inches of rainfall per year. The region experiences an average temperature of 55.2° F, with a monthly average low of 33° F occurring in January and a monthly average high of 77° F occurring in July. The wind rose for Philadelphia, PA airport indicates that more than 50 percent of the wind over three miles/hour is from the west (north northwest to south southwest).

Soil

The soils under the NL site are characterized by a thin (1 to 2 inches) layer of top soil containing little plant material over a tannish-brown sandy soil. In adjacent wooded areas, a thick humus layer is overlaying the soil. This humus layer is generally six to eight inches thick. The soil under the humus layer is tannish to reddish brown. Soils on adjacent agricultural lands have twelve to fourteen inches of rich, blackish-brown topsoil with an underlying tannish-brown, sandy soil.

Drainage and Surface Water

An unnamed tributary to the Delaware River is located along the western property boundary, henceforth referred to as the West Stream in this document. A second stream, referred to as the East Stream, runs approximately 1000 feet east of and parallel to the site's eastern property boundary. Both streams merge north of Route 130 and ultimately discharge to the Delaware River, which is approximately 1.5 miles from the site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

In 1972, the facility began the operation of recycling lead from spent automotive batteries. The batteries were drained of sulfuric acid, crushed, and then put through the lead recovery process at the on-site smelting facility. Plastic and rubber waste materials were buried in an on-site landfill.

Between 1973 and 1980, the New Jersey Department of Environmental Protection (NJDEP) cited NL with 46 violations of State air regulations and issued several notices and memoranda with respect to unregulated discharges of contaminated water from the site. Water pollution violations were directed toward the battery storage area, the on-site landfill, and the septic system. NJDEP conducted an air-monitoring program in 1980 that identified airborne quantities of lead, cadmium, antimony, and ferrous sulfate produced by the smelting process, at levels exceeding the facility's operating permits.

When NL operated the facility, emissions from the plant discolored or stained aluminum siding of homes and automobiles, and etched concrete. High concentrations of lead, iron, cadmium, and antimony were detected in airborne dust samples collected by NJDEP in 1980 when the plant was operational.

NL ceased smelting operations in May 1982. In October 1982, NL entered into an Administrative Consent Order (ACO) with NJDEP to conduct a remedial program to address contamination of the site soils, paved areas, surface water runoff, landfill, and groundwater. In December 1982, the site was placed on the National Priorities List (NPL).

In February 1983, the plant was sold to National Smelting of New Jersey (NSNJ) and smelting operations recommenced. NSNJ entered into an amended ACO with National Smelting and Refining Company, Inc., (NSR), NSNJ's parent company, NL and NJDEP, which clarified environmental responsibilities of NSNJ and NL. NSNJ ceased operation in January 1984, and filed for bankruptcy in March 1984. In June 1984, NL voluntarily entered the site to pump and dispose of leachate from the landfill.

In 1986, NL signed a consent order with EPA, whereby NL assumed responsibility for conducting a site-wide Remedial Investigation [illegible] Feasibility Study (RI/FS) with EPA oversight. Versions of the [illegible] Report were submitted to EPA [illegible] April and October 1990, and April 1991. EPA amended the report and approved it in July 1991.

As discussed in more detail in the following section of this document, EPA began a Removal Action at the site in March 1989 to address site conditions which presented an imminent and substantial risk or threat to public health and the environment. Due to the magnitude and complexity of the surface contamination at the site and the constraints on EPA's regional removal program budget, EPA decided to address the most imminent or threatening conditions under the Removal program, and to conduct a Focused Feasibility Study (FFS) to address the remaining components. The FFS which provides the technical information which supports this Record of Decision, identified and evaluated remedial alternatives for an Early Remedial Action which will continue the site-stabilization and remediation efforts initiated under the Removal Action.

Removal Action Activities

EPA conducted a multi-phased Removal Action at the site to address several conditions that presented serious risk to public health and the environment. EPA conducted Phase I of the Removal Action in March and April 1989, which consisted of construction of a chain-link fence to enclose the former smelting plant and spraying or encapsulation of the on-site slag piles. Encapsulation of the piles provided temporary protection from wind and rain erosion and contaminant migration.

In July and August 1989, EPA sampled private potable wells located along U.S. Route 130, just north of the site, with the closest well being approximately 1000 feet from the landfill. The samples were analyzed for pH and heavy metals contaminants and indicated that the water was within applicable drinking water standards.

As part of the RI Phase I Sampling Program, an inventory of raw and waste materials was conducted at the site. The inventory indicated that various hazardous chemicals, notably red phosphorus and metallic sodium, were stored in a locked concrete building adjacent to the plant warehouse.

In November 1989, EPA began Phase II of the Removal Action. This phase consisted of additional encapsulation of the slag piles, securing the entrances of the contaminated buildings, and removal of over 40,000 pounds of the most toxic and reactive materials. The bulk of these materials was recycled and the remainder was sent for disposal to a permitted landfill. These materials included arsenic, metallic sodium, red phosphorus and waste oil.

Chain-link fence gates were installed at all entrances of the contaminated buildings to deter trespassing. Moreover, the leaky roof of the lead oxide storage building was repaired to prevent rainwater from entering the building.

Berms composed of sand and straw were installed around the perimeters of the four slag piles to aid in containing the slag and to filter particulates in order to prevent their entry into surface runoff. In addition, the slag piles were treated with a second coating of the previously used encapsulant to help reduce further slag migration. In April 1990, the concrete retaining walls around the slag piles were reenforced to prevent collapse and release of slag to the environment.

During February and March 1991, the slag piles, lead oxide pile and surface water at the site's former smelting facility were sampled as part of the Focused Feasibility Study (FFS) effort. This additional information was to be used to help evaluate appropriate remedial measures for treatment or disposal of these contaminated media.

During March 1991, EPA performed Phase III of its removal activities at the site. During this phase, the damages to the perimeter fence were repaired and a new entrance gate was installed.

Approximately 2200 empty, rusted and deteriorated 55-gallon steel drums were removed from the site for incineration and steel recycling.

All on-site containers, stored in the open, containing materials threatening release were emptied of their contents and piled under the existing covered area at the rear of the facility. Berms of a sand/gravel mix were installed at the base of the piles. These measures were taken to reduce the discharge of these substances as leachate or particulates.

Forty-four 55-gallon open head drums containing copper wire and cable were removed from the facility and have been shipped to an EPA warehouse in Edison, New Jersey. This material and other items of value have been the main target of trespassers into the site. It was EPA's aim that this action would reduce or eliminate site break-ins, and subsequent exposure of individuals to hazardous materials.

Current Conditions

The site is presently inactive. NL maintains the landfill area and its leachate collection system. The landfill operator and the New Jersey State Police continue to monitor the site. EPA has posted signs indicating that the site is hazardous and entry to the property is restricted. Figure 2 shows the location of the remaining on-site contaminant sources and debris. Table 1, provides an estimated quantitative inventory of these materials.

Enforcement Activities

Initial enforcement investigations identified the previous and current site owners and operators as Potentially Responsible Parties (PRPs) for the site. These were NL, NSNJ, NSR and Standard Metals Corp. Under an ACO, NL is currently performing the site-wide RI/FS (referred to as the first operable unit or OU-1). EPA's records indicate that NSNJ and NSR are bankrupt, and Standard Metals Corp. reformed after bankruptcy.

EPA has recently identified additional PRPs, primarily generators, to whom General Notice Letters, along with a demand for past costs, were sent pursuant to Section 107 (a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA). These PRPs are believed to have sent hazardous substances including, but not limited to, lead to the site.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan, FFS and other information related to the second operable unit (OU-2) remedy (addressing the slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments) were released to the public on July 17, 1991. These documents were made available to the public in the Administrative Record file at the following locations:

Penns Grove Public Library
South Broad Street
Penns Grove, NJ 08069

Pedricktown Municipal Building
Box 98 Mill Street
Pedricktown, NJ 08067

U.S. Environmental Protection Agency
Emergency & Remedial Response Division
Division File Room, 29th Floor
26 Federal Plaza
New York, NY 10278

The notice of availability of these document was published in *The Gloster County Times* and *Today's Sunbeam* on July 17, 1991. A public comment period was held from July 17 to September 6, 1991. In addition, a public meeting was held on August 6, 1991. At this meeting, representatives from EPA presented and answered questions on the results of the site-wide RI, the results of the FFS for OU-2, and EPA's preferred remedy for OU-2.

Responses to all comments pertaining to remedy selection which were received by EPA in writing during the public comments period are included in the Responsiveness Summary, which is an attachment to this document. The Responsiveness Summary also includes EPA's responses to questions and concerns regarding remedy selection which were stated during the August 6 public meeting.

SCOPE AND ROLE OF OPERABLE UNIT WITHIN SITE STRATEGY

Due to the size and complexity of the site, EPA is addressing its remediation in phases, or operable units. This Record of Decision addresses the remediation of several areas of hazardous surface contamination which EPA has designated as Operable Unit Two (OU-2). These areas, which include slag and lead oxide piles, debris and contaminated surfaces, and contaminated standing water and sediments, were found to be significant and continual sources of contaminant migration from the site.

In 1989, EPA began a Removal Action at the site which addressed conditions that presented an imminent risk and/or threat to public health and the environment. Recognizing the magnitude of activities that qualified for action under its removal authority, EPA prioritized its efforts to address the most serious and threatening conditions first. EPA conducted a FFS to address the slag and lead oxide piles, debris and contaminated surfaces, and contaminated standing water and sediments on an expedited basis that would be consistent with the long-term remedy for the site. The FFS identified and evaluated remedial alternatives for an Early Remedial Action which would continue the site-stabilization and remediation efforts which were initiated under the Removal Action activities.

The Early Remedial Action will prevent further releases of contaminants from areas of hazardous surface contamination and can be implemented while the site-wide RI/FS proceeds.

Removal Action Activities

EPA conducted a multi-phased Removal Action at the site to address several conditions that presented a risk to public health and the environment. The Removal Action activities are described in detail under the Site History and Enforcement Activities section of this document.

Operable Unit One

A site-wide RI/FS, which EPA has designated as Operable Unit One (OU-1), is currently being performed for NL by O'Brien & Gere Engineers, Inc. This RI is a comprehensive study designed to determine the nature and extent of contamination on the site and areas adjacent to the site in various environmental media such as air, soils, groundwater, surface water and stream sediments. The FS will identify and evaluate remedial action alternatives to address contaminated media sources and eliminate potential long-term health and environmental risks.

Operable Unit Two

The basis for expediting response actions at the site is supported by the criteria for performing a Removal Action.

Section 300.415 of the National Oil and Hazardous Substances Contingency Plan (NCP) describes the following factors to be used in determining whether a Removal Action is appropriate.

[i] Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby human populations, animals, or the food chain

[ii] Actual or potential contamination of drinking water supplies or sensitive ecosystems

[iii] Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release

[iv] High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate

[v] Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released

[vi] Threat of fire or explosion

[vii] Other appropriate Federal or State response mechanisms to respond to the release are not available

[viii] Other situations or factors that may pose threats to public health or welfare or the environment

An assessment of the conditions at the NL site with respect to the criteria described in Section 300.415 of the NCP and above yield the following conclusions:

- The presence of bulked storage piles containing hazardous substances satisfies criteria (i) and (iii).
- The presence of contaminated standing water on surfaces and in basements that may migrate off site satisfies criteria (i), (ii) and (iv).
- The presence of dust contaminated surfaces and debris satisfies criteria (i) and (v).
- The presence of a lead oxide pile and slag piles satisfies criteria (i), (iv) and (v).

• The presence of lead on the paved surfaces satisfies criteria (iv) and (v).

In addition, the need for a Removal Action is a direct result of the unique circumstances associated with thefts and vandalism at the site, which satisfies criterion (viii).

The response actions taken pursuant to this Record of Decision are consistent with Section 104 of CERCLA, as amended. The Early Remedial Action will continue the site-stabilization effort begun under the Removal Action activities and will be consistent with the long-term site-wide remedial action.

SUMMARY OF SITE CHARACTERISTICS

Sources of Contamination

The NL Industries site was used during the approximate period from 1972 through 1984 for the production of lead from used batteries and other lead-bearing materials. As a result, the site contains many potential sources of chemical contamination. Numerous mechanisms for chemical migration, and many exposure pathways for both human and ecological receptors exist.

The three areas of hazardous surface contamination at the site which were identified by EPA during previous investigations and addressed within this operable unit include, the slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments.

Four separate piles contain an estimated volume of 9800 cubic yards of kiln slag from the smelting process, which are a source of heavy metal and metal oxides contamination. Approximately 200 cubic yards of lead oxide and similar materials, which are also sources of lead and dust emissions, are stored in enclosed areas.

Drums and debris were scattered throughout the site, within and outside of buildings and on the paved areas. Some of this material is lead feed stock with high lead content. As part of EPA's Removal Action activities, much of the reactive materials were removed from the site, and contaminated debris and drums of lead-bearing material, located throughout the site and buildings, were consolidated into piles in semi-protected areas of the site. Wipe samples indicated that equipment surfaces and the process building floor and walls were contaminated. Elevated levels of inorganics such as lead, cadmium and nickel were detected. Lead-bearing materials are also present on contaminated surfaces throughout the facility, specifically in piping, piles, conveyer and dust collection systems, and the process and ventilation equipment.

The buildings on the site contain many physical and environmental hazards, including water filled basements, areas filled with ponded water, hidden pits, and sumps containing contaminated liquids and sludges. Contaminated water was estimated at approximately one million gallons. Approximately 200 cubic yards of sediment were estimated to have accumulated in the standing water. Drains are blocked and contaminated liquid continues to accumulate and run off from the ponded areas.

Concentrations of contaminants of concern, which were detected during sampling of the slag and lead oxide piles, debris and contaminated surfaces and standing water, are listed in Tables 2, 3 and 4.

In addition to the numerous contamination sources described above, the contaminants are believed to have migrated into the soil, groundwater, surface waters and sediments, and air, since the plant began operation in 1972. Sampling of these media has been undertaken by NL in connection with the site-wide RI/FS and was not addressed in the FFS.

SUMMARY OF SITE RISKS / NATURE AND EXTENT OF THE PROBLEM

EPA conducted a qualitative Risk Assessment to evaluate the potential risks to human health and the environment associated with the NL site in its current state. The Risk Assessment focused on CECRLA hazardous substances in the slag and lead oxide piles, standing water and dust which are likely to pose significant risk to human health and the environment.

Toxicity Information

High concentrations of lead, cadmium, nickel and other inorganics have been detected on site in the slag, standing water and dust. Lead is considered a probable human carcinogen and exposure to lead is also associated with human noncarcinogenic effects, including alterations in the hematopoietic and nervous system. Currently, however, there are no EPA-verified toxicity values available for lead and hence, the risks associated with lead exposure cannot be quantitated in a risk assessment. EPA thus relies solely on risk management, rather than risk assessment, to base decisions on lead.

Exposure to cadmium and nickel has been associated with noncarcinogenic effects via ingestion. Cadmium is a probable human carcinogen by inhalation based on evidence from human and animal studies. Nickel dust has an A classification and is carcinogenic by inhalation.

Contamination Exposure Pathways

An exposure pathway consists of the following elements: (1) a source and mechanism of chemical release to the environment; (2) an environmental transport medium for the released chemical (e.g., air, surface runoff); (3) a point of potential human contact with the contaminated medium (referred to as an exposure point); and (4) a route of exposure at the exposure point (e.g., ingestion, inhalation or dermal contact).

The plant-area sources of contamination have previously been identified as airborne contamination and surface runoff resulting from the slag piles, other hazardous waste areas and standing water at the site. With these contaminant sources (i.e., slag piles, standing water and dust), there are many potential exposure scenarios. The following paragraphs address release mechanism, transport mechanism, potentially exposed populations and exposure routes relative to each of the potential exposure media, namely, slag and lead oxide piles, debris and contaminated surfaces, and contaminated standing water. Only the current land-use exposure pathways were evaluated.

Slag Piles and Lead Oxide Piles

Four slag piles totaling approximately 9800 cubic yards are stored on site in open deteriorating bins, and on paved ground surfaces. Consequently, the potential for the creation of dust via wind erosion is high. In addition, approximately 200 yards of lead oxide and similar materials are stored in enclosed areas. The slag materials were sprayed with an encapsulant as a temporary measure to mitigate releases of hazardous constituents and contaminant migration that would occur from wind and rain erosion.

High concentrations of metals were detected in the slag and lead oxide piles. Concentrations of lead detected were as high as 130,000 parts per million (ppm) and 480,000 ppm in the slag and lead oxide piles, respectively. These concentrations exceeded the lead cleanup range of 500 to 1000 ppm specified under OSWER Directive #9355.4-02. In addition, the Toxicity Characteristic Leachability Procedure (TCLP) results presented in Table 5 indicate that the majority of piles tested are hazardous based on leachability of lead and/or cadmium.

Based on the level of contamination detected in the slag and lead oxide piles, a qualitative risk assessment indicates that the potential for inhalation of contaminated dust is considered significant for on-site workers and nearby receptors. Runoff via rain erosion is a mechanism for potential release of contaminants into the environment. In addition, exposure to contaminants via accidental ingestion, inhalation or through dermal contact is of potential concern for site workers and trespassers on the site.

Debris and Contaminated Surfaces

The process building walls, ceiling, floors, structural members, piping, and equipment are covered with dust. The results of wipe tests taken by EPA's Technical Assistance Team (TAT) contractor in Table 2 indicate high concentrations of lead, iron, cadmium, nickel, and copper throughout the building. Concentrations of lead ranged from 0.88 to 552 micrograms/kg/quarter square meter. Approximately 2500 cubic yards of contaminated debris consisting of lead dross and contaminated wooden pallets, baghouse bags, scrap metal and other materials are present throughout the site. Much of these materials were consolidated in temporarily protected areas, as part of the most recent removal activity.

Releases of contaminants to air may occur from the migration of dust due to wind or activities at the site. The metal concentrations in the dust are significant and may pose a health risk, if inhaled by on-site workers or individuals downwind of the site. The potential also exists for site workers or trespassers and animals to be exposed to contaminated dust through dermal contact or ingestion, although the potential risk from this pathway is expected to be much lower when compared to the inhalation pathway.

Standing Water

It is suspected that the drains are blocked in areas where standing water is ponded. It was estimated that approximately one million gallons of contaminated standing water (i.e., accumulated rainwater) is present at the site. Samples of standing water collected by EPA's TAT contractor in November 1989 (Table 2) and March 1991 (Table 4), were found to have high concentrations of lead and other metals. Lead and cadmium concentrations were detected as high as 5500 parts per billion (ppb) and 560 ppb, respectively. The contamination is due, in part, to airborne particulates, and rainwater runoff from the slag and lead oxide piles and other waste materials. In addition, approximately 200 cubic yards of contaminated sediments were estimated to have accumulated in the standing water.

Given site conditions, accidental ingestion, inhalation and dermal contact are potentially the most likely on-site exposure pathways. The potential receptors would likely be site workers and area trespassers.

Off-site contaminant migration is potentially a significant exposure pathway from the NL site. During heavy rainfall, the standing water eventually overflows the site in the area of the West Stream. Concentrations of lead in the stream were measured as high as 206 ppb in surface water samples and 26,800 ppm in stream sediment samples taken in 1990. The lead concentrations in the stream exceed the EPA recommended surface water criterion of 1.3 ppb for protection of aquatic life due to chronic toxicity.

Conclusion

In summary, the Risk Assessment determined that current on- and off-site exposures to CERCLA hazardous substances, including lead, present in the slag and lead oxide piles, contaminated surfaces and debris, and standing water and sediments pose sufficient risk to human health and the environment to warrant the response actions chosen in this Record of Decision.

DESCRIPTION OF REMEDIAL ALTERNATIVES

The feasibility study process involves, as a first step, selecting technologies that are appropriate for addressing the public health and environmental concerns associated with a particular site.

In the case of the NL site, the remedial objectives focus on preventing future release and migration of hazardous materials and eliminating the areas addressed in OU-2 as sources of future contamination and exposure on and off site. The remedial measures evaluated were designed to alleviate the potential public health risks and environmental impacts associated with three areas addressed in the FFS, namely, the slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments present at the NL site.

The alternatives that are presented in this document are those that passed the initial screening as presented in the Evaluation of Alternatives section of the FFS Report. Further evaluation of these alternatives is presented in the next section.

CERCLA, as amended, requires each selected site remedy to be protective of human health and the environment, cost-effective, and in accordance with statutory requirements. Permanent solutions to hazardous waste contamination problems are to be achieved wherever possible while treating wastes on site, and applying alternative or innovative technologies are preferred.

The FFS presents remedial alternatives to address three areas of hazardous surface contamination at the site: slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments. A wide range of technologies was considered to address the remedial objectives for each of these areas. These technologies were screened on the basis of effectiveness, implementability and cost. Those that were not eliminated from consideration during screening were assembled into the remedial alternatives presented below. The term "Months to Achieve Remedial Action Objectives" refers to the amount of time it would take to design, construct and complete the action, but does not include the time that may be involved for negotiations between EPA and PRPs, for private-party funding or implementation of the work. "N/A" denotes that the "Months to Achieve Remedial Action Objectives" is not applicable for the alternative.

Slag and Lead Oxide Piles

Alternative SP-1: No Action

Capital Cost:	$0
Annual O&M Costs:	$25,000
Present Worth Cost:	$439,000

Months to Achieve Remedial Action Objectives: N/A

Superfund regulations require that a No Action alternative be evaluated at every site to establish a baseline for comparison. The No Action alternative for the slag and lead oxide piles would include annual sampling and analysis of groundwater, surface waters and soils on and around the site to monitor the migration of contaminants. In addition, assessments would be performed every five years to determine the need for further actions.

Alternative SP-3: Off-Site Flame Reactor

Capital Cost:	$4,215,100
Annual O&M Costs:	$0
Present Worth Cost:	$4,215,100

Months to Achieve Remedial Action Objectives: Eighteen

This alternative would include removing and treating the slag and lead oxide off site in a flame reactor. This innovative technology would involve subjecting the wastes to very hot gas which reacts rapidly to produce a nonhazardous slag and a recyclable metal-enriched oxide. The volume of material would be reduced 10 to 20 percent. The slag could possibly be recycled as fill material or road aggregate and the metal-enriched oxide could be recycled by a secondary smelting facility, although at this time, no markets have been identified for these materials.

Alternative SP-4: On-Site Hydro-Metallurgical Leaching/On-Site Disposal

Capital Cost:	$2,980,400
Annual O&M Costs:	$17,000
Present Worth Cost:	$3,269,500

Months to Achieve Remedial Action Objectives: Sixteen

This alternative would treat the existing waste by a hydro-metallurgical leaching process on site. Bench-scale testing would be required to define design criteria. The process, which is widely used in the metallurgical industry, selectively dissolves lead and other heavy metals present in the waste materials. The leaching step would be followed by filtration, residue collection, and precipitation. The precipitate is a lead-rich, potentially marketable product. The caustic leaching solution would be recycled through the process. The resulting treated material would require testing according to the TCLP to confirm that the material is nonhazardous. There would be no significant reduction in volume of the material. The treated material would be redeposited on site in accordance with Resource Conservation and Recovery Act (RCRA) treatment standards. For conservative cost-estimating purposes, it was assumed that on-site placement would meet RCRA Subtitle D landfill requirements. Any material from which contaminants would leach above acceptable RCRA regulatory levels, as determined by TCLP testing, would be disposed of off site at an appropriate RCRA-permitted facility. However, it is expected that all of the material would meet RCRA regulatory levels after treatment.

Alternative SP-5: On-Site Solidification/Stabilization/ On-site Disposal

Capital Cost:	$2,014,000
Annual O&M Costs:	$17,000
Present Worth Cost:	$2,303,100

Months to Achieve Remedial Action Objectives: Fifteen

This alternative would stabilize the existing waste on site by using a mobile treatment system. This technology immobilizes contaminants by binding them into an insoluble matrix. Stabilizing agents such as cement, pozzolan, silicates and/or proprietary polymers would be mixed with the feed material. The equipment is similar to that used for cement mixing and handling. Bench-scale tests would be required to select the proper quantity of stabilizing agents, feed material, and water. It is possible that contaminated standing water may be utilized in this process. Depending on the specific treatment process, the stabilized volume may increase up to 40 percent of the original volume. The stabilized material would require testing according to the TCLP to confirm that the material is nonhazardous. Disposal of the treated material would occur on site in accordance with RCRA treatment standards. For conservative cost-estimating purposes, it was assumed that on-site placement would meet RCRA Subtitle D landfill requirements. Any material from which contaminants would leach above acceptable RCRA regulatory levels, as determined by TCLP testing, would be disposed of off site at an appropriate RCRA-permitted facility. However, it is expected that all of the material would meet RCRA regulatory levels after treatment.

Debris and Contaminated Surfaces

Alternative CS-1: No Action

Capital Cost:	$17,700
Annual O&M Costs:	$6,800
Present Worth Cost:	$136,000

Months to Achieve Remedial Action Objectives: N/A

The No Action alternative for contaminated surfaces and debris provides a baseline against which other alternatives may be compared. Contaminated debris, equipment and surfaces would be left in their current condition. Roofs would be repaired where necessary and a long-term maintenance program would be implemented to ensure that the buildings are not accessible. In addition, assessments would be performed every five years to determine the need for further actions.

Alternative CS-2: Debris and Contaminated Surfaces Decontamination/Off-Site Treatment and Disposal

Capital Cost:	$1,691,100
Annual O&M Costs:	$0
Present Worth Cost:	$1,691,100

Months to Achieve Remedial Action Objectives: Twelve

This alternative would involve decontaminating the contaminated building surfaces, debris (i.e., scrap metal, pallets, etc.) and equipment using dusting, vacuuming and wiping procedures. Parts of the buildings and surfaces which could withstand high water pressure would be cleaned by hydroblasting. Materials would be recycled where possible. Debris that could not be decontaminated, such as contaminated baghouse bags, along with collected dust, would be transported to an appropriate off-site, RCRA-permitted facility. Contaminated wash water would be treated with the on-site standing water.

Standing Water and Sediments

Alternative SW-1: No Action

Capital Cost:	$0
Annual O&M:	$10,700
Present Worth Cost:	$220,100

Months to Achieve Remedial Action Objectives: N/A

The No Action alternative for standing water provides a baseline against which other alternatives may be compared. This alternative would rely on natural attenuation of contaminated standing (rain) water without any treatment. Drains would remain plugged and contaminated. Contaminated standing water would be likely to continue to overflow the site into the West Stream. This alternative would include annual monitoring of groundwater, surface waters and soils in and around the site to track contaminant migration. In addition, assessments would be performed every five years to determine the need for further actions.

Alternative SW-2: On-Site Treatment and Groundwater Recharge

Capital Cost:	$1,335,000
Annual O&M Costs:	$0
Present Worth Cost:	$1,335,000

Months to Achieve Remedial Action Objectives: Fourteen

This alternative would consist of collecting and treating approximately one million gallons of standing water on site. Wash water, which was generated from the decontamination of contaminated surfaces and debris, would also be treated with the standing water. The treatment process would consist of precipitation, clarification, filtration and, if necessary, ion exchange or ion replacement. The treated water would be recharged to the groundwater via injection wells or infiltration basins. Sediments and sludges generated during the treatment process would be treated and disposed of at an appropriate off-site, RCRA-permitted facility capable of accepting these materials. The treatment system would be designed to reduce metal concentrations to meet Federal and State discharge standards. Treatability studies would be required to define the design and operating criteria to meet the required standards for groundwater recharge. As part of this alternative, drains would be unplugged and cleaned, which in conjunction with the decontamination of buildings and paved surfaces, would prevent contaminated runoff from leaving the site in the future.

Alternative SW-3: Off-Site Treatment and Disposal

Capital Cost:	$993,200
Annual O&M Costs:	$0
Present Worth Cost:	$993,200

Months to Achieve Remedial Action Objectives: Six

This alternative would consist of collecting approximately one million gallons of standing water in approximately 200 tanker trucks and transporting it to an off-site, RCRA-permitted treatment facility, which would be capable of accepting the water with no pretreatment at the site. Wash water, which would be generated from the decontamination of contaminated surfaces and debris, would also be transported with the standing water. Sediments would be transported to an appropriate off-site, RCRA-permitted facility that would be capable of accepting this material. Samples of the contaminated water and sediments would be sent to the treatment facilities to ensure waste acceptance. As part of this alternative, drains would be unplugged and cleaned, which in conjunction with the decontamination of buildings and paved surfaces, would prevent contaminated runoff from leaving the site in the future.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, a detailed analysis of each remedial alternative was conducted with respect to each of nine evaluation criteria. This section discusses and compares the performance of the remedial alternatives under consideration against these criteria. The nine criteria are described below, and all selected alternatives must at least attain the Threshold Criteria. The selected alternative should provide the best trade-offs among the Primary Balancing Criteria. The Modifying Criteria were evaluated following the public comment period.

Threshold Criteria

- Overall Protection of Human Health and the Environment: This criterion addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.

- Compliance with ARARs: This criterion addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements (ARARs) of Federal and State environmental statutes (other than CERCLA) and/or provide grounds for invoking a waiver. There are several types of ARARs: action-specific, chemical-specific, and location-specific. Action-specific ARARs are technology or activity-specific requirements or limitations related to various activities. Chemical- or contaminant-specific ARARs are usually numerical values which establish the amount or concentration of a chemical that may be found in, or discharged to, the ambient environment. Location-specific requirements are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely because they occur in a special location. Summaries of the contaminant-specific, action-specific and location-specific ARARs are presented in Tables 6, 7, and 8, respectively. In addition, Table 9 contains numerical values for contaminant-specific ARARs relevant for groundwater and surface water discharges.

Primary Balancing Criteria

- o Long-term Effectiveness and Permanence: This criterion refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

- o Reduction of Toxicity, Mobility or Volume Through Treatment: This criterion addresses the degree to which a remedy utilizes treatment to reduce the toxicity, mobility or volume of contaminants at the site.

- o Short-term Effectiveness: This criterion refers to the time in which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

- o Implementability: Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the selected alternative.

- o Cost: Cost includes capital and operation and maintenance (O & M) costs. Cost comparisons are made on the basis of the present worth value of the entire cost of the alternative.

Modifying Criteria

- o State Acceptance: This criterion indicates whether, based on its review of the FFS, the Proposed Plan and the Record of Decision, the State concurs with, opposes, or has no comment on the preferred alternative. This criterion is satisfied since the State concurs with the preferred alternative.

- o Community Acceptance: This criterion addresses the public's general response to the alternatives described in the Proposed Plan and the FFS report. Comments received during the public comment period and EPA's responses to these comments are addressed in the Responsiveness Summary attached to this document.

The comparison of remedial alternatives using the nine evaluation criteria for each area of hazardous surface contamination is presented below.

Comparison of Slag and Lead Oxide Piles (SP) Remedial Alternatives

This subsection compares the relative performance of each slag and lead oxide remedial alternative using the specific evaluation criteria listed above. A summary of this comparative analysis is presented in Table 10.

Overall Protection of Human Health and the Environment

Alternative SP-1, the No Action alternative, does not meet the remedial objectives; thus it is not protective of human health and the environment. Surface water and groundwater and soils would be further contaminated due to migration of contaminants from slag and lead oxide piles. Alternative SP-3 would meet remedial objectives by removing the hazardous slag and lead oxide materials from the site. Alternative SP-4 would meet remedial objectives by leaching contaminants from the slag and lead oxide piles. Alternative SP-5 would meet remedial objectives by binding contamination into a insoluble matrix. Alternatives SP-4 and SP-5 would place the treated material on site in accordance with RCRA treatment standards. For conservative cost-estimating purposes, it was assumed that the on-site placement would meet RCRA Subtitle D requirements, although the actual disposal requirements would be defined during the design phase of the project, pending treatability studies. Long-term monitoring would be required for Alternatives SP-4 and SP-5.

Compliance with ARARs

Occupational Safety and Health Administration (OSHA) Standards, RCRA Land Disposal Restrictions (LDR), RCRA Subtitle D Nonhazardous Waste Management Standards and RCRA Identification of Hazardous Waste, which defines the TCLP to characterize a waste as being hazardous, are ARARS which apply to, and would be met by, Alternatives SP-3, SP-4 and SP-5. Department of Transportation (DOT) Rules for Hazardous Materials Transport and RCRA Requirements for Transporting Waste for Off-Site Disposal would apply and be met by Alternative SP-3. Alternative SP-5 would comply with 40 CFR 264, Subpart X, which provides standards that are applicable to the on-site solidification/stabilization of contaminated waste. A complete listing of ARARs for the site is contained in Tables 6, 7, 8, and 9.

Alternative SP-1 would fail to comply with all the associated contaminant-specific ARARs but would comply with the action-specific ARARs.

All removal and/or treatment technologies proposed for use in Alternatives SP-3, SP-4 and SP-5 would be designed and implemented to satisfy all contaminant-specific, location-specific and action-specific ARARs. Alternatives SP-3, SP-4 and SP-5 are designed to render treated materials nonhazardous according to the

TCLP. Some uncertainty exists for Alternative SP-4 to meet all contaminant-specific ARARs due to the presence of multiple contaminants.

Long-Term Effectiveness and Permanence

Alternative SP-1 would only monitor the migration of the contaminants and does not provide removal and/or treatment. Therefore, it is not effective for the long-term protection of human health and the environment.

Alternatives SP-3, SP-4 and SP-5 would mitigate the hazards by total removal and/or treatment and disposal of slag and lead oxide materials.

Some uncertainty exists with respect to the effectiveness and implementability of Alternative SP-4, since it has not been applied to similar CERCLA waste material. Although some long-term uncertainties regarding the integrity of the stabilized mass have been raised, Alternative SP-5 is highly effective in treating inorganic contamination and will inhibit leaching of contaminants.

Alternatives SP-4 and SP-5 would place treated materials on site in accordance with RCRA treatment standards. For cost-estimating purposes, it was assumed that the on-site placement would meet RCRA Subtitle D requirements, although the actual disposal requirements would be defined in design, pending treatability studies. Although treated material may be considered nonhazardous, it would require long-term monitoring. Alternative SP-3 would be considered a permanent remedy and would not require long-term monitoring.

Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative SP-1, the No Action alternative, would not provide any immediate reduction in toxicity, mobility and volume of contaminants. It may provide some reduction in toxicity and volume by natural attenuation, but it would be insignificant. It would not provide any long-term reduction in mobility of contaminants. Alternatives SP-3 and SP-4 would result in significant reductions in toxicity, mobility and volume of contaminants. Alternative SP-3 would reduce the toxicity, mobility and volume by removal of contaminated slag and lead oxide materials from the site and off-site treatment and disposal or recycling. Alternative SP-4 would reduce toxicity, mobility and volume by on-site treatment. Alternative SP-5 would reduce the mobility and toxicity of the contaminants in that they would be immobilized in the stabilized mass and no longer present a direct contact threat. Alternatives SP-4 and SP-5 would leave some contaminants on site, but their mobility would be significantly reduced. Alternative SP-5 would result in some volume increase after treatment.

Short-Term Effectiveness

The implementation of Alternative SP-1, the No Action alternative, should not result in any additional risk to the workers and the community. Alternatives SP-3, SP-4 and SP-5 include activities such as contaminated slag and lead oxide removal, handling, treatment and/or transportation that could result in potential exposure of workers and residents to contaminated dust generated from remedial activities. Alternatives SP-4 and SP-5 involve on-site treatment that reduces the chances of spillage of hazardous waste in transit, but could result in worker exposure to contaminants during treatment. However, Alternative SP-5 employs a less complex treatment process than Alternative SP-4, and does not involve the handling of such hazardous chemicals. Dust control measures and closed loop treatment systems would significantly reduce these possibilities. For costing purposes, it was assumed that it would take a period of 30 years for natural attenuation to achieve protection under Alternative SP-1. Implementation periods of 18, 16 and 15 months were estimated for Alternatives SP-3, SP-4 and SP-5, respectively. These estimates include design and testing, selection of a contractor, mobilization, demobilization, and actual remediation period.

Implementability

Alternative SP-1 does not involve any major site activities except monitoring, which can be easily implemented. Alternatives SP-3, SP-4 and SP-5 involve removal and/or treatment of contaminated slag and lead oxide materials from the site. Implementability of Alternative SP-3, which involves a flame reactor, is considered an innovative technology and implementability on a commercial scale has not been proven, nor has it been used at any Superfund site. Markets have not been identified for the process byproducts associated with this alternative, which may further increase costs. Regulatory permits must be approved and obtained and implementation depends on the availability of an operating flame reactor facility at the time of remediation. Alternative SP-4 could be implemented because the technology is available and proven in the hydro-metallurgical industry. However, the process has not been used for similar applications or waste materials. It may also require a series of steps to leach multiple contaminants and would also produce a slag and lead oxide residue which would require disposal, in addition to large amounts of liquid wastes generated during the process.

Solidification/stabilization would be relatively simple to implement, since a one-step mixing and placement process is used. This alternative would treat these wastes to be nonhazardous, which would be ensured by testing according to the TCLP. The technology is proven for CERCLA waste contaminated with metals. Mobile treatment units are also available. Any material from which contaminants would leach above acceptable RCRA regulatory levels, as determined by TCLP testing, would be disposed of off site at an appropriate RCRA-permitted facility. However, it is expected that all of the material would meet RCRA regulatory levels after treatment.

Cost

The total capital, annual operation and maintenance, and present worth costs for all slag and lead oxide material alternatives are presented in Table 10. The present worth cost, based on a discount rate of five percent and a 30-year operation period, for Alternatives SP-1, SP-3, SP-4 and SP-5 are $439,000, $4,215,100, $3,269,000 and $2,303,100, respectively. Alternatives SP-1, SP-4 and SP-5 would require annual operation and maintenance costs. Alternative SP-3 does not require long-term operation and maintenance. Alternative SP-1 is the least expensive alternative. However, its primary constituent is monitoring and does not involve any treatment and disposal. Alternative SP-5 is the least expensive treatment and disposal alternative while alternative SP-3 is the most expensive.

Comparison of Debris and Contaminated Surfaces (CS) Alternatives

This subsection compares the relative performance of each debris and contaminated surfaces remedial alternative using the specific evaluation criteria listed previously. A summary of this comparative analysis is presented in Table 11.

Overall Protection of Human Health and the Environment

Alternative CS-1, the No Action alternative, would leave debris and surfaces, which are primarily contaminated with lead dust, in their current condition. This alternative would not meet the remedial objectives and would not allow safe entry in the future. Human health would be protected from direct exposure as long as the site and building security can be effectively maintained. However, risk due to exposure of down-wind receptors and environmental risks would not change. In comparison, Alternative CS-2 would decontaminate debris and remove it from site for disposal in a Subtitle D landfill. This alternative would also recycle any appropriate materials. Alternative CS-2 would also remove contaminated dust from the buildings and equipment surfaces. Therefore, it would be fully protective of human health and the environment. In addition, Alternative CS-2 achieves the remedial objectives and allows safe entry into the buildings.

Compliance with ARARs

Alternative CS-1 would not achieve contaminant-specific ARARs. However, it would comply with action-specific and location-specific

ARARs. ARARS which apply to, and would be met by Alternative CS-2 are OSHA Standards, DOT Rules for Hazardous Materials Transport, and RCRA Requirements for Transporting Waste for Off-site Disposal. A complete listing of ARARs for the site is contained in Tables 6, 7, 8 and 9.

Long-Term Effectiveness and Permanence

Alternative CS-1 would only maintain the site and buildings in their present conditions. Therefore, debris and contaminated dust on surfaces would remain, although roof repairs would prevent water leakage and transport of contaminants. Protection of human health and the environment would rely solely on maintaining the site and building security. Alternative CS-2 would remove all hazardous debris and dust for off-site treatment and disposal. Materials would be recycled wherever possible. Any contaminated water generated from decontamination operations would be removed and treated and/or disposed of with the standing water. This alternative would eliminate long-term exposure risks from the site and the buildings to on-site workers and downwind receptors. The buildings could be safely entered after decontamination without presenting a risk to human health.

Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative CS-1 would not provide any reduction in toxicity or volume. Mobility of contaminants in the buildings would be somewhat reduced by repairing the leaky roof. However, mobility of contaminants from debris staged outdoors would remain unaltered. Alternative CS-2 would provide complete reduction in mobility, toxicity and volume, since all contaminants would be removed from the site.

Short-Term Effectiveness

Alternative CS-1 would not result in any additional risk to the workers, community or the environment as long as building security and integrity could be maintained. Roof repair would not introduce additional risk. Alternative CS-2 would involve removal and transport of contaminants from the site. Therefore, there would be some potential public exposure risks as well as environmental impacts associated with possible accidents involving transportation of waste materials to approved facilities. Worker exposure risk would increase during decontamination activities associated with Alternative CS-2. These risks would be mitigated by protective equipment and strict adherence to the site-specific Health and Safety Plan. Alternative CS-1 would require long-term maintenance. Alternative CS-2 would be considered a permanent remedy and would not require any maintenance. Roof repair for Alternative CS-1 could take approximately one month. Building decontamination could be accomplished in approximately three months for Alternative CS-2. However, a period of one year was estimated for design, bidding, selection of a contractor, mobilization, demobilization, and actual decontamination time.

Implementability

Alternative CS-1 could be easily implemented as it does not involve any major activities. This alternative would require monitoring, roof repair, and maintaining site security. Alternative CS-2 would require extensive decontamination. Multiple technologies such as dusting, vacuuming, wiping and hydroblasting would be utilized depending on the area of the building and surfaces to be decontaminated. Some parts of the buildings, such as walkways and stairs, are structurally weak and would require proper assessment before using high pressure washing techniques such as hydroblasting. Although some of the areas, such as the kiln burner building, feed building and decasing building, have walls and roofs containing asbestos, it is not in a friable state. Friable asbestos was removed during the Removal Action activities, and proper care would be taken during the buildings' decontamination to ensure that friable asbestos would not be exposed during these activities. Areas containing asbestos would not be subjected to hydroblasting. All technologies associated with Alternative CS-2 are commercially available and commonly used for cleaning and decontamination applications. Collected dust, and wipe cloths used for decontamination, could be treated and disposed of at an appropriate RCRA permitted facility, while decontaminated debris would be either recycled or disposed of appropriately.

Cost

The total capital, annual operation and maintenance, and present worth costs for both alternatives are presented in Table 11. The present worth cost of $136,000 for Alternative CS-1 is based on a five percent discount rate and 30-year period and is primarily associated with maintenance costs. Alternative CS-2, which has an estimated present worth cost of $1,691,000, would not incur annual operation and maintenance cost. Although Alternative CS-1 is less expensive than Alternative CS-2, it would not involve any treatment or be as protective as Alternative CS-2.

Comparison of Standing Water and Sediment (SW) Remedial Alternatives

This subsection compares the relative performance of each standing water and sediment remedial alternative using the specific evaluation criteria listed above. A summary of this comparative analysis is presented in Table 12.

Overall Protection of Human Health and the Environment

Alternative SW-1, the No Action alternative, would not provide protection of human health and the environment. Contaminated standing water and sediments on the site would continue to contaminate surface water and groundwater. Alternatives SW-2 and SW-3 would be protective of human health and the environment and achieve the remedial objectives because contaminated water and sediments would be removed from the site and treated and/or disposed. These alternatives would result in the reduction of toxicity, mobility and volume of contaminants. Alternative SW-2 would involve on-site treatment and disposal, and treated water would meet groundwater discharge requirements. Secondary wastes generated from treatment along with sediments removed from the site would be disposed of off site at an appropriate RCRA-permitted facility. Alternative SW-3 would remove contaminated surface water and sediments for disposal at an off-site, RCRA-permitted facility.

Compliance with ARARs

Alternative SW-1 would not comply with contaminant-specific ARARs. It would, however, comply with associated action-specific and location-specific ARARs. A complete list of ARARs for the site may be found in Tables 6, 7, 8 and 9.

OSHA Standards are ARARs that would be met by both Alternatives SW-2 and SW-3. All Federal and State standards applicable for recharge of treated wastewater to groundwater, including Maximum Concentration Levels (MCLs), would apply and be met by Alternative SW-2. Alternative SW-3, which involves off-site treatment and disposal, would meet DOT Rules for Hazardous Materials Transport and RCRA Requirements for Transporting Waste for Off-Site Disposal. The shipment of contaminated water containing hazardous constituents to an off-site treatment and disposal facility would be consistent with EPA's policy to ensure that the facility is authorized to accept such material in compliance with RCRA operating standards.

Alternative SW-2 would be designed to achieve contaminant-specific ARARS for groundwater recharge. Alternatives SW-2 and SW-3 would meet contaminant-specific, action-specific and location-specific ARARs.

Long-Term Effectiveness and Permanence

Alternative SW-1 would not provide removal or treatment but would provide site access restrictions. However, this would not be effective in the long term in preventing further contamination of surface water and groundwater.

Alternatives SW-2 and SW-3 would be effective in eliminating potential risks associated with on-site exposure through direct contact and ingestion of contaminated standing water and sediments. This alternative would also prevent further contamination of surface water and groundwater and off-site contaminant migration. Both alternatives would be permanent and effective in protecting the human health and the environment.

Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative SW-1, the No Action alternative, would not involve any removal, treatment or disposal of the contaminated standing water and sediments and, therefore, would not be effective in reducing the toxicity, mobility or volume of the contamination.

Alternatives SW-2 and SW-3 would effectively reduce the toxicity, mobility and volume of the contamination because these alternatives would completely remove contaminated standing water ponded throughout the site and in the basement of the refining building. These alternatives would also include disposal of sediments underlying the standing water in an appropriate, RCRA-permitted facility.

Short-Term Effectiveness

The implementation of Alternative SW-1 would not result in additional risk to the workers and the community, since no major remedial activities would be conducted. Alternatives SW-2 and SW-3 involve collection, treatment, and/or disposal of contaminated standing water and sediments. Alternative SW-2 would involve on-site treatment and disposal and require handling of chemicals and process byproducts, such as contaminated sludges, which would require appropriate disposal. The activities associated with Alternatives SW-2 and SW-3 would involve short-term risk to site workers. However, these risks could be minimized through implementation of the site-specific health and safety plan.

Off-site disposal of secondary wastes generated during treatment and sediments in Alternative SW-2 and transportation of contaminated water and sediments in Alternative SW-3 would pose a potential risk to the community from possible spillage during transit. Coordination with local traffic authorities would be required for these alternatives. Alternative SW-1 could take more than 30 years to achieve protection through natural attenuation of contaminated water. However, a period of 30 years was used for cost-estimating purposes. A period of fourteen months was estimated for Alternative SW-2. This estimate includes design and testing, bidding, contractor selection, mobilization, demobilization, and actual remediation time. Alternative SW-3 would require six months to achieve complete protection.

Implementability

All components of Alternative SW-1 would be easily implemented. This alternative simply requires access restrictions and a monitoring program. Alternative SW-2 would utilize relatively common treatment technologies and materials and is available from a number of vendors. However, it would require time to conduct a treatability study to define the design and operating parameters of the treatment process, and design and set up an on-site treatment facility to meet the stringent treatment levels required for groundwater recharge. Alternative SW-3 utilizes off-site treatment and disposal and would require less time and money to implement compared to alternative SW-2. There are only a few off-site treatment and disposal facilities available for aqueous waste treatment, but inquiries made by EPA indicate that adequate treatment and disposal capacity would be available.

Cost

The total capital, annual operation and maintenance and present worth costs for all standing water and sediment remedial alternatives are presented in Table 12. The present worth costs, based on a discount rate of five percent and a 30-year period, for Alternatives SW-1, SW-2 and SW-3 are $220,000, $1,335,000 and $993,200, respectively. Only Alternative SW-1 would require an annual operation and maintenance cost. Alternatives SW-2 and SW-3 would not involve operation and maintenance costs. Alternative SW-1 would be the least expensive, but it would not involve any treatment. Alternative SW-2 would be the most expensive standing water remedial alternative. Alternative SW-3 would be a less expensive alternative involving treatment and disposal.

THE SELECTED REMEDY

The evaluation of the alternatives in the previous section discussed each of the alternatives relative to criteria established under the Superfund law and regulations. The intent of the Early Remedial Action is to remediate those areas of the site that require an expedited response, and to implement remedial activities that will be consistent with the final remedy at the site.

Based on the results of the FFS, and after careful consideration of all reasonable alternatives, EPA and the New Jersey Department of Environmental Protection and Energy (NJDEPE) proposed utilizing the following alternatives for the Early Remedial Action at the NL site at the public meeting held on August 6, 1991:

SP-5: Solidification/Stabilization/On-Site Disposal of the Slag and Lead Oxide Piles

CS-2: Decontamination/Off-Site Treatment and Disposal of the Contaminated Surfaces and Debris

SW-3: Off-Site Treatment and Disposal of the Standing Water and Sediments

After considering public comments, the selected alternatives are the implementation of Alternatives SP-5, CS-2 and SW-3. Site risks have been identified as being primarily due to exposure to contaminated media and releases to the environment from the contaminated media. These risks would be eliminated through implementation of the selected remedy.

The selected alternatives represent the best balance of trade-offs among the criteria used to evaluate remedial actions. The selected alternatives meet the statutory requirements in CERCLA Section 121(b): 1) to protect human health and the environment; 2) to comply with ARARs; and 3) to be cost-effective. The selected alternatives utilize permanent solutions and alternative technologies to the maximum extent practicable and satisfy the statutory preference for treatment as a principal element.

EPA and NJDEPE believe that the selected remedy will reduce the threat to public health and the environment through the following sequence of actions. First, the slag and lead oxide piles, in addition to similar materials, would be treated using the solidification/ stabilization technology. Concurrently, buildings, paved surfaces, equipment and debris would be decontaminated. Subsequently, the contaminated standing water and water used for decontamination of buildings, etc., would be collected and transported for off-site treatment and disposal. Finally, drains would be decontaminated and unplugged. Through this sequence, the sources of contaminated runoff would be eliminated and water from future rain events would drain through these areas without transporting contamination off site.

In addition, materials for which markets can be found will be recycled. Recycling will allow recovery of contaminant resources in the waste materials and will result in permanent removal of these materials from the site. Materials will be recycled, providing that it can be done in a manner that is protective of human health and the environment, is cost-effective and can be accomplished in approximately the same time frame as the alternatives identified in the selected remedy.

The total present worth cost of the selected remedy is estimated to be $4,987,000 which includes treatment and on-site disposal of the slag and lead oxide materials, decontamination of debris and contaminated surfaces with off-site treatment and disposal, and off-site treatment and disposal of contaminated standing water and sediments. All off-site disposal will be at appropriate facilities. The capital cost is estimated to be $4,698,300.

Annual operation and maintenance costs are estimated to be $17,000.

The actual cost may vary due to a number of factors including the uncertainty in the precise amount of material that is amenable to the solidification/stabilization technology, the increase in volume after solidification/stabilization, and the exact amount of standing water and sediments present which will require off-site transportation and disposal.

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, establishes several other statutory requirements and preferences. These specify that, when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate environmental standards established for Federal and State environmental laws unless a statutory waiver is justified. The selected remedy must also be cost-effective and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the toxicity, mobility or volume of hazardous substances as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The three components of the selected remedy provide for protection of human health and the environment by removing the immediate and future risks posed by these hazardous materials on site. Contaminated slag and lead oxide materials will be treated on site using solidification/stabilization processes. The treated materials will then be placed on site in a protective manner pursuant to RCRA standards. Contaminated debris and surfaces will be decontaminated. Debris that could not be decontaminated will be transported to an appropriate off-site, RCRA-permitted facility. Any recyclable materials for which markets can be found will be recycled. Contaminated standing water and sediments will be transported off site for treatment and disposal. The selected remedy will significantly reduce the mobility and available toxicity of contaminants and will directly result in the reduction of risks posed by the presence of contaminants at the site. There will be no unacceptable short-term risks caused by implementation of this remedy.

Compliance with Applicable or Relevant and Appropriate Requirements

The three components of the selected remedy, SP-5, CS-2 and SW-3, will comply with all Federal and State requirements which are applicable or relevant and appropriate to its implementation.

Alternative SP-5 would be implemented to conform with all OSHA Standards, RCRA Land Disposal Restrictions (LDRs), RCRA Waste Management Standards, procedures for RCRA Identification of Hazardous Waste, and 40 CFR 264, Subpart X, which provides standards that are applicable to the on-site solidification/ stabilization of contaminated waste.

ARARS which apply to, and would be met by Alternatives CS-2 and SW-3, are OSHA Standards, DOT Rules for Hazardous Materials Transport, and RCRA Requirements for Transporting Waste for Off-Site Disposal.

Cost-Effectiveness

After evaluating all of the alternatives which most effectively address the principal threats posed by the contamination at the site and the statutory preference for treatment, EPA has concluded that the three components of the selected remedy afford the highest level of overall effectiveness proportional to their cost. The selected remedial action components are cost-effective because they provide the highest degree of protectiveness for human health and the environment in the both the long term and short term, compared to the alternatives evaluated, while representing a reasonable value for the cost.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The three components of the selected remedy provide the best balance among the alternatives with respect to the evaluation criteria. In particular, the selected remedy is able to maintain permanent protection of human health and the environment over the long term, once the remedy is completed. This remedy will reduce the mobility and available toxicity of the contaminants without adverse impacts on human health and the environment during the construction and implementation period.

In addition, materials for which markets can be found will be recycled. These materials may include, but would not be limited to, lead feedstock materials, scrap metal and equipment. Recycling will allow recovery of contaminant resources in the waste materials and will result in permanent removal of these materials from the site.

Services and materials needed for the implementation of the selected alternative are readily available and no technical or administrative difficulties are foreseen with the implementation of the remedy.

The State and community concur with the remedy, which meets the statutory requirements to utilize permanent solutions and treatment technologies to the maximum extent practicable.

Preference for Treatment as a Principal Element

The statutory preference for treatment is satisfied by the selected remedy, since principal threats posed by the slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments will be addressed through treatment and disposal of these contaminated materials. These treatment methods effectively reduce the mobility and toxicity of contaminants.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the NL site was released to the public in July 1991. The Proposed Plan identified the preferred alternative for addressing the slag and lead oxide piles, debris and contaminated surfaces, and contaminated standing water and sediments. EPA reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the selected remedy, as originally identified in the Proposed Plan, were necessary.

EPA has received a number of comments relative to the recycling of waste materials. As indicated in this document and discussed in the attached Responsiveness Summary, recycling will allow recovery of resources in the waste materials and will result in the permanent removal of these materials from the site. Consequently, EPA intends to pursue recycling of such materials and/or would allow PRPs to do so, if it could be implemented in a manner that is protective of human health and the environment and within a time frame comparable to the selected remedy.

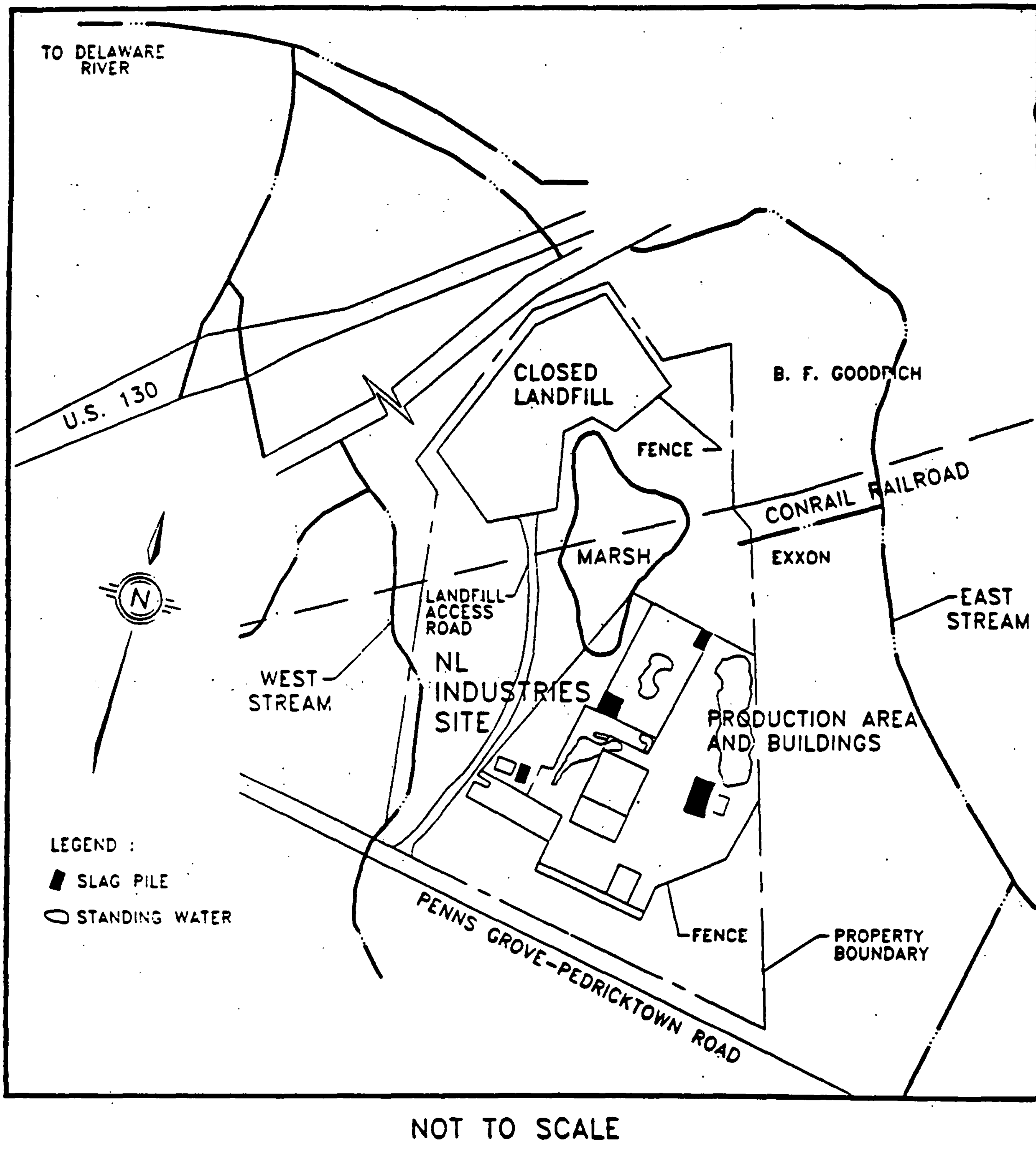

TO DELAWARE RIVER
U.S. 130
CLOSED LANDFILL
B. F. GOODRICH
FENCE
CONRAIL RAILROAD
MARSH
EXXON
LANDFILL ACCESS ROAD
EAST STREAM
NL INDUSTRIES SITE
WEST STREAM
PRODUCTION AREA AND BUILDINGS
LEGEND :
SLAG PILE
STANDING WATER
PENNS GROVE-PEDRICKTOWN ROAD
FENCE
PROPERTY BOUNDARY
N
NOT TO SCALE

FIGURE 1

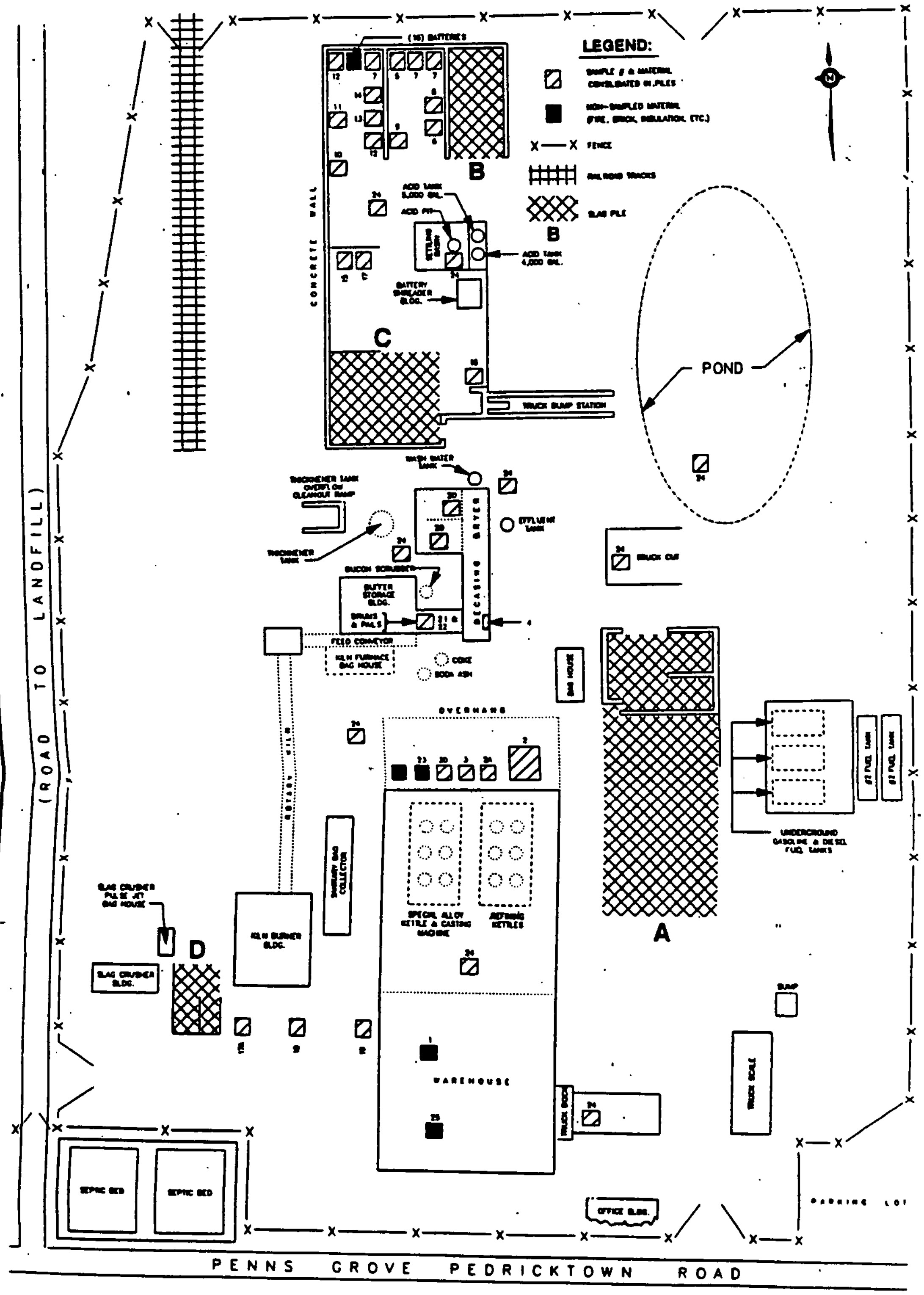


Figure 2

NL INDUSTRIES
PEDRICKTOWN, NEW JERSEY
DWN. NOT TO SCALE

TABLE 1

NATIONAL LEAD
RELOCATED WASTE INVENTORY

Sample #	Material	Estimated Volume
1	Litharge	31 drums
2	Baghouse Socks	120 drums
2A	Baghouse Socks	160 CY
3	Paper Bags	50 CY
4	Fiber Drum Parts	200
5	Battery Casing & Debris	250 CY
6	Lead Bearing Slag	4 CY
7	Slag & Debris	170 CY
8	White Powder (Lead Sulfate)	110 CY
9	Lead Hard Head Material	40 CY
10	Lead Debris	400 CY
11	Red Dross	40 CY
12	Soft Lead Dross	105 CY
13	Black Dross	10 CY
14	Orange/Yellow Dross	4 CY
15	Empty Metal Drums	80
16	Wood Pallets	350
17	Drum Covers/Parts	60
18	Plastic Debris	60 CY
19	Rubber Conveyor Belts	60 CY
20	Lead Oxide	40 CY
21	Oily Sludge	(3) 55-Gal. Drums (4) 5-Gal. Pails
22	Liquids	(7) 55-Gal. Drums
23	White Powder	(300) Bottles
24	Standing Water	1 Million Gals.
A,B,C,D	Slag Piles	9,800 CY

CY=Cubic Yards

TABLE 2

SUMMARY OF CHEMICAL CONSTITUENTS IN DIFFERENT WASTE STREAMS

NL Industries, Pedricktown, New Jersey

HSL INORGANICS		SLAG PILE * A		SLAG PILE * B		SLAG PILE * C		SLAG PILE * D		LEAD OXIDE * PILE		OTHER WASTE * AREA		DECONTAMINATION * BUILDING WIPE SAMPLES		STANDING ** WATER SAMPLES	
CAS No.	PARAMETER	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
7429-90-5	Aluminum	2100	20000	1010	5100	5000	8700	2370	9000	575	1210	15.4	16000	0.024	32.7	50.7	832.0
7440-36-0	Antimony	67.7	3040	123	19000	500	3130	47.4	2100	1490	2790	1.3	594000	0.0004	56.2	33.0	2000.0
7440-38-2	Arsenic	116	3300	224	842	877	1380	170	2910	293	614	0.0	30000	0.0009	17.6	0.0	80.0
7440-39-3	Barium	32.0	1360	33	474	742	2590	301	2930	10	220	0.15	11000	0.014	1.4	37.0	66.0
7440-41-7	Beryllium	1.5	6.9	2.5	7.2	4.4	10	1.2	9.3	0.55	0.65	0.011	14.9	0.0007	0.036	3.0	3.0
7440-43-9	Cadmium	39.5	359	22.4	271	162	1460	42.4	549	203	650	0.97	11300	0.0012	3.7	11.0	823.0
7440-70-2	Calcium	1360	8520	2310	14100	6020	8930	4270	14100	1550	3130	13	146000	0.063	91.2	3790.0	25900.0
7440-47-3	Chromium	51	640	185	1150	342	1440	210	7240	140	151	0.95	20000	0.0024	4.6	0.0	14.1
7440-48-4	Cobalt	11.1	260	33.5	300	29.1	96.4	0.1	103	4.3	9.0	0.07	103	0.0049	0.13	0.0	217.0
7440-50-8	Copper	830	8590	1330	7110	1410	4060	400	3090	132	674	2.1	14900	0	17	21.9	770.0
7439-89-6	Iron	32000	167000	60000	186000	129000	264000	10000	254000	10300	20300	141	349000	0.46	677	89.4	2420.0
7439-92-1	Lead	13500	193000	49400	252010	85700	226000	8950	151000	101000	437000	331	605000	0.08	552	160.0	4390.0
7439-95-4	Magnesium	812	13500	319	3880	791	2590	854	10100	233	1020	3.5	13900	0.24	9.9	1120.0	5170.0
7439-96-5	Manganese	149	1610	64.3	920	935	2030	237	1640	60.1	210	0.94	3290	0	5.5	14.7	320.0
7439-97-6	Mercury	0.063	0.71	0.069	0.76	0.08	0.26	0.072	0.16	1	1.6	0.034	64	0.0001	0.019	0.2	0.5
7440-02-0	Nickel	84.0	1070	137	633	330	1190	112	2620	130	342	1.4	3700	0.0087	3.2	14.0	343.0
7440-09-7	Potassium	2650	60400	3360	61000	17500	44300	6530	63700	11200	44800	101	66000	0.073	70	3160.0	10000.0
7782-49-2	Selenium	0.03	2.4	0.63	1.1	1.1	1.3	0.01	1.5	0.73	0.86	0.007	43.5	0.0007	0.004	5.0	50.0
7440-22-4	Silver	2	8.3	3	12	8.9	11	2.4	13	2.7	8.9	0.12	95	0.0024	0.37	7.0	9.0
7440-23-5	Sodium	2370	67500	5140	63100	19700	48700	5930	63900	12000	40600	61.9	69400	0.3	77.9	3630	690000
7440-28-0	Thallium	0.03	3.7	0.9	1.1	1.1	2.7	0.01	1.5	0.0	0.06	0.033	7.4	0.0009	0.003	6.0	6.0
7440-62-2	Vanadium	90.4	633	295	460	369	1630	317	554	9.4	17.3	0.61	785	0.0049	0.35	12.0	20.4
7440-66-6	Zinc	567	6030	1700	8420	1270	5600	696	7430	404	1630	25	69600	0.036	204	72.0	7230.0
	Cyanide													-			

* UNITS = mg/kg

** UNITS = ug/liter

TABLE 3

Results of the Metals Analysis

SLAG AND LEAD OXIDE PILES (1991)

Concentration reported in mg/kg

Client #	808794	808795	808796	808797	808798	808799	
Location:	Lead Oxide A	Lead Oxide B	A Pile	B Pile	C Pile	D Pile	
% Solids	88.0	97.1	99.3	88.4	93.2	74.4	DETECTION
Parameter:							LIMIT
Aluminum	1400	800	94000	8700	11000	12000	50
Antimony	970	2500	12000	1100	400	300	1
Arsenic	400	690	1000	1600	1400	1200	1
Barium	770	40	800	650	1400	1300	2.5
Cadmium	1000	800	300	50	350	260	2.5
Chromium	100	110	160	200	150	130	5
Copper	630	2400	31000	2750	2500	3060	5
Iron	12000	15000	130000	100000	110000	130000	10
Lead	480000	350000	130000	120000	130000	110000	50
Magnesium	780	860	19000	2000	1500	2040	5
Manganese	300	50	480	640	1100	1100	5
Mercury	2.10	2.60	0.02	0.10	0.02	ND	0.02
Nickel	380	630	640	890	470	800	5
Selenium	ND	ND	1	5	1	2	0.5
Silver	8	11	6	6	4	6	2.5
Zinc	1120	4000	40000	3500	3050	5570	2.5

ND denotes not detected

POOR QUALITY ORIGINAL

Appendix C

List of PRPs Who Were Sent General Notice Letters

List of Potentially Responsible Parties
To Whom EPA Sent a General Notice Letter
Dated June 20, 1991 Concerning
The NL Industries Inc. Superfund Site
Predericktown, New Jersey

Aaron Ferer & Sons Company
Ace Battery Company
Acme Alloys
American Freight Warehousing Company
Amlon Metals
Amspec Chemical
Ansam Metals Corporation
Anzon Inc./Associated Lead
Ashland Metals
AT&T Nassau Metals (Nassau Recyling Company)
Balmet Recycling
Belmont Metals, Inc.
Bonus Metal Canada, Inc.
C & D Battery Company
C. Tennants & Sons & Co./Carghill, Inc.
Canada Metals
City Metal Company
Delco-Remy Division, GMC
Douglas Battery
Elizabeth Herb & Metal
Exide Corporation
Freeway Scrap Battery, Inc.
Fundamental Minerals & Metals
Gale Industrial Scrap Iron & Metal Co.
General Metals & Smelting Co., Inc.
Gibson Metals
Gibson, Dunn & Crutcher, Trustee, NSNJ
Globe-Union/Johnson Controls
Golf Cars, Inc.
Gould, Inc.
Grant Manufacturing & Alloying, Inc.
Hammond Lead Products, Inc.
Kasmar Metals, Inc., c/o Paul A. Kasmar
Louis Mack Co., Inc.
Master Metals, Inc.
Mayer Alloys Corporation
McKinney Scrap Metal
Metal Bank of America
Minkin Industries, c/o Trustee
N. Bantivoglio's Sons, Inc.
NL Industries, Inc.
Reserve Trading Company
Resource Alloys & Metals
Riverside Metals Company
Robert L. Puckett, Director & President, NSNJ
Robert L. Puckett, Director & President, NSR
Sampson Tank Service
Seitzinger/Taracorp
Standard Metals, Inc.
Steven L. Zimmerman, PC, Trustee, NSR
Tennessee Chemical Company (Corp. HQ)
Thermal Reduction Corporation
Tonolli Trading Co.
U.S.S. Lead Refinery
USARCO
Wharton Enterprises

Sept. 5, 1991
307 JEFFERSON ST.
CARNEY'S POINT
NEW JERSEY, 08069

TO: MICHAEL GILBERT
REMEDIAL PROJECT MANAGER
U.S. ENVIRONMENTAL PROTECTION AGENCY
EMERGENCY & REMEDIAL RESPONSE DIVISION
26 FEDERAL PLAZA
ROOM 720
NEW YORK, NEW YORK, 10278

RE: NL INDUSTRIES SUPERFUND SITE
PEDRICKTOWN, NEW JERSEY

I HAVE REVIEWED THE PROPOSED REMEDIAL ALTERNATIVES SET FORTH FOR THE NL INDUSTRIES SITE. ALTHOUGH I CONCUR WITH THE AGENCY'S CHOICE OF REMEDIAL TECHNOLOGIES, I AM OF THE OPINION THAT AS MUCH OF THE LEAD WASTES AS POSSIBLE SHOULD BE REMOVED FROM THE SITE. THIS REMOVAL WOULD NOT ONLY INCLUDE THE SLAG PILES, BUT ALSO ALL BUILDINGS, UNSALVAGABLE PROCESS EQUIPMENT OR ANY OTHER DEBRIS OR STRUCTURES WHICH WOULD SERVE AS A REMINDER OF NL INDUSTRIES AND NATIONAL SMELTING. SINCE THIS SITE LIES IN AN OUTCROP AND RECHARGE ZONE OF THE RARITAN-MAGOTHY AQUIFER (AN IMPORTANT SOURCE OF DRINKING WATER FOR SOUTHERN NEW JERSEY) IT WOULD BE PRUDENT TO FURTHER REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION BY REMOVING WASTES RATHER THAN STABILIZING FOR DISPOSAL ON-SITE.

ADDITIONALLY, I BELIEVE THAT THE CLEAN-UP SHOULD BE EXPANDED TO INCLUDE CONTAMINATED STREAM SEDIMENTS (STREAMS DRAINING WEST TOWARDS RT. 130) OR ANY OTHER HIGHLY CONTAMINATED SOILS ON ADJACENT PROPERTIES.

FINALLY, IT IS MY OPINION THAT THE HEALTH OF NEIGHBORING

RESIDENTS WAS ADVERSELY AFFECTED DURING THE OPERATION OF THE SMELTER AND THAT THE POTENTIAL FOR ADVERSE HEALTH EFFECTS FROM LEAD STILL EXIST BEYOND THE PLANT BOUNDARIES. I ENCOURAGE THE AGENCY TO CONDUCT HEALTH STUDIES (INCLUDING BLOOD TESTS FOR LEAD) OF PAST AND PRESENT RESIDENTS. THE STATEMENTS OF THE REAL LIFE "MAXIMUM EXPOSED INDIVIDUALS" SUCH AS JAMES McCOURT HAVE BEEN SADLY IGNORED. IT WOULD NOT BE A DIFFICULT TASK TO DEVELOP A DISPERSION MODEL TO FIND OUT THE AREAS OF HIGHEST DEPOSITION.

IN ORDER TO DOCUMENT THE POTENTIALLY HAZARDOUS CONCENTRATIONS OF LEAD IN THE AMBIENT AIR DURING 1983, I HAVE ENCLOSED THE N.J.D.E.P. JANUARY 1984 REPORT ENTITLED: N.J. STATE IMPLEMENTATION PLAN FOR THE ATTAINMENT & MAINTENANCE OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS FOR LEAD. PLEASE REFER TO PAGE 35 WHERE A LEAD CONCENTRATION OF 1.81 MICROGRAMS/CUBIC METER IS RECORDED. BY COMPARISON, THE RECENT BOILER AND INDUSTRIAL FURNACE REGULATIONS (SEE 56 FR 7232) SET A REFERENCE AIR CONCENTRATION FOR LEAD AT 0.09 MICROGRAMS/CUBIC METERS, SOME 20 TIMES LOWER THAN THE 1983 LEVEL RECORDED.

YOUR CONSIDERATION OF MY COMMENTS IS DEEPLY APPRECIATED AND PLEASE FEEL FREE TO CONTACT ME FOR ANY QUESTIONS CONCERNING THIS MATTER.

SINCERELY,

Mitchell Press

MITCHELL PRESS

cc: BUD BRADFORD, MAYOR OLDMANS TOWNSHIP
YVETTE N. HARRIS, PUBLIC AFFAIRS SPECIALIST, EPA REGION II

Comments on the Proposed Plan and Focused Feasibility Study (FFS) for Operable Unit Two, NL Industries, Inc. Site, Pedricktown, New Jersey

Remedial Alternative for Contaminated Surfaces and Debris

EPA has proposed decontamination of contaminated surfaces and debris with off-site treatment and disposal as part of Operable Unit (OU) Two. At the threshold, we note that building contamination has also been considered in OU One, and recommend that EPA clarify which OU will address decontamination. The contaminated debris consists of lead dross, wooden pallets, baghouse bags, scrap metal and other materials present throughout the site. It is not clear that the debris and contaminated surfaces present similar risks, that similar cleanup criteria should be applied, or that similar remedial alternatives are available. Further the need for expedited cleanup of wooden pallets, scrap metal and other debris is unclear. NL Industries, therefore, recommends that the debris and building surfaces be evaluated separately.

The primary justification for including the buildings in an expedited remedial action, appears to be exposures from inhalation, ingestion and dermal contact with dust. It is recognized in the FFS (p. 1-4 and 1-5) that the limited access to the site, the securing of entrances to the contaminated buildings, and removal of valuable material from the site would effectively deter trespassers from the site and would reduce the dermal and ingestion exposure. The potential risks from these pathways were thus considered to be much lower compared to inhalation exposure (FFS p. 1-9).

However, it is not evident that any dust in the buildings, which has remained seven years after the cessation of operations, would be suspended in air and present a health threat via inhalation. The small layer of dust that may still adhere to the surfaces of the buildings presents an extremely limited source for wind erosion, and would not be readily susceptible to suspension. EPA has not provided any data to support the assumption that the inhalation pathway presents a potential health risk.

It should be noted that the preferred remedy does not provide any guidance on the acceptable cleanup level for the building surfaces. The cleanup objective should be established in consideration of future use scenarios. While decontamination and potential reuse of buildings may be feasible for the laboratory/office complex, the warehouse, and potentially the refining buildings, clearly the decaying operations, buffer storage and kilns have little value to non-smelting operations. NL asserts that demolition of some or of all the structures should be considered as a remedial option by EPA if it is a safer and/or more cost-effective remedial alternative. In addition, cleanup should take into account whether or not RCRA standards for off-site disposal apply.

Remedial Alternatives for Slag and Lead Oxide Materials

NL Industries agrees that solidification/stabilization of waste using a mobile treatment system, followed by on-site disposal is a reasonable alternative for management of slag and oxide materials. Several issues, however, are raised by the FFS and Proposed Plan which require clarification. First, there is some question of the ultimate quantity of material to be treated. Table 1-2 from the FFS suggests approximately 9,800 cubic yards (cy) of slag and 200 cy of lead oxide in piles on the paved area. The 1988 inventory, presented as Table 1 in the Remedial Investigation, indicated approximately 7,500 cy of slag and other lead bearing materials in the manufacturing area. The EPA is using a value approximately 30% higher than the 1988 inventory. The EPA stated in Section 5.2.4.1 of the FFS that the stabilization process might result in a volume change of as much as 40%, which seems high for this type of material. The EPA estimates 14,000 cy of stabilized materials to be disposed in an on-site RCRA Subtitle D landfill.

EPA should provide an analysis of appropriate sites for on-site disposal of the material, especially in the context of future use scenarios for the site. Examination of the attached Figure W-1 of the Remedial Investigation Report Volume IV suggests that wetlands and property boundaries preclude the use of unpaved areas of the property for the construction of the on-site landfill.

The construction cost presented in the FFS and Proposed Plan apparently includes no cost for construction of an on-site landfill. The cost estimate presented as Table B-4 of the FFS provides a cost of $4.34/cy for disposal on-site. This value may pay for the transfer of material from the curing location to a disposal location, however, it does not cover the construction cost of a landfill on-site.

Consideration should be given to the feasibility of placement of the stabilized material in the paved area at the site. For example, the basement of the refining building could contain approximately 1,500 cy of stabilized material. Placement of the remaining stabilized material at the north end of the paved manufacturing area (86,000 square feet) would require further analysis, and would likely involve dismantlement of all structures north of the refining building.

Remedial Alternative for Standing Water and Sediments

EPA's decision to remove the standing water from the property for off-site treatment is premature in that it neglects other contaminated water present at the site that will be addressed in the FS for OU One. OU One's FS will be completed by December 1991, prior to the completion time for implementation of this alternative. Therefore, it is logical that EPA consider the appropriateness of treating this waste stream with other OU One waste streams (e.g., contaminated ground water) in a common remedy.

G:\vfj\wp\n\1784acm2

If sand blasting is being conducted we can process the lead contaminated sand at $.10 per pound delivered in bulk containers. We feel Master Metals can be competitive in any disposal area where lead contamination is concerned by using proper recycling techniques and environmentally sound technology. I will be in touch after you review the above.

Sincerely,

Douglas K. Mickey
President
Master Metals Inc.

cc: Dillip Kothari Ebasco
WM Bradford

ENVIRON

August 16, 1991

Michael H. Gilbert
Project Manager
USEPA, Emergency & Remedial Investigation
Response Division
26 Federal Plaza
Room 720
New York, NY 10278

Re: NL Industries Superfund Site-Proposed Plan

Dear Mr. Gilbert:

Enclosed please find comments prepared on the Proposed Plan and Focused Feasibility Study (FSS) for Operable Unit Two, NL Industries, Inc. Site, Pedricktown, New Jersey by ENVIRON Corporation on behalf of NL Industries. NL Industries is providing additional comments under separate cover.

If you have any questions please call me at (703) 516-2340.

Sincerely,

Joyce S. Schlesinger, P.E.
Principal

JSS:vfj
G:\vfj\n\1784cmts.cvr

Enclosure

cc: Janet Smith, Esq.
Steve Holt
Dillip Kothari

ENVIRON Corporation · Counsel in Health and Environmental Science
4350 North Fairfax Drive, Arlington, Virginia 22203 · (703) 516-2300 · (800) ENVIRON · FAX (703) 516-2345

MASTER METALS, INC., 2850 W. THIRD ST., CLEVELAND, OHIO 44113 • (216) 621-2361 FAX 621-7475

Lead Smelter and Refiner

August 13, 1991

Mr. Michael Gilbert
Project Manager
U.S. EPA
Emergency and Remedial Response Division
26 Federal Plaza Room 720
New York, New York 10278

Dear Mr. Gilbert:

I would like to respond to the Superfund Proposed Plan N.I. Industries Inc., Pedricktown, New Jersey. In particular the slag and lead oxide piles and your method of action.

Background:

Master Metals is a TSD facility with approval to accept K069 and D008 wastes. We process lead residues through rotary furnaces and recylce the lead back to the end users. We have environmental improvement insurance and permits to operate the rotary furnaces. Our slag passes the TCLP leachate test and is diposed of at a sanitary land fill.

You are proposing Alternative SP-5: On site Solidification and Stabilization/ On site disposal for $2,303,100.00 . We would be willing to process the material at our facility in Cleveland. I feel we would accomplish this for approximately the same amount of money excluding transportation cost. We are already receiving material from your area and would arrange economical transportation. I am including a brochure on our company. I would hope that this idea would be of mutual interest that we could further discuss the possibility. I will call in a few days to see how we should proceed.

Sincerely,

Douglas K. Mickey
President

MASTER METALS, INC., 2850 W. THIRD ST., CLEVELAND, OHIO 44113 • (216) 621-2361 FAX 621-7475

Lead Smelter and Refiner

September 5, 1991

Mr. Michael Gilbert
Project Manager
U.S. EPA Region 2
Jacob K. Javits Federal Building
New York, New York 10278

Subject: Focused Feasibility Study Report
N.J. Industries Superfund Site
Operable Unit Two

Dear Mr. Gilbert:

Master Metals Inc. would like to respond to the summary of Remedial Alternatives for slag and lead oxide materials. As noted in previous correspondence, Master Metals Inc. is an approved and insured TSD facility for D008 and K069. We have several years experience in treating these waste streams and the characteristics of these two streams are indentical to materials we are currently processing. We have examined the characteristics and we are capable of handling the material at our facility.

I would like to briefly address the key components as they compare to alternative SP-1 SP-3 SP-4 SP-5. Criteria 1,2, 4 and 5 would be stated as in your executive summary. In criteria 3, Master Metals would have a definite advantage as this is proven technology and the operation is reliable. All the factors mentioned under 6 implementability for Master Metals facility are positive. The factors are as follows.

a) proven technology
b) no monitoring required after remediation
c) Lacy's Express Inc. has agreed to provide transportation. They are experienced and licensed in these matters.
d) history of proven experience
e) can complete remediation within 11 months

The cost we propose including freight is $2,690,000. This cost is 10% higher than your recommendation, however the material will no longer remain on site.

We would also be interested in materials from building, demolition, sand blasting or sediments. The building components would have to be estimated depending on the scope of the demolition.

Also, the Proposed Plan requires the placement of stabilized materials in a RCRA Subtitle D landfill. We are concerned about the consistency of this requirement with any remedy prescribed for Operable Unit I at a later date. If other materials at the site must be placed in a landfill, it may be uneconomical to design a separate landfill at a later time. Consequently, we request that U.S. EPA include in its Record of Decision provisions which allow the party conducting the remedial action the option of storing the stabilized material in the interim or designing a landfill which will accommodate all site materials. Since the Record of Decision on Operable Unit I is expected next year, well before the remedial design for Operable Unit II is completed, allowing either interim storage or proper sizing of the landfill as alternatives will help to assure that the remedy is cost-effective without creating any long-term problems.

With respect to the ponded stormwater, we have obtained estimates which indicate that one million gallons of water could be treated on-site in a rental unit for less than $100,000. Also, while off-site disposal costs may be considerably less that U.S. EPA estimated, they are expected to be significantly greater than the rental unit cost. U.S. EPA determined that both remedies satisfy NCP criteria, but hypothesized that off-site disposal would be cheaper (a questionable conclusion). We propose that U.S. EPA permit whoever performs the remedial action to choose the more cost-effective alternative.

Also, we request that U.S. EPA permit whoever performs the remedial action to use ponded stormwater in the stabilization process. There is no point in using clean water. Furthermore, in the event on-site treatment of the ponded stormwater is utilized, we request that U.S. EPA permit the use of treated water for building decontamination and cleaning to lessen the amount of treated water which must be discharged.

Thank you for the opportunity to submit these comments.

Very truly yours,

JOHNSON CONTROLS, INC.

Jean M. Beaudoin
Manager, Environmental Relations

cc: AT&T
Allied-Signal
C&D Charter Power Systems
Exide Corp.
Gould Inc.

Has consideration been given to the potential future need to reclean the facility if subsequent remedial activities at the site result in recontamination of surfaces? Has adequate consideration been given to possible recycling of dust, lead dross, scrap metal, and other materials which may be generated from these activities?

2. Alternative CS-2 notes that "debris that could not be decontaminated, such as contaminated baghouse bags, along with collected dust, would be transported to an appropriate off-site RCRA hazardous waste treatment and disposal facility". Exide Corporation believes that baghouse dusts, as well as baghouse bags from a secondary lead smelter, are classified as K069 listed wastes pursuant to EPA regulations under the Resource Conservation and Recovery Act. The EPA land disposal restrictions prohibit the disposal of these types of materials and mandate thermal recovery (i.e., secondary lead smelting). EPA's proposed plan with respect to the disposal of baghouse dusts and baghouse bags, therefore, is a violation of RCRA.

Exide Corporation appreciates the opportunity to provide comments on EPA's proposed early remedial action plan and also on your letters which had previously been submitted to this office. In addition, Exide Corporation looks forward to the reopening of discussions with EPA personnel regarding the potential recycling of materials from the site at the Exide/General Battery Corporation facility in Reading, Pennsylvania or at other authorized secondary lead recycling facilities.

Should additional information or clarification be required or should you wish to discuss this matter in further detail, please contact this office at (215) 378-0852.

Very truly yours,

EXIDE CORPORATION

Jeffrey A. Leed /sb

Jeffrey A. Leed
Director - Environmental Resources

JAL:sb

Johnson Controls, Inc.
Battery Group
5757 N. Green Bay Avenue
Post Office Box 591
Milwaukee, WI 53201-0591
Tel. 414/228 1200

VIA FEDERAL EXPRESS

JOHNSON CONTROLS

Michael H. Gilbert, Project Manager
United States Environmental
Protection Agency
Region II
Jacob K. Javits Federal Building
New York, New York 10278

September 5, 1991

Re: NL Industries Superfund Site
Pedricktown, New Jersey

Dear Mr. Gilbert:

We are corresponding on behalf of AT&T, Allied-Signal, C&D Charter Power Systems, Exide Corp., Gould Inc., and Johnson Controls, with comments regarding the Proposed Plan for Operable Unit II at the NL Industries/NSNJ Superfund Site in Pedricktown, New Jersey. By submitting these comments, the parties make no admission regarding liability for response actions and specifically deny all such liability. The remedy proposed by the United States Environmental Protection Agency ("U.S. EPA") for Operable Unit II includes three major components: stabilization of slag and oxide, building cleaning, and treatment of ponded stormwater.

We are concerned with sequencing of the remedy components. Sequencing should assure that any further stormwater which falls at the site remains clean. The slag and oxide should be addressed first so that handling of these materials does not result in any hazardous substances which may be present at the site migrating to already cleaned areas. The buildings should be addressed next, with water treatment beginning for each building as any wash water is generated and in turn for the ponded water around each building, with immediate cleaning of the underlying areas so future stormwater remains clean.

Our next concern is the choice of remedy for the slag and/or oxide. U.S. EPA apparently agrees that recycling is an appropriate remedy, but elected stabilization and on-site disposal in its Proposed Plan because it could not find a recycling vendor. However, our conversations with recyclers indicate that U.S. EPA may be incorrect in dispensing with the recyling option. Also, U.S. EPA did not explore the possibility that recyclers could be paid for their efforts at a rate considerably less than that for stabilization and disposal. Accordingly, we request that U.S. EPA identify alternate remedies (recycling and the remedy set forth in the Proposed Plan) in its Record of Decision so that whoever undertakes the remedial action can choose between them during the remedial design phase according to relative cost-effectiveness.

3. As you may also know, Exide Corporation and the Center for Hazardous Materials Research (CHMR), Pittsburgh, Pennsylvania, have recently received authorization, through the EPA SITE Emerging Technology Program, to investigate the potential for utilizing secondary lead smelters for the recovery of lead from materials removed from Superfund sites. As part of the effort with CHMR, it is anticipated that the Exide/GBC Reading, Pennsylvania facility will be utilized to investigate the recovery of lead from a diverse variety of materials.

   Exide Corporation has recently received authorization from EPA Region III for the removal of five loads of battery case materials from the Tonolli Corporation Superfund site in Nesquehoning, Pennsylvania, an activity which has been scheduled to begin on September 5, 1991. The test of the Tonolli materials represents the first actual test which Exide/GBC will conduct of materials from an NPL site, despite the fact that the processing of materials from the Brown's Battery site and the Hebelka site, both in Pennsylvania, have already been discussed with Region III personnel. Exide Corporation is willing to initiate further activities with EPA Region II to determine the feasibility of recycling materials from the NL Pedricktown site.

With respect to the information in your letter of July 16, 1991 regarding the proposed plan for early remedial action for operable unit two at the NL Pedricktown site, Exide Corporation provides the following comments:

STANDING WATER AND SEDIMENTS

1. If treatability studies have not been conducted as noted in the discussion of alternative SW-2, Exide Corporation questions whether EPA has considered all available and appropriate options for treatment and management of standing water and wastewater. Have options for treatment of water been considered with possible discharge into the sanitary sewer in lieu of groundwater recharge? (Table 6-1 of the June 8, 1990 Final Removal Action/Feasibility Study Report prepared by Roy F. Weston, Inc. suggests the option of local sewer discharge). Have potential options for recycling of contaminated sludges and sediments been considered?

SLAG AND LEAD OXIDE PILES

1. Exide Corporation does not understand EPA's basis for comparing lead levels in slag to EPA's Interim Guidance on Establishing Soil Lead Clean-up Levels in residential soils at Superfund Sites.

2. While EPA has considered treatment options such as flame reaction, hydrometallurgical leaching, and solidification/stabilization (options SP-3, SP-4, and SP-5, respectively) for the slag and lead oxide, recycling through a secondary lead smelter has not been fully considered. As noted in the discussion above, Exide Corporation believes that, because of the lead content in these materials, some of them may be recyclable and further consideration of this option is warranted.

3. As noted in the EPA third-third land disposal restrictions published in the Federal Register on June 1, 1990, the U.S. EPA has acknowledged that inorganic solid debris which exhibits a toxicity characteristic represents a unique treatability group of materials due to the inherent difficulties in stabilizing these wastes. In fact, the Agency recognized the inherent difficulties associated with stabilization and subsequently issued a National Capacity Variance until May 1992. The EPA statements and alternative SP-5 which indicate that "bench-scale tests would be required" to evaluate this option, suggest that EPA may not have considered the potential need to process the slag prior to stabilization, to control dust from this operation, and/or to properly collect and treat wastewater which may be generated. In addition, the agency appears to have selected this option without bench-scale tests and thus with little, if any, knowledge about the amount of solidification agents which would be needed to stabilize these materials. Given the potential uncertainties associated with the feasibility and costs associated with this option, it is suggested that bench-scale tests be conducted to evaluate this option against the potential recycling alternative. Indeed, it may also be necessary to perform independent evaluations on the slag and lead oxide as the results of the evaluations may be different.

DEBRIS AND CONTAMINATED SURFACES

1. Exide Corporation questions whether the EPA has fully evaluated all options associated with debris and contaminated surfaces and whether all of this work is required at this time.

EXIDE CORPORATION

AIRBORNE-EXPRESS- RETURN RECEIPT REQUESTED

September 5, 1991

Mr. Michael H. Gilbert
Project Manager
Southern New Jersey Compliance Section
U.S. Environmental Protection Agency
Region II
Jacob K. Javits Federal Building
New York, NY 10278

RE: NL Industries, Inc. Site
Pedricktown, New Jersey

Dear Mr. Gilbert:

Exide Corporation is in receipt of your letters dated September 24, 1990 and January 24, 1991 which provide analytical information regarding materials which are stored at the NL Industries, Inc. site in Pedricktown, New Jersey. In addition, Exide Corporation has also received your letter of July 16, 1991 which summarizes the options which EPA has considered for early remedial action at the site and which also documents EPA's proposed plan for addressing several areas of surface contamination.

At the outset of our response to your letters, Exide Corporation wishes to advise your office that Exide is participating with a number of other companies who are also intending to provide additional comments to your office about EPA's proposed early remedial plan. Exide Corporation's comments in this letter, therefore, should be viewed as a supplement to the information in that letter. In this letter, Exide Corporation intends to focus specifically on several portions of the early remedial plan and the potential for secondary lead smelters to reclaim materials from the NL site. Exide Corporation has not responded to your earlier letters due to the previous litigation with NL regarding the Pedricktown site and due to other on-going efforts at other former NL facilities throughout the United States.

Exide submits these comments, and is participating with other parties in the submission of joint comments, because it has a general interest in seeing that all proposed response actions, as identified by EPA at this and other sites, are protective of human health and the environment while remaining cost effective. Exide also has a direct interest in the remedy for this site because EPA may consider using Exide secondary lead smelter facilities for managing the waste material at the site. Exide has also been identified by EPA as a potentially responsible party. Exide specifically denies any and all liability for response actions at

645 Penn Street Reading, PA 19601
P.O. Box 14205 Reading, PA 19612-4205
215/378-0500 TWX 510/651-5288 Telecopier 215/378-0616

the site and reserves all available rights and privileges that may be asserted in defense of any allegations of such liability.

With respect to the information contained in your letters of September 24, 1990 and January 24, 1991, Exide Corporation wishes to provide the following comments:

1. The lead concentrations in some of the on-site materials are sufficiently high to allow for consideration to be given to the recycling of some of these materials at secondary lead smelters. A listing of secondary lead smelters in the United States is attached.

2. The Exide/General Battery Corporation facility in Reading, Pennsylvania is a RCRA permitted treatment and storage facility, permitted under U.S. EPA ID# PAD990753089 by the U.S. Environmental Protection Agency and the Pennsylvania Department of Environmental Resources in November 1988. In addition, the Exide/GBC Reading facility also operates under appropriate authorizations and permits for air emissions and discharge of treated wastewater. Additional analytical information would be needed for Exide/GBC to evaluate the feasibility of recycling these materials and to evaluate the costs associated with this activity. Other details related to packaging of the materials at the NL site, loading, and transportation would also need to be known before the costs could be assessed.

   Exide understood that the previous EPA requests for "utilization" of the NL materials were based on the need for Exide to load and transport the materials, to pay the costs for recycling the materials, and to pay the costs for disposal of byproducts generated from recycling operations. Under this scenario, this office does not believe that recycling would have been economically viable to Exide Corporation. If EPA is willing to reimburse Exide to help defray our recycling expenses, Exide Corporation is willing to discuss this matter. Exide believes that recycling is an option which will be more environmentally acceptable and less costly than stabilization with long term storage or disposal.

   Page 1-5 of the EPA Focused Feasibility Study indicates that EPA made several inquiries to parties that may have been interested in removing the slag for recycling and that "...no positive responses were received, primarily due to the low lead content of the slag and lead oxide piles." In Exide Corporation's case, this is not an accurate statement.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

EPA EXTENDS PUBLIC COMMENT PERIOD FOR THE NL INDUSTRIES SUPERFUND SITE IN PEDRICKTOWN , NEW JERSEY

The U.S. Environmental Protection Agency (EPA) has extended the public comment period for the NL Industries Superfund Site in Pedricktown, New Jersey to Friday , September 6, 1991. Copies of the Proposed Plan, which discusses the preferred remedial alternative, as well as copies of the Focused Feasibility Study can be reviewed at :

Penns Grove Public Library
South Broad Street
Penns Grove, New Jersey 08069

All written comments on Proposed Plan may be sent to Michael Gilbert, Remedial Project Manager, U.S. Environmental Protection Agency , Emergency & Remedial Response Division, 26 Federal Plaza, Room 720 , New York, New York 10278

For additional information please contact Yvette Harris, Community Relations Coordinator at 212 264-9368

Appendix B

NL Industries, Inc. Written Comments on the Proposed Plan and Focused Feasibility Study

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
PUBLIC MEETING
FOR
NL INDUSTRIES SUPERFUND SITE
PEDRICKTOWN, NEW JERSEY

AUGUST 6, 1991
MEETING ATTENDEES

(Please Print)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING
E J Rosinski	P.O. Box 4	Pedricktown	08067	299-4653	[illegible] & Environmental Committee
Sam Picken	72 W. Mill ST	Pedricktown	08067	609-299-6307	Oldmans Twp Emerg. Management
Mitchell Press	307 Jefferson St.	Carney's Pt.	08069	609-299-6711	SELF
[illegible]	[illegible]	Pedricktown	[illegible]	609-299-6314	SELF (H[illegible])
Hiram D. Griffin	RD 1 Box 204 C	Pedricktown	08067	609-299-4478	Self (Home owner)
Tina Nipe	RD#1 Box 198B	Pedricktown	08067	609-299-7015 / 609 678 [illegible]	Self
Jane Embury	RD 1, Box 61	Pedricktown	08067	609-299-7[illegible]	Self
[illegible]	145A [illegible] Rd	Pedricktown	[illegible]	[illegible] / 299 3752	Self
~~John [illegible]~~	~~RD 1 Box 264.4~~	~~Pedricktown~~	~~08067~~	~~299-1172~~	~~SELF~~
Beth [illegible]					
Charles Perry	Helen Ave	Pedricktown	08067	299-5150	SELF
[illegible]	325 [illegible]	—			
[illegible]	P.O. Box 1090	Hightstown	08520	443-2405	NL
[illegible]	473 Spruce [illegible]	[illegible]	14106	924-1854	[illegible]
Paul Harvey					NJDEP

[illegible]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
PUBLIC MEETING
FOR
NL INDUSTRIES SUERFUND SITE
PEDRICKTOWN, NEW JERSEY

AUGUST 6, 1991
MEETING ATTENDEES

(Please Print)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING
Terrie + George [illegible]	RD 1 Box 334B	Pedricktown	08067	(609) 299-1461	Self
[illegible]	Rd 1 Box 223	Pedricktown	08067	609-299-0528	Self
[illegible]	RT 130 Box 151	PED	08067		SELF
Mildred Hyatt	72 N. RR	Ped.	08067	299-0780	
George [illegible]	9 Main St. - (Auburn)	Pel.	08085	299-5358	Township [illegible]
[illegible]	93 5th St [illegible]				[illegible]

SLAG & LEAD OXIDE PILES
SP-5:Solidification/Stabilization/On-Site Disposal

SURFACES AND DEBRIS
CS-2:Decontamination/Off-Site Treatment and Disposal

STANDING WATER
SW-3:Off-Site Treatment and Disposal

The preferred alternatives represent the best balance of trade-offs among the criteria used to evaluate remedial actions. Based on the information available at this time, the preferred alternatives would be more protective than competing alternatives, attain ARARs, be cost-effective and would use permanent and complete treatment technologies to the maximum extent possible.

First, the slag and lead oxide piles, in addition to similar materials, would be treated using the solidification/stabilization technology. Concurrently, buildings, paved surfaces, equipment and debris would be decontaminated. Subsequently, the contaminated standing water and water used for decontamination of buildings, etc., would be collected and transported for off-site treatment and disposal. Finally, drains would be decontaminated and unplugged. Through this sequence, the sources of contaminated runoff would be eliminated and water from future rain events would drain through these areas without transporting contamination off site.

SUMMARY OF THE PREFERRED ALTERNATIVES

Remedial Alternative	Present Worth Cost ($1000)	Months to Achieve Remedial Objectives	Comments
SLAG & LEAD OXIDE PILES (SP-5:Solidification/ Stabilization/On-Site Disposal)	$ 2,303	Fifteen	Protective, reduces mobility and exposure to toxicity, readily implemented, cost-effective
SURFACES AND DEBRIS (CS-2:Decontamination/ Off-Site Treatment and Disposal)	$ 1,691	Twelve (can be concurrent w/Alternative SP-5)	Protective, reduces toxicity, mobility, and volume, readily implemented, permanent
STANDING WATER (SW-3:Off-Site Treatment and Disposal)	$ 993.2	Six	Protective, reduces toxicity, mobility and volume, cost-effective permanent
ESTIMATED TOTAL	$ 4,987		

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

Representatives From The

U.S. Environmental Protection Agency

Invite You To Attend

A Public Meeting

Purpose: To discuss the activities at the NL Industries Superfund Site

Date: Tuesday, August 6, 1991

Time: 7pm

Place: Oldsman Middle School, Freed Road, Pedricktown, NJ

For further information please contact Yvette Harris, Community Relations Coordinator at (212) 264-9368.

placed in accordance with RCRA treatment standards to alleviate this concern. The technology is widely available, proven effective for inorganics, cost-effective and readily implementable.

Alternatives SP-3 and SP-4 would be effective in the long and short term in protecting human health and the environment and would result in a reduction of toxicity, mobility and volume of the slag and lead oxide piles. However, these alternatives have not been utilized at Superfund sites and are more expensive than Alternative SP-5. Furthermore, Alternative SP-3, which involves a flame reactor, is considered an innovative technology and implementability on a commercial scale has not been proven. Markets have not been identified for the process byproducts associated with this alternative; this may further increase costs. Alternative SP-4, which uses a hydro-metallurgical leaching process, may require a series of steps to leach multiple contaminants. This alternative would also produce a slag and lead oxide residue which would require disposal, in addition to large amounts of liquid wastes generated during the process.

Given the site conditions, solidification/stabilization offers the greatest certainty for treating the slag and lead oxide piles. Accordingly, RCRA treatment standards should be readily achievable after treatment has immobilized the waste materials.

Occupational Safety and Health Administration (OSHA) Standards, RCRA Land Disposal Restrictions (LDR), RCRA Subtitle D Nonhazardous Waste Management Standards and RCRA Identification of Hazardous Waste, which defines the TCLP to characterize a waste as being hazardous, are ARARS which apply to, and would be met by, Alternatives SP-3, SP-4 and SP-5. Department of Transportation (DOT) Rules for Hazardous Materials Transport and RCRA Requirements for Transporting Waste for Off-site Disposal would apply and be met by Alternative SP-3. Alternative SP-5 would comply with 40 CFR 264, Subpart X, which provides standards that are applicable to the on-site solidification/stabilization of contaminated waste.

CONTAMINATED SURFACES AND DEBRIS

Alternative CS-2, decontamination of contaminated surfaces and debris with off-site treatment and disposal is the only alternative which would satisfy the criteria. It would be permanent and effective in protecting human health and the environment, completely reduce mobility, toxicity and volume of the contamination at the site, and be readily implementable. ARARS which apply to, and would be met by, this alternative are OSHA Standards, DOT Rules for Hazardous Materials Transport, and RCRA Requirements for Transporting Waste for Off-site Disposal.

Short-term risks associated with dust emissions and accidents would exist, but could be mitigated by protective equipment and adherence to the site-specific health and safety plan. Long-term reliable protection would be achieved by removing the material from the site. There would be no operation and maintenance costs for this alternative.

STANDING WATER

Alternative SW-3, which involves off-site treatment and disposal of contaminated standing water and sediments, would eliminate the future threat of on-site exposure and off-site contaminant migration. It would be permanent and effective in protecting human health and the environment, comply with ARARs, completely reduce mobility, toxicity and volume of the contaminated water and be readily implementable. For the estimated one million gallons of standing water, it would be the more cost-effective than Alternative SW-2. There would be no operation and maintenance costs for this alternative.

Alternative SW-2, which involves on-site treatment followed by groundwater recharge, would also be effective and permanent in protecting human health and the environment. It would reduce the toxicity, mobility and volume of contamination through treatment to required Federal and State discharge standards.

Short-term risks associated with operation of the treatment system could be mitigated by protective equipment and adherence to the site-specific health and safety plan. Long-term reliable protection would be achieved by removing the contaminated water from the site.

Alternative SW-2, would require more time to implement than Alternative SW-3 and be more costly, while being no more effective in meeting remedial objectives. Alternative SW-2 would require time to conduct a treatability study to define the design and operating parameters of the treatment process, and design and set up an on-site treatment facility to meet the stringent treatment levels required for groundwater recharge.

OSHA Standards are ARARs that would be met by both Alternatives SW-2 and SW-3. All Federal and State standards applicable for recharge of treated wastewater to groundwater would apply and be met by Alternative SW-2. Alternative SW-3, which involves off-site treatment and disposal, would meet DOT Rules for Hazardous Materials Transport and RCRA Requirements for Transporting Waste for Off-site Disposal. The shipment of contaminated water containing hazardous constituents to an off-site treatment and disposal facility would be consistent with EPA's policy to ensure that the facility is authorized to accept such material in compliance with RCRA operating standards.

SUMMARY OF THE PREFERRED ALTERNATIVE

The evaluation of the alternatives in the previous section discussed each of the alternatives relative to criteria established under the Superfund law and regulations. The intent of the Early Remedial Action is to remediate those areas of the site that require an expedited response, and to implement remedial actions that will be consistent with the final remedy at the site.

After careful consideration of all reasonable alternatives, EPA proposes utilizing the following alternatives for the Early Remedial Action at the NL site:

Alternative SW-3: Off-Site Treatment and Disposal

Capital Cost:	$993,200
Annual O&M Costs:	$0
Present Worth Cost:	$993,200

Months to Achieve Remedial Action Objectives: Six

This alternative would consist of collecting approximately one million gallons of standing water in approximately 200 tanker trucks and transporting it to an off-site, RCRA-permitted treatment facility, which would be capable of accepting the water with no pretreatment at the site. Wash water, which would be generated from the decontamination of contaminated surfaces and debris, would also be transported with the standing water. Sediments would be transported to an off-site treatment and disposal facility that would be capable of accepting this material. Samples of the contaminated water and sediments would be sent to the treatment facilities to ensure waste acceptance. As part of this alternative, drains would be unplugged and cleaned, which in conjunction with the decontamination of buildings and paved surfaces, would prevent contaminated runoff from leaving the site in the future.

EVALUATION OF ALTERNATIVES

The nine criteria used to evaluate all remedial alternatives fall into four categories: environmental/public health protectiveness, compliance with required cleanup standards, technical performance and cost. In addition, the selected remedy should result in permanent solutions and should use treatment to the maximum extent practicable. This section discusses and compares the performance of the remedial alternatives under consideration for each source against these criteria. The nine criteria are summarized below:

Overall Protection of Human Health and Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of Federal and State environmental statutes and/or provide grounds for invoking a waiver.

Long-term Effectiveness and Permanence refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once remedial objectives have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment is the anticipated performance of the disposal or treatment technologies that may be employed in a remedy.

Short-term Effectiveness refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost refers to estimates used to compare costs among various alternatives. Costs include both capital and operation and maintenance costs. Cost comparisons are made on the basis of the present worth value, of the entire cost of the alternative, at the beginning of construction.

State Acceptance will be assessed in the Record of Decision following a review of the State's comments received on the FFS report and the Proposed Plan. The NJDEP concurs with the proposed remedy.

Community Acceptance will be assessed in the Record of Decision following a review of the public comments received on the FFS report and the Proposed Plan.

NO ACTION

The No Action alternatives SP-1, CS-1, and SW-1 would not provide protection of public health or the environment or any effective remediation in the long or short term. Contaminants would remain in their present state, with little or no reduction in toxicity, mobility or volume. Potential risks due to exposure to and migration of contaminants would remain. The No Action alternatives are the simplest to implement from a technical standpoint, since they only involve actions to inspect and sample the site periodically, ensure restricted site access, and continue to provide information about the site to the surrounding community.

Since the No Action alternatives SP-1, CS-1 and SW-1 would not be protective of human health and the environment or comply with ARARs, they are eliminated from further consideration for the preferred alternatives.

SLAG AND LEAD OXIDE PILES

Alternative SP-5, which involves solidification/stabilization of the slag and lead oxide piles, would be effective and permanent in reducing risks to human health and the environment. Materials of similar composition to the slag and lead oxide, such as certain lead feedstocks, would be treated with these materials. Solidification/stabilization would be relatively simple to implement, since a one-step mixing and placement process is used. This alternative would treat these wastes to be nonhazardous, which would be ensured by testing according to the TCLP.

The treated material would be placed on site in accordance with RCRA treatment standards. For cost-estimating purposes, it was assumed that the on-site placement would meet RCRA Subtitle D requirements, although the actual disposal requirements would be defined in design, pending treatability studies. Toxicity of the hazardous constituents of the materials would be reduced in that they would be immobilized in the stabilized mass and no longer present a direct contact threat. Mobility would also be reduced and volume may increase up to 40 percent, depending upon the specific treatment process. Although some long-term uncertainties regarding the integrity of the stabilized mass have been raised, solidification/stabilization is preferable for treating inorganic contamination and will inhibit leaching of contaminants. Furthermore, efficacy testing will be conducted and the material will be lead-rich, potentially marketable product. The caustic leaching solution would be recycled through the process. The resulting treated material would require testing according to the TCLP to confirm that the material is nonhazardous. There would be no significant reduction in volume of the material. The treated material would be redeposited on site in accordance with Resource Conservation and Recovery Act (RCRA) treatment standards. For costing purposes, it was assumed that on-site placement would meet RCRA Subtitle D landfill requirements.

Alternative SP-5: On-Site Solidification/Stabilization/ On-site Disposal

Capital Cost:	$2,014,000
Annual O&M Costs:	$17,000
Present Worth Cost:	$2,303,100

Months to Achieve Remedial Action Objectives: Fifteen

This alternative would stabilize the existing waste on site by using a mobile treatment system. This technology immobilizes contaminants by binding them into an insoluble matrix. Stabilizing agents such as cement, pozzolan, silicates and/or proprietary polymers would be mixed with the feed material. The equipment is similar to that used for cement mixing and handling. Bench-scale tests would be required to select the proper quantity of stabilizing agents, feed material, and water. Depending on the specific treatment process, the stabilized volume may increase up to 40 percent of the original volume. The stabilized material would require testing according to the TCLP to confirm that the material is nonhazardous. Disposal of the treated material would occur on site in accordance with RCRA treatment standards. For costing purposes, it was assumed that on-site placement would meet RCRA Subtitle D landfill requirements.

Debris and Contaminated Surfaces

Alternative CS-1: No Action

Capital Cost:	$17,700
Annual O&M Costs:	$6,800
Present Worth Cost:	$136,000

Months to Achieve Remedial Action Objectives: N/A

The No Action alternative for contaminated surfaces and debris provides a baseline against which other alternatives may be compared. Contaminated debris, equipment and surfaces would be left in their current condition. Roofs would be repaired where necessary and a long-term maintenance program would be implemented to ensure that the buildings are not accessible. In addition, assessments would be performed every five years to determine the need for further actions.

Alternative CS-2: Debris and Contaminated Surfaces Decontamination/Off-Site Treatment and Disposal

Capital Cost:	$1,691,100
Annual O&M Costs:	$0
Present Worth Cost:	$1,691,100

Months to Achieve Remedial Action Objectives: Twelve

This alternative would involve decontaminating the contaminated building surfaces, debris (i.e., scrap metal, pallets, etc.) and equipment using dusting, vacuuming and wiping procedures. Parts of the buildings and surfaces which could withstand high water pressure would be cleaned by hydroblasting. Materials would be recycled where possible. Debris that could not be decontaminated, such as contaminated baghouse bags, along with collected dust, would be transported to an appropriate off-site RCRA hazardous waste treatment and disposal facility. Contaminated wash water would be treated with the on-site standing water.

Standing Water and Sediments

Alternative SW-1: No Action

Capital Cost:	$0
Annual O&M:	$10,700
Present Worth Cost:	$220,100

Months to Achieve Remedial Action Objectives: N/A

The No Action alternative for standing water provides a baseline against which other alternatives may be compared. This alternative would rely on natural attenuation of contaminated standing (rain) water without any treatment. Drains would remain plugged and contaminated. Contaminated standing water would be likely to continue to overflow the site into the West Stream. This alternative would include annual monitoring of groundwater, surface waters and soils in and around the site to track contaminant migration. In addition, assessments would be performed every five years to determine the need for further actions.

Alternative SW-2: On-Site Treatment and Groundwater Recharge

Capital Cost:	$1,335,000
Annual O&M Costs:	$0
Present Worth Cost:	$1,335,000

Months to Achieve Remedial Action Objectives: Fourteen

This alternative would consist of collecting and treating approximately one million gallons of standing water on site. Wash water, which was generated from the decontamination of contaminated surfaces and debris, would also be treated with the standing water. The treatment process would consist of precipitation, clarification, filtration and if necessary, ion exchange or ion replacement. The treated water would be recharged to the groundwater via injection wells or infiltration basins. Sediments and sludges generated during the treatment process would be treated and disposed of off site at a facility capable of accepting these materials. The treatment system would be designed to reduce metal concentrations to meet Federal and State discharge standards. Treatability studies would be required to define the design and operating criteria to meet the required standards for groundwater recharge. As part of this alternative, drains would be unplugged and cleaned, which in conjunction with the decontamination of buildings and paved surfaces, would prevent contaminated runoff from leaving the site in the future.

or through dermal contact is of potential concern for site workers and trespassers on the site.

Debris and Contaminated Surfaces

The process building walls, ceiling, floors, structural members, piping, and equipment are covered with dust. The results of wipe tests indicated high concentrations of lead, iron, cadmium, nickel and copper throughout the building. Concentrations of lead ranged from 0.88 to 552 micrograms/kg/quarter meter^2. Approximately 2500 cubic yards of contaminated debris consisting of lead dross and contaminated wooden pallets, baghouse bags, scrap metal and other materials are present throughout the site. Many of these materials were consolidated in temporarily protected areas as part of the most recent removal activity.

Releases of contaminants to air may occur from the migration of dust due to wind or activities at the site. The metal concentrations in the dust are significant and may pose a health risk, if inhaled by site workers or individuals downwind of the site. The potential also exists for site workers, trespassers and animals to be exposed to contaminated dust through dermal contact or ingestion.

Standing Water and Sediments

It is suspected that the drains are blocked in areas where standing water is ponded. It was estimated that approximately one million gallons of contaminated standing water (i.e., accumulated rainwater) are present at the site. This water was tested and found to have high concentrations of lead and other metals. Lead and cadmium concentrations were detected as high as 5,500 ppb and 560 ppb, respectively. The contamination is due, in part, to airborne particulates, and rain that has contacted the slag and lead oxide piles and other waste materials. In addition, approximately 200 cubic yards of sediments were estimated to have accumulated in the standing water.

Given site conditions, accidental ingestion and dermal contact are potentially the most likely on-site exposure pathways. The potential receptors would likely be site workers and area trespassers.

Off-site contaminant migration is potentially a significant exposure pathway from the NL site. During heavy rainfall, the standing water eventually overflows the site in the area of the West Stream. Concentrations of lead in the stream were measured as high as 206 ppb in surface water samples and 26,800 ppm in stream sediment samples taken in 1990. The lead concentrations in the stream exceed the EPA recommended criterion of 1.3 ppb for protection of aquatic life based on chronic toxicity.

In summary, current on- and off-site exposures resulting from hazardous materials present in the slag and lead oxide piles, contaminated surfaces and debris and standing water pose an imminent and substantial threat to public health and the environment. The proposed remedy will address these source areas on an expedited basis while the site-wide RI/FS continues to address the full nature and extent of contaminant migration from the site.

SUMMARY OF ALTERNATIVES

The FFS presents remedial alternatives to address three areas of hazardous surface contamination at the site: slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments. A wide range of technologies were considered to address the remedial objectives for each of these areas. These technologies were screened on the basis of effectiveness, implementability and costs. Those that were not eliminated from consideration during screening were assembled into the remedial alternatives presented below. The term "Months to Achieve Remedial Action Objectives" refers to the amount of time it would take to design, construct and complete the action. "N/A" implies that the "Months to Achieve Remedial Action Objectives" is not applicable for the this alternative.

Slag and Lead Oxide Piles

Alternative SP-1: No Action

Capital Cost:	$0
Annual O&M Costs:	$25,000
Present Worth Cost:	$439,000

Months to Achieve Remedial Action Objectives: N/A

Superfund regulations require that a No Action alternative be evaluated at every site to establish a baseline for comparison. The No Action alternative for the slag and lead oxide piles would include annual sampling and analysis of groundwater, surface waters and soils on and around the site to monitor the migration of contaminants. In addition, assessments would be performed every five years to determine the need for further actions.

Alternative SP-3: Off-Site Flame Reactor

Capital Cost:	$4,215,100
Annual O&M Costs:	$0
Present Worth Cost:	$4,215,100

Months to Achieve Remedial Action Objectives: Eighteen

This alternative would include removing and treating the slag and lead oxide off site in a flame reactor. This innovative technology would involve subjecting the wastes to very hot gas which reacts rapidly to produce a nonhazardous slag and a recyclable metal-enriched oxide. The volume of material would be reduced 10 to 20 percent. The slag could possibly be recycled as fill material or road aggregate and the metal-enriched oxide could be recycled by a secondary smelting facility, although at this time, no markets have been identified for these materials.

Alternative SP-4: On-Site Hydro-Metallurgical Leaching/ On-Site Disposal

Capital Cost:	$2,980,400
Annual O&M Costs:	$17,000
Present Worth Cost:	$3,269,500

Months to Achieve Remedial Action Objectives: Sixteen

This alternative would treat the existing waste by a hydro-metallurgical leaching process on site. Bench-scale testing would be required to define design criteria. The process, which is widely used in the metallurgical industry, selectively dissolves lead and other heavy metals present in the waste materials. The leaching step would be followed by filtration, residue collection, and precipitation. The precipitate is a

In 1986, NL signed a consent order with EPA, whereby NL assumed responsibility for conducting a Remedial Investigation and Feasibility Study (RI/FS) for the site with EPA oversight. Versions of the RI report were submitted to EPA in April and October 1990, and April 1991.

SCOPE AND ROLE OF THE OPERABLE UNIT

Recognizing the size and complexity of the site, EPA is addressing its remediation in phases, or operable units. This Proposed Plan addresses the remediation of several areas of hazardous surface contamination which EPA has designated as Operable Unit Two. These areas, which include slag and lead oxide piles, contaminated surfaces and debris, and contaminated standing water, were found to be significant and continual sources of contaminant migration from the site. As a result, EPA decided to address these areas on an expedited basis that would be consistent with the long-term remedy for the site. To achieve this objective, EPA conducted a FFS that identified and evaluated remedial alternatives for an Early Remedial Action which would continue the site-stabilization and remediation efforts which were initiated under a Removal Action. The Early Remedial Action will prevent further releases of contaminants from areas of hazardous surface contamination and can be implemented while the site-wide RI/FS proceeds.

Removal Action Activities

EPA conducted a multi-phased Removal Action at the site to address several conditions that presented a risk to public health and the environment. EPA conducted Phase I of the Removal Action in March and April 1983 which consisted of construction of a chain-link fence to enclose the former smelting plant and spraying or encapsulation of the on-site slag piles. Encapsulation of the piles provided temporary protection from wind and rain erosion and contaminant migration.

In November 1989, EPA began Phase Two of the Removal Action. This phase consisted of additional encapsulation of the slag piles, securing the entrances of the contaminated buildings, and removal of over 40,000 pounds of the most toxic and reactive materials.

During March of 1991, EPA performed Phase III of its removal activities at the site when damages to the perimeter fence were repaired and a new entrance gate was installed. In addition, approximately 2,200 empty, rusted and deteriorated 55-gallon steel drums were removed from the site. All on-site containers, stored in open areas and containing materials threatening release, were emptied and staged under an existing covered area at the rear of the facility. Sand/gravel berms were installed around these materials to deter the release of hazardous substances from this area. Finally, forty-four 55-gallon drums containing copper wire and cable were removed from the facility and were shipped to EPA's facility in Edison, New Jersey. Theft of this material has been the primary target of trespassers at the site.

Operable Unit One

A site-wide RI/FS, which EPA has designated as Operable Unit One, is currently being performed for NL by

O'Brien & Gere Engineers, Inc. This RI is a comprehensive study designed to determine the nature and extent of contamination on the site and areas adjacent to the site in various environmental media such as air, soils, groundwater, surface water and stream sediments. The FS will identify and evaluate remedial action alternatives to address contaminant sources and eliminate potential long-term health risks.

SUMMARY OF AREAS OF CONCERN AND SITE RISKS

EPA conducted a baseline risk assessment to evaluate the potential risks associated with conditions at the site. The baseline risk assessment qualitatively addressed risks which could result from contamination at the site, if no remedial action were taken.

Numerous contamination sources of hazardous wastes were identified at the site during previous investigations conducted by EPA. High concentrations of lead, cadmium, nickel and other metals have been detected on site in the slag, standing water and dust. Lead exposure causes noncarcinogenic effects on the central nervous system. In addition, lead is considered a probable human carcinogen. Exposure to cadmium and nickel has been associated with noncarcinogenic effects via ingestion. Cadmium is a probable human carcinogen by inhalation based on evidence from human and animal studies. Nickel has an "A" classification, denoting a human carcinogen, and is carcinogenic by inhalation.

The exposure assessment addressed three exposure media - the slag piles, dust and standing water. A brief description of these areas follows. Potentially exposed populations, fate and transport mechanisms and exposure routes were identified for each.

Slag and Lead Oxide Piles

Four slag piles totaling approximately 9,800 cubic yards are stored on site in open, deteriorating bins and on paved ground surfaces. In addition, approximately 200 cubic yards of lead oxide and similar materials are stored in enclosed areas. The slag materials were sprayed with an encapsulant to mitigate releases of hazardous constituents and contaminant migration which would occur from wind and rain erosion.

High concentrations of metals were detected in the slag and lead oxide piles. Concentrations of lead detected were as high as 130,000 mg/kg and 480,000 mg/kg in the slag and lead oxide piles, respectively. These concentrations exceeded the lead cleanup range of 500 to 1000 ppm listed in EPA's "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites." In addition, results of the Toxicity Characteristic Leachability Procedure (TCLP) indicate that the majority of piles tested are hazardous based on leachability of lead and/or cadmium.

Based on the level of contamination detected in the slag and lead oxide piles, a qualitative risk assessment indicates that the potential for inhalation of contaminated dust is considered significant for on-site workers and nearby receptors. Runoff via rain erosion is a mechanism for potential release of contaminants into the environment. In addition, exposure via accidental ingestion, inhalation on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified herein.

DATES TO REMEMBER

July 17, 1991-August 16, 1991
Public comment period for Operable Unit Two Preferred Remedy

Tuesday, August 6, 1991
7:00pm-9:00pm
Public Meeting at:

Oldmans Middle School
Freed Road
Pedricktown, New Jersey 08067

EPA solicits input from the community on the cleanup methods proposed at each Superfund site. EPA has set a public comment period from July 17, 1991 through August 16, 1991 to encourage public participation in the selection process. The comment period includes a public meeting at which EPA will discuss the FFS and Proposed Plan, answer questions and accept both oral and written comments.

The public meeting for the site is scheduled from 7:00 pm until 9:00 pm, on Tuesday, August 6, 1991, and will be held at the Oldmans Middle School, which is located on Freed Road in Pedricktown, New Jersey.

Comments on the Proposed Plan will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision. The Record of Decision is the document that presents EPA's final selection for response actions. Written comments on this Proposed Plan should be sent by close of business, August 16, 1991, to:

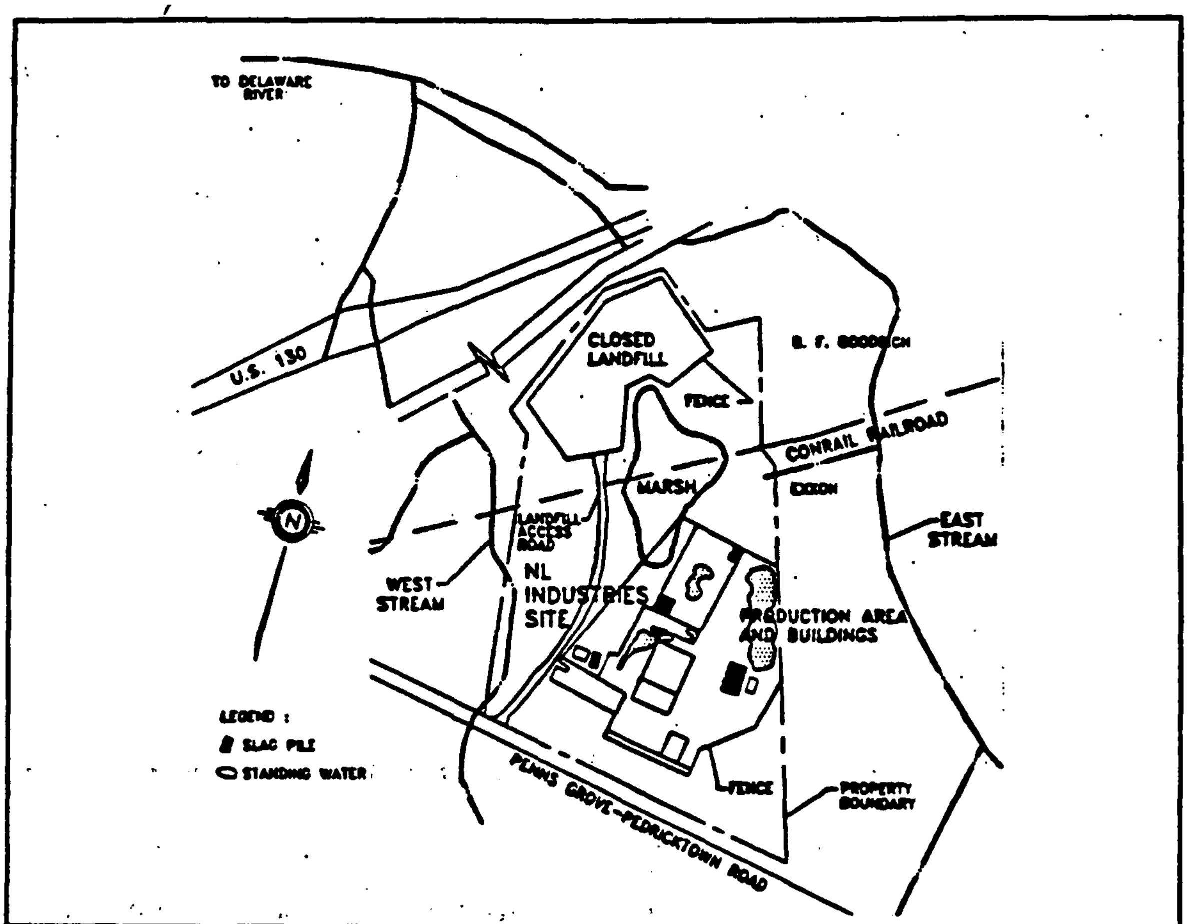
Michael Gilbert, Project Manager
U.S. Environmental Protection Agency
Emergency & Remedial Response Division
26 Federal Plaza, Room 720
New York, New York 10278

SITE BACKGROUND

The NL site is an abandoned, secondary lead smelting facility, situated on 44 acres of land on Pennsgrove-Pedricktown Road, in Pedricktown, Salem County, New Jersey. The site is bisected by a railroad, with approximately 16 acres north of the tracks which includes a closed 5.6-acre landfill. The southern 28 acres contain the industrial area and landfill access road (refer to site location map). NL maintains the landfill area and operates the landfill's leachate collection system.

The West and East Streams, parts of which are intermittent tributaries of the Delaware River, border and receive surface runoff from the site. The nearest home is less than 1000 feet from the site and B.F. Goodrich and the Tomah Division of Exxon are active neighboring industrial facilities.

In 1972, the facility began the operation of recycling lead from spent automotive batteries. The batteries were drained of sulfuric acid, crushed and then processed for lead recovery at the smelting facility. The plastic and rubber waste materials resulting from the battery-crushing operation were buried in the on-site landfill, along with slag from the smelting process.



NL Industries, Inc. Site Location Map (Not Drawn to Scale)

Between 1973 and 1980, NJDEP cited NL with 46 violations of the State air and water regulations. Water pollution violations were directed toward the battery storage area and the on-site landfill. NJDEP conducted an air-monitoring program in 1980 that detected airborne quantities of lead, cadmium, antimony and ferrous sulfate produced by the smelting process, at levels exceeding the facility's operating permits.

NL ceased smelting operations in May 1982. In October 1982, NL entered into an Administrative Consent Order (ACO) with NJDEP to conduct a remedial program to address the site soils, paved areas, surface water runoff, landfill and groundwater. In December 1982, the site was placed on the National Priorities List.

In February 1983, the plant was sold to National Smelting of New Jersey (NSNJ) and smelting operations recommenced. NSNJ entered into an amended ACO with NJDEP, National Smelting and Refining Company, Inc., which was NSNJ's parent company, and NL. The amended ACO clarified the environmental responsibilities of NSNJ and NL. NSNJ ceased operation in January 1984, and filed for bankruptcy in March 1984.

Appendix A

Proposed Plan

Public Notice

Public Meeting Attendance Sheet

Notice of Public Comment Extension

NL Industries, Inc. Site

Pedricktown, New Jersey

EPA
Region 2

July 1991

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred options for addressing several areas of hazardous surface contamination at the NL Industries, Inc. (NL) site. In addition, the Proposed Plan includes summaries of other alternatives evaluated for this Early Remedial Action, designated as Operable Unit Two for the site. This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for site activities, and The New Jersey Department of Environmental Protection (NJDEP), the support agency for this project. EPA, in consultation with NJDEP, will select a remedy for the site only after the public comment period has ended and the information submitted during this time has been reviewed and considered.

THE COMMUNITY'S ROLE IN THE SELECTION PROCESS

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986. This Proposed Plan summarizes information that can be found in greater detail in the Focused Feasibility Study (FFS) and other documents contained in the administrative record for this site. EPA encourages the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted to date. The administrative record file contains the information upon which the selection of the response action will be based. The file is available at the following locations:

Penns Grove Public Library
South Broad Street
Penns Grove, New Jersey 08069
(609) 299-9255

Hours:M,W:	10:00am-1:00pm 3:00pm-8:00pm
Th,F:	10:00am-1:00pm 3:00pm-6:00pm
Sa:	10:00am-1:00pm

and

U.S. Environmental Protection Agency
Emergency & Remedial Response Division
Division File Room
26 Federal Plaza, 29th Floor
New York, New York 10278

Hours:M-F: 9:00am-5:00pm

EPA, in consultation with NJDEP, may modify the preferred alternative or select another response action presented in this Proposed Plan based cost-effective recycling is available, would be recycled. EPA also believes that recycling may be cost competitive for some on-site materials, since some facilities with the capability of recycling these materials are also PRPs for the site.

EXIDE: "Has adequate consideration been given to possible recycling of dust, lead dross, scrap metal, and other materials which may be generated from these [decontamination] activities?"

EPA RESPONSE: As mentioned previously, any untreated or treated waste material for which protective, cost-effective recycling is available would be recycled. Also, see EPA's previous discussion and responses concerning recycling.

EXIDE: "Alternative CS-2 notes that 'debris that could not be decontaminated such as contaminated baghouse bags, along with collected dust, would be transported to an appropriate off-site RCRA hazardous waste treatment and disposal facility.'

Exide Corporation believes that baghouse dust, as well as baghouse bags from a secondary lead smelter, are classified as K069 listed wastes pursuant to EPA regulations under the Resource Conservation and Recovery Act. The EPA land disposal restrictions prohibit the disposal of these types of materials and mandate thermal recovery (i.e., secondary lead smelting). EPA's proposed plan with respect to the disposal of baghouse dusts and baghouse bags, therefore, is a violation of RCRA."

EPA RESPONSE: The commentor is correct in stating that baghouse dusts and baghouse bags are listed waste (K069). These materials would be treated in accordance with RCRA Land Disposal Restrictions and treatment standards and disposed of accordingly at an appropriate RCRA-permitted facility, using Best Demonstrated Available Technology (BDAT). BDAT for K069 waste is thermal recovery of lead in secondary lead smelters.

JOHNSON CONTROLS: "U.S. EPA apparently agrees that recycling is an appropriate remedy, but elected stabilization and on-site disposal in its Proposed Plan because it could not find a recycling vendor. However, conversations with recycles indicate that U.S. EPA may be incorrect in dispensing with the recycling option. Also, U.S. EPA did not explore the possibility that recyclers could be paid for their efforts at a rate considerably less than that for stabilization and disposal. Accordingly, we request that U.S. EPA identify alternate remedies (recycling and the remedy set forth in the Proposed Plan) in its Record of Decision so that whoever undertakes the remedial action can choose between them during

the remedial design phase according to relative cost-effectiveness."

EPA RESPONSE: Refer to EPA's previous discussion and responses concerning recycling.

F. SEQUENCE OF CONDUCTING REMEDIAL ACTIVITIES

JOHNSON CONTROLS: "We are concerned with sequencing of the remedy components. Sequencing should assure that any further stormwater which falls at the site remains clean. The slag and oxide should be addressed first so that handling of these materials does not result in any hazardous substances which may be present at the site migrating to already cleaned areas. The buildings should be addressed next, with water treatment beginning for each building as any wash water is generated and in turn for the ponded water around each building, with immediate cleaning of the underlying areas so future stormwater remains clean."

EPA RESPONSE: EPA, as stated in the Proposed Plan, agrees with the sequence of the first two components. Dust suppression would be provided during remediation of slag and lead oxide materials. Decontamination of the building interior concurrently with slag and lead oxide remediation would not result in migration of contamination to cleaned areas. However, ponded water areas are interconnected and pumping of water from one area would draw water from other areas. Therefore, EPA believes it would be more prudent to collect all water and treat it when surface decontamination is complete. EPA will confirm the appropriate sequence for conducting the selected remedial activities during design.

the slag. As a result, EPA did not conduct a detailed evaluation of potential options involving recycling, and proceeded with the evaluation of more viable and cost-effective alternatives for the slag material.

Following issuance of the Proposed Plan, however, EPA received comments from several companies indicating that they believed that recycling may be a viable and cost-effective alternative for many of the materials at the site. Two of these companies, which EPA has named as PRPs, indicated that they are permitted RCRA facilities and have offered to discuss the feasibility of treating materials from the NL site at their facilities. One of them, as discussed below, submitted a preliminary proposal to treat the slag material.

In light of the comments that EPA has received regarding recycling of site materials, EPA is willing to discuss such options further during design and implementation of the selected remedy. As recycling would result in the recovery of contaminant resources in the waste material, and in the permanent removal of materials from the site, EPA would allow materials to be recycled, provided that it could be done in a protective and cost-effective manner, and could be accomplished in approximately the same time frame as the selected remedy.

EXIDE: "Page 1-5 of the EPA Focused Feasibility Study indicates that EPA made several inquiries to parties that may have been interested in removing the slag for recycling and that '...no positive responses were received, primarily due to the low lead content of the slag and lead oxide piles.' in Exide Corporation's case, this is not an accurate statement."

EPA RESPONSE: In a letter to Exide Corp, dated January 24, 1991, and contained in the Administrative Record, EPA sent an analysis and a description of the slag material. This followed a preliminary slag analysis sent to Exide Corp on September 24, 1990, and a conversation with Mr. Jeff Leed of Exide Corp, on January 23, 1991. As stated in the FFS, no positive responses were received which indicated a willingness to remove the slag for recycling, prior to the completion of the FFS and issuance of the Proposed Plan.

MASTER METALS: "Master Metals Inc. would like to respond to the summary of Remedial Alternatives for the slag and lead oxide material. As noted in previous correspondence, Master Metals Inc. is an approved and insured TSD facility for D008 and K069. We have several years experience in treating these waste streams and the characteristics of these two streams are identical to material we are currently processing. We have examined the characteristics and are capable of handling the material at our facility.

I would like to briefly address the key components as they compare to alternative SP-1 SP-3 SP-4 SP-5. Criteria 1, 2, 4 and 5 would be stated as in your executive summary. In criteria 3, Master Metals would have a definite advantage as this is proven technology and the operation is reliable. All the factors mentioned under 6 implementability for Master Metals facility are positive. The factors are as follows:

a) proven technology
b) no monitoring would be required after remediation
c) Lacy's Express has agreed to provide transportation. They are experienced and licensed in these matters.
d) history of proven experience
e) can complete remediation within 11 months.

The cost we propose including freight is $2,690.000. This cost is 10% higher than your recommendation, however the material will no longer remain on site.

We would also be interested in materials from the building demolition and sand blasting or sediments."

EPA RESPONSE: As discussed above, EPA would be willing to discuss this or other recycling proposals, if it could be demonstrated that the work would be implemented in a protective and cost-effective manner and in a comparable period of time as the preferred remedy.

EXIDE: "The lead concentration in some of the on-site materials are sufficiently high to allow for consideration to be given to the recycling of some of these materials at secondary lead smelters."

EPA RESPONSE: Refer to EPA's response to the previous comment.

EXIDE: "Recycling through a secondary lead smelter has not been fully considered... because of the lead content of these materials, some of them may be recyclable and further consideration of this option is warranted."

EPA RESPONSE: As stated above and on page 1-5 of the FFS, EPA has made several inquiries to parties that may have been interested in removing the slag for recycling. No positive responses were received, primarily due to the low lead content of the slag and lead oxide piles. As mentioned previously, any untreated or treated waste material for which protective, believes that sufficient area exists for deposition of these materials. EPA agrees that placement of treated material in this area (existing slag pile A, truck cut area and pond area; see Figure 1-2 of the FFS) may involve dismantling some structures such as the dilapidated slag bins. Actual space availability and disposal area would be determined during the design phase. On-site disposal would limit the use of paved areas but not eliminate future use of the buildings. The basement may be considered for treated material disposal, but the space is limited and it would preclude future use of the basement.

JOHNSON CONTROLS: "The Proposed Plan requires the placement of stabilized materials in a RCRA Subtitle D landfill. We are concerned about the consistency of this requirement with any remedy prescribed for Operable Unit I at a later date. If other materials at the site must be placed in a landfill, it may be uneconomical to design a separate landfill at a later time. Consequently, we request that U.S. EPA include in its Record of Decision provisions which allow the party conducting the remedial action the option of storing the stabilised material in the interim or designing a landfill which will accommodate all site materials. Since the Record of Decision on Operable Unit I is expected next year, well before the remedial design for Operable Unit II is completed, allowing either interim storage or proper sizing of the landfill as alternatives will help to assure that the remedy is cost-effective without creating any long-term problems.

EPA RESPONSE: An important point requires clarification. The Proposed Plan does not specify that the stabilized materials must be placed in a RCRA Subtitle D facility. For conservative cost-estimating purposes, it was assumed that Subtitle D requirements would be met. However, the requirement for the placement of stabilized material is that it be done in a protective manner. EPA believes that depending on the remedial activities that will be required by the Operable Unit 1 action, consolidation of the stabilized material with other materials in the future may be possible.

PUBLIC COMMENT: "[A]s much of the lead wastes as possible should be removed from the site. This removal would not only include the slag piles, but also all buildings, unsalvageable process equipment or any other debris or structures which would serve as a reminder of NL Industries and National Smelting. Since the site lies in an outcrop and recharge zone of the Raritan-Magothy aquifer (an important source of drinking water for southern New Jersey) it would be prudent to further reduce the potential for groundwater contamination by removing the wastes rather than stabilising for disposal on site."

EPA RESPONSE: Removal and off-site disposal of stabilized/ solidified slag and lead oxide materials and decontaminated buildings and equipment from the site would not achieve any significant additional protection, while incurring substantial additional cost for transportation and disposal. Stabilized material would pass the TCLP test and would be placed on site in a protective manner. A long-term monitoring program would be instituted to monitor potential migration of contaminants from treated material and ensure protectiveness of the remedy. Similarly, once the buildings and equipment have been decontaminated, they would no longer pose a threat to public health and the environment. Demolition of structurally sound buildings and disposition of equipment which have been decontaminated is beyond the remedial response objectives and responsibilities under Superfund.

PUBLIC COMMENT: The cleanup should be expanded to include contaminated stream sediments or any other highly contaminated soils on adjacent properties.

EPA RESPONSE: Cleanup of contaminated stream sediments and soils will be addressed as part of the Operable Unit 1 remedy.

E. RECYCLING

Since a number of comments received on the proposed remedy concerned the recycling of site materials, EPA provides the following to clarify its position on this issue.

It has always been EPA's intention to allow for recycling and recovery for reuse of as many of the site materials as possible. This is evidenced by the statement made in the Proposed Plan that as part of the remediation which would address debris and contaminated surfaces, materials would be recycled where possible.

While conducting the FFS, EPA investigated recycling for off-site treatment, disposal and recovery of waste materials from the site. Specifically, EPA was interested in identifying the recycling potential of the slag piles, which at an estimated volume of 9800 cy, represent the major portion of waste being addressed.

Based upon information obtained during EPA's preliminary evaluation of recycling options, due to the relatively low lead content (approximately 12 percent) of the slag material, no markets were identified which indicated an interest in utilizing this material. Consequently, EPA concluded that recycling was not a viable or cost-effective alternative for and surface water contamination, since it overflows during precipitation events into surface streams, and also infiltrates into groundwater. Therefore, expedited removal of contaminated standing water and cleaning of the drains, is necessary to eliminate it as a continuing source of contaminant exposure and migration.

JOHNSON CONTROLS: "With respect to the ponded stormwater, we have obtained estimates which indicate that one million gallons of water could be treated on-site in a rental unit for less than $100,000. Also, while off-site disposal costs may be considerably less than EPA estimated, they are expected to be significantly greater than the rental unit cost. EPA determined that both remedies satisfy NCP criteria, but hypothesized that off-site disposal would be cheaper (a questionable conclusion). We propose that EPA permit whoever performs the remedial action to choose the more cost-effective alternative."

EPA RESPONSE: Injection of standing water into the aquifer would require on-site treatment to achieve the EPA action level for lead of 15 micrograms per liter (ug/l). For a surface water discharge, the treated water would need to meet a site-specific discharge criterion estimated to be 1.3 ug/l, which is based on EPA's recommended criterion for freshwater aquatic life protection for chronic toxicity. EPA believes that a number of unit processes in series would be required to achieve these levels. An estimate of $100,000 seems to be unrealistically low to achieve these stringent discharge requirements. If, however, it could be demonstrated that on-site discharge could be conducted in accordance with the appropriate discharge criteria, and would be less expensive than off-site treatment and disposal, EPA would permit the more cost-effective alternative.

JOHNSON CONTROLS: "[W]e request that EPA permit whoever performs the remedial action to use ponded stormwater in the stabilization process. There is no point in using clean water. Furthermore, in the event on-site treatment of the ponded stormwater is utilized, we request that EPA permit the use of treated water for building decontamination and cleaning to lessen the amount of treated water which must be discharged."

EPA RESPONSE: It is mentioned on page 5-21 of the FFS that standing water on site may be used as a source of water for the stabilization/solidification process. In addition, if it can be demonstrated that ponded water can be treated to levels determined by EPA to be acceptable for decontamination, EPA would allow using such water for this purpose. EPA, however, does not believe that it would be cost-effective to do so.

EXIDE: "Have options for treatment of water been considered with possible discharge into the sanitary sewer in lieu of groundwater recharge?....Have potential options for recycling of contaminated sludges and sediments been considered?"

EPA RESPONSE: Yes. Based on inquiries with town officials, there are no sewer lines or sewage treatment plant (POTW) in Pedricktown. The nearest POTW is in Carney's Point, which is approximately five miles from the NL site. In addition, this facility indicated that it would not accept water originating from a Superfund site.

EPA has indicated on page 4-45 of the FFS that any untreated or treated material for which protective, cost-effective recycling is available would be recycled.

D. ON-SITE PLACEMENT

ENVIRON: "EPA should provide an analysis of appropriate sites for on-site disposal of the material, especially in the context of future use scenarios for the site. Examination of the attached Figure W-1 of the Remedial Investigation Report Volume IV suggests that wetlands and property boundaries preclude the use of unpaved areas of the property for the construction of the on-site landfill.... Consideration should be given to the feasibility of placement of the stabilised material in the paved area at the site. For example, the basement of the refining building could contain approximately 1,500 cy of stabilised material. Placement of the remaining stabilized material at the north end of the paved manufacturing area (86,000 square feet) would require further analysis, and would likely involve dismantlement of all structures north of the refining building."

EPA RESPONSE: EPA has considered a potential site for the on-site disposal of stabilized/solidified material in the context of future use scenarios for the site. Treated waste would potentially be disposed on paved areas which include sufficient space for deposition of such materials. For conservative cost-estimating purposes, it was assumed that disposal would meet RCRA Subtitle D requirements. Figure 2 of the Remedial Investigation Report - Volume I and Figure W-1 of Remedial Investigation Report - Volume IV were used to determine space availability for FFS purposes. The total area required for the on-site deposition of the treated material was estimated to be between 40,000 and 50,000 square feet. As the open paved area in the northern portion of the industrial area was estimated to be approximately 63,000 square feet, EPA

ENVIRON: "[I]t is not evident that any dust in the buildings, which has remained seven years after the cessation of operations, would be suspended in air and present a health threat via inhalation. The small layer of dust that may still adhere to the surfaces of the buildings presents an extremely limited source for wind erosion, and would not be readily susceptible to suspension. EPA has not provided any data to support the assumption that the inhalation pathway presents a potential health risk."

EPA RESPONSE: Chemical analyses for wipe samples and other waste areas presented in Table 3-1 of the FFS indicate high metal concentrations (e.g., lead and cadmium) on contaminated surfaces and debris. Although currently not in suspension, the dust represents a potential source of air contamination within and outside of the buildings and a threat to human health and the environment due to potential exposure to, and migration of, these contaminants. In addition, decontamination of the buildings is consistent with the overall site remedy.

ENVIRON: "It should be noted that the preferred remedy does not provide any guidance on the acceptable cleanup level for the building surfaces. The cleanup objective should be established in consideration of future use scenarios. While decontamination and potential reuse of buildings may be feasible for the laboratory/office complex, the warehouse, and potentially the refining buildings, clearly the decaying operations, buffer storage and kilns have little value to non-smelting operations. NL asserts that demolition of some or of all the structures should be considered as a remedial option by EPA if it is a safer and/or more cost-effective remedial alternative. In addition, cleanup should take into account whether or not RCRA standards for off-site disposal apply."

EPA RESPONSE: Although the preferred remedy does not provide specific cleanup levels, the objective of the expedited response action is to remove known sources of contamination which present potential risks to human health, in terms of inhalation and direct contact. Health-based cleanup levels for building surfaces will determined during remedial design.

Demolition and disposal of some of the structures such as large buildings would involve additional cost and be no more protective of human health and the environment. For some of the structures, EPA agrees that if it were safer and/or more cost-effective, remedial activities would include demolition. However, decontamination would still be required, because demolition without decontamination could involve releases of contaminated dust and result in risks to the neighboring community and the environment. In addition, cleanup would be conducted in accordance with RCRA regulations. Disposal of contaminated demolition debris would require treatment and disposal at a RCRA facility and be subject to Land Disposal Restrictions due to the potential presence of lead dust, which is a listed waste (K069). Waste materials resulting from decontamination would be treated in accordance with RCRA Land Disposal Restrictions and disposed at an appropriate RCRA-permitted facility.

EXIDE: "Has consideration been given to the potential future need to reclean the facility if subsequent remedial activities at the site result in recontamination of surfaces?"

EPA RESPONSE: Subsequent remedial actions will be conducted utilizing standard dust control measures at a minimum, to control fugitive dust emissions, and therefore minimize recontamination of clean surfaces.

C. STANDING WATER AND SEDIMENTS

ENVIRON: "EPA's decision to remove the standing water from the property for off-site treatment is premature in that it neglects other contaminated water present at the site that will be addressed in the FS for Operable Unit 1. Operable Unit 1's FS will be completed by December 1991, prior to the completion time for implementation of this alternative. Therefore, it is logical that EPA consider the appropriateness of treating this waste stream with other Operable Unit 1 waste streams (e.g., contaminated ground water) in a common remedy."

EPA RESPONSE: The Draft Feasibility Study for Operable Unit 1 is scheduled to be completed in March 1992, and it is expected to take several additional months until the document is finalized and EPA has selected a remedy. Although a remedy may be selected by mid to late 1992 for Operable Unit 1, implementation of the remedy may not begin for another eighteen months or so. Recognizing this, along with the size and complexity of the site, EPA is addressing site remediation in phases, or operable units.

EPA has designated that Operable Unit 2, which is the subject of this document, would address areas of hazardous surface contamination within the paved area of the site. EPA has determined that these areas will be remediated on an expedited basis which would continue the activities begun under the Removal Action and be consistent with the total site remedy. Contaminated standing water is one of the continuing sources of off-site contaminant migration contributing to groundwater in Table 3-3, TCLP results indicate that the majority of piles tested qualify as hazardous waste pursuant to RCRA, based on leachability of lead and/or cadmium.

EXIDE: **"The EPA statements and Alternative SP-5 which indicate that 'bench-scale tests would be required' to evaluate this option, suggest that EPA may not have considered the potential need to process the slag prior to stabilization, to control dust from this operation, and/or to properly collect and treat wastewater which may be generated. In addition, the agency appears to have selected this option without bench-scale tests and thus with little, if any, knowledge about the amount of solidification agents which would be needed to stabilize these materials. Given the potential uncertainties associated with the feasibility and costs associated with this option, it is suggested that bench-scale tests be conducted to evaluate this option against the potential recycling alternative. Indeed, it may also be necessary to perform independent evaluations on the slag and lead oxide as the results of the evaluations may be different."**

EPA RESPONSE: As stated on page 5-25 of the FFS and in the Record of Decision, bench-scale tests will be required for stabilization/solidification to select the proper type and quantity of stabilizing agents, feed material and water. These tests would be performed during Remedial Design. Literature and vendor information is sufficient to indicate that the widely used and proven stabilization/solidification technology would achieve remedial objectives for metals-contaminated materials for the approximate cost of the remedial action, which was estimated at $2.3 million.

B. DEBRIS AND CONTAMINATED SURFACES

ENVIRON: **"EPA has proposed decontamination of contaminated surfaces and debris with off-site treatment and disposal as part of Operable Unit (OU) Two. At the threshold, we note that building contamination has also been considered in OU One, and recommend that EPA clarify which OU will address decontamination. The contaminated debris consists of lead dross, wooden pallets, baghouse bags, scrap metal and other materials present throughout the site. It is not clear that the debris and contaminated surfaces present similar risks, that similar cleanup criteria should be applied, or that similar remedial alternatives are available. Further the need for expedited cleanup of wooden pallets, scrap metal and other debris is unclear. NL Industries, therefore, recommends that the debris and building surfaces be evaluated separately."**

EPA RESPONSE: EPA has decided that decontamination of contaminated surfaces and debris with off-site treatment and disposal will be conducted as part of Operable Unit 2. Lead dross, a lead-bearing byproduct of the smelting process, has been considered as similar to lead oxide material and would be treated with lead oxide material, or recycled if possible and cost-effective. Other contaminated debris such as wooden pallets, bag house bags, scrap metal, plastic, rubber and other materials present similar risks as contaminated surfaces (buildings and equipment) because these materials are covered with dust similar to contaminated surfaces. The metal concentrations in the dust are significant and may pose a health risk, if inhaled by potential on-site workers or individuals downwind of the site. This dust is subject to migration by wind, and possibly rain, due to the deteriorating roof condition. Decontamination of contaminated surfaces is consistent with the overall site remedy and eliminates the need to maintain the buildings' integrity until some future date, while at the same time, permanently eliminates these contaminated areas as sources of contaminant exposure or migration.

EPA agrees that all materials may not be amenable to decontamination. Any materials which could be cost-effectively recycled would be recycled. Debris that could not be decontaminated, such as contaminated bag house bags, would be transported to an appropriate off-site, RCRA permitted treatment and/or disposal facility.

ENVIRON: "The primary justification for including the buildings in an expedited remedial action, appears to be exposures from inhalation, ingestion and dermal contact with dust. It is recognized in the FFS (p. 1-4 and 1-5) that limited access to the site, the securing of entrances to the contaminated buildings, and removal of valuable material from the site would effectively deter trespassers from the site and would reduce the dermal and ingestion exposure. The potential risk from these pathways were thus considered to be much lower compared to inhalation exposure (FFS p.1-9)."

EPA RESPONSE: Although limiting access to the site, securing entrances to the contaminated buildings and removing valuable material from the site would deter trespassers, it will not completely eliminate curious trespassers, children or vandals from entering the site. These individuals would be subject to inhalation, dermal and ingestion risks to contaminants at the site, while possibly exposing others by bringing contaminants off-site on their shoes and clothing. Furthermore, because they do not address the problem on a permanent basis, EPA does not consider institutional controls such as fencing, when evaluating potential exposure pathways.

EPA RESPONSE: EPA has no legal authority or decision-making role relative to the fate of the on-site buildings once the site remediation has been completed, and therefore, does not plan to take further actions to address the buildings. Since the current owner of the site, National Smelting of New Jersey (NSNJ), is bankrupt and a trustee was appointed, any disposition of the site buildings and equipment must be done in accordance with applicable bankruptcy laws. EPA also notes that the trustee for NSNJ has been notified of NSNJ's liability as a PRP for the site.

IV. Summary of Comments from Other Interested Parties and EPA Responses

This section contains a summary of the questions and comments, which pertain to the selection of the remedy, received by EPA in writing during the public comment period. Copies of the original letters stating the comments may be found in Appendix B. Comments were received from one citizen and from representatives of some of the PRPs for the site. These PRPs are Exide Corp, AT&T, Allied-Signal, C&D Charter Power Systems, Gould Inc., Johnson Controls and Master Metals, Inc. In addition, questions and comments were received from ENVIRON, a technical consultant to NL Industries, Inc., a PRP for the site. Comments presented in this section are organized into the following categories:

A. Slag and Lead Oxide Piles

B. Debris and Contaminated Surfaces

C. Standing Water and Sediments

D. On-site Placement

E. Recycling

F. Sequence of Conducting Remedial Activities

A. SLAG AND LEAD OXIDE PILES

ENVIRON: "Table 1-2 from the FFS suggests approximately 9,800 cubic yards (cy) of slag and 200 cy of lead oxide in piles on the paved area. The 1988 inventory, presented as Table 1 in the Remedial Investigation, indicated approximately 7,500 cy of slag and other lead bearing materials in the manufacturing area. The EPA is using a value approximately 30% higher than the 1988 inventory."

EPA RESPONSE: A March 1991 inventory taken by EPA estimated approximately 9,800 cy of slag and 200 cy of lead oxide materials on the paved area. Both the 1988 and 1991 estimates represent approximations. EPA is relying on its own estimate for cost-estimating purposes. Although the actual quantity may vary somewhat from this estimate, it would not affect the selection of remedial alternative.

ENVIRON: "The EPA stated in Section 5.2.4.1 of the FFS that the stabilization process might result in a volume change of as much as 40%, which seems high for this type of material. The EPA estimates 14,000 cy of stabilized materials to be disposed in an on-site RCRA Subtitle D landfill."

EPA RESPONSE: Volume increase by the stabilization/solidification process depends on the material treated, reagents used and quantity of reagents added. Literature and vendor information range from a volume decrease to a 100 per cent volume increase. Most widely reported volume increases for metal-contaminated waste stabilization/solidification are from 30 to 50 per cent. For the purposes of the FFS, EPA used a value of 40 percent to provide a conservative estimate of the amount of stabilized material to be place on site in a protective manner. The actual volume increase will be determined by a treatability study.

ENVIRON: "The construction cost presented in the FFS and Proposed Plan apparently includes no cost for construction of an on-site landfill. The cost estimate presented as Table B-4 of the FFS provides a cost of $4.34/cy for disposal on-site. This value may pay for the transfer of material from the curing location to a disposal location, however, it does not cover the construction cost of a landfill on-site."

EPA RESPONSE: Cost estimates presented in Table B-4 of the FFS include the construction cost of an on-site RCRA Subtitle D landfill. EPA recognizes that although this cost ($4.34/cy) may be on the low end of the cost range, even if the cost were tripled, it would only increase the total estimated cost by $122,000, which would not affect the selection of the remedial alternative.

EXIDE: "Exide Corporation does not understand EPA's basis for comparing lead levels in slag to EPA's Interim Guidance on Establishing Soil Lead Clean-up Levels in residential soils at Superfund Sites."

EPA RESPONSE: Lead levels in slag and lead oxide materials were compared to EPA's Interim Guidance on establishing soil cleanup levels for lead to show the relative concentration of lead in these materials. As stated in the FFS on page 1-8 and

EPA RESPONSE: Arsenic was detected during FFS sampling and analysis activities and is a contaminant of concern at the NL site. EPA has identified lead and cadmium as primary contaminants at the site because the results of the Toxicity Characteristic Leaching Procedure (TCLP) conducted on samples of the slag and lead oxide piles, indicated that, of all the metals analyzed, these two leached from the piles at concentrations which exceeded the criteria which characterize the piles as hazardous. Remediation of lead and cadmium contamination at the site will also result in the remediation of other heavy-metal contamination.

COMMENT: A resident commented that EPA's public meeting presentation and associated documentation appeared to show levels of contamination which decreased abruptly beyond the site property line and sought clarification regarding this abrupt change.

EPA RESPONSE: The illustrations presented by EPA showed ranges of contaminant concentrations and depicted higher concentrations within the fenced industrial area and the site property boundary. Contaminant concentrations were found to decrease in areas removed from contaminant sources, including off-site areas. Extensive sampling has been conducted on and off the former NL property. The levels of contamination decrease significantly beyond the property boundary, and particularly, beyond the industrial area of the property.

COMMENT: A resident asked how EPA determined the range and scope of its FFS sampling activities.

EPA RESPONSE: EPA's Removal Action activities addressed the worst areas of hazardous surface contamination at the site. As a result of the information and data collected during these activities, EPA determined that certain areas of hazardous surface contamination could be addressed on an expedited basis through an Early Remedial Action, which would be consistent with the long-term, site-wide remedy. Sampling was done to provide information needed to choose a remedy for these areas of hazardous surface contamination, namely, the slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments.

COMMENT: A resident asked if EPA was proposing on-site or off-site disposal of the slag pile material.

EPA RESPONSE: Under EPA's Preferred Alternative for slag pile and lead oxide pile contamination (Alternative SP-5), the slag pile material will be solidified, stabilized and disposed on site in a manner which is protective of human health and the environment. As a temporary measure, the slag material may be encapsulated by a spraying technique to prevent releases of fugitive dusts and particulates, while the permanent remedial alternative is being implemented.

COMMENT: A resident asked why Alternative SP-3, the off-site flame reactor, was not selected as EPA's preferred alternative.

EPA RESPONSE: Treatment of contaminated material with a flame reactor is considered an innovative technology whose implementability on a commercial scale is not yet proven. The only flame reactor currently operating is in Pennsylvania, and is operating on a pilot scale. In addition, this technology was estimated to be more expensive to implement compared to the solidification/stabilization technology. Markets for the process byproducts associated with the flame reactor have not been identified, which may further increase its cost to implement. There are also some state permitting issues regarding flame reactor treatment which have yet to be resolved. These involve emissions permits and permitting to accept hazardous waste from out-of-state sources.

C. COMMUNITY ISSUES

COMMENT: A local official suggested that the NL Industries site be cleared of structures following completion of remedial actions, so that it would be suitable for some future use and consequently provide the community with needed tax revenue.

EPA RESPONSE: Under Superfund, EPA is authorized to spend money to remediate sites contaminated with hazardous materials. Once the buildings are decontaminated, EPA is not authorized to spend money solely for demolition purposes.

COMMENT: A resident asked if the site would remain unusable once the Operable Unit 2 remediation is completed.

EPA RESPONSE: The NL site will be suitable for certain uses following the remediation. However, some land use restrictions will be placed on the site to ensure that stabilized material is not disturbed, so that the remedial action continues to be protective of public health and the environment.

COMMENT: A resident asked what would become of the industrial area buildings after they have been decontaminated.

III. Summary of Public Comments and EPA Responses

This section contains a summary of verbal questions and comments which pertain to the selection of the remedy received from the community during the August 6, 1991 public meeting. Comments presented in this section are organized into the following categories.

A. Cleanup Funding and Schedule

B. Technical Concerns

C. Community Issues

A. CLEANUP FUNDING AND SCHEDULE

COMMENT: A resident asked who would pay for the cost of implementing the remedial alternative.

EPA RESPONSE: EPA has identified approximately fifty parties as potentially responsible for contamination at the NL Industries site. EPA has requested payment of $700,000 of past response cost from the PRPs. EPA will continue to pursue all liability and enforcement provisions available to it under the Superfund legislation to have past and future response actions funded by PRPs.

COMMENT: A resident asked how EPA expects to recover cleanup costs from those PRPs which have been delinquent in paying local property taxes and other taxes.

EPA RESPONSE: Most of the PRPs which have been identified for the NL site do not own the site property but have sent hazardous substances and/or hazardous wastes to the site. EPA believes that many of these PRPs are solvent entities with the financial ability to pay cleanup costs for which they are liable. As discussed in EPA's response to the preceding comment, EPA has the authority to request payment of past costs. If a PRP were to refuse to reimburse EPA voluntarily, EPA can also initiate legal proceedings for cost recovery.

COMMENT: A resident expressed concern that the estimated schedule for completing the remediation of the areas of hazardous surface contamination was too long.

EPA RESPONSE: The estimated time for implementing EPA's preferred alternatives for remediating the slag and lead oxide piles, surfaces and debris, and standing water is approximately three years. EPA believes that this is a realistic time frame for such work.

The time frame is based upon the following sequence of remedial activities. First, the slag and lead oxide piles would be treated. Concurrently, buildings, paved surfaces, equipment and debris would be decontaminated. Subsequently, the contaminated standing water and water used for decontamination of buildings, etc., would be collected and transported for off-site treatment and disposal. Finally, drains would be decontaminated and unplugged. Through this sequence, the sources of airborne contamination and contaminated runoff would be eliminated and water from future rain events would drain through these areas without transporting contamination off site.

COMMENT: A resident asked if bids had been solicited from area waste management companies regarding removal and disposal of contaminated on-site materials and suggested that this may be a more cost-effective way to perform the cleanup.

EPA RESPONSE: EPA's cost estimate for this off-site treatment and disposal alternative was included under Alternative SP-6 in Chapter 4 of the FFS. The cost of this alternative was estimated to be $6,159,100. Identification of specific contractors would occur during the Remedial Design phase. However, based upon experience and inquiries made during the FFS, EPA believes that the cost of off-site disposal is significantly more expensive, and no more protective, than the selected remedy.

COMMENT: A resident asked if National Lead (NL) and National Smelting of New Jersey (purchaser of the plant site in 1983) are both identified as PRPs for contamination at the site.

EPA RESPONSE: Both companies have been identified as PRPs for the site.

COMMENT: A resident asked for a listing of all the PRPs identified for the site.

EPA RESPONSE: A list of companies notified that they may be PRPs for the site is presented in Appendix C.

B. TECHNICAL CONCERNS

COMMENT: A resident asked if EPA had detected arsenic during sampling activities conducted as part of the FFS.

expressed by the public at the public meeting concerning the proposed remedy. Section IV presents a summary of written comments on the Proposed Plan and FFS. Each question or comment is followed by EPA's response. Written comments received during the public comment period are attached in the appendices described below. All comments expressed to EPA were considered in EPA's final decision for selecting the remedial alternatives for addressing contamination at the site.

Attached to the Responsiveness Summary are the following appendices:

- Appendix A - Proposed Plan and Public Comment
    - Attachment A.1 - Proposed Plan
NL Industries, Inc. Site
Pedricktown, New Jersey
July 1990
    - Attachment A.2 - Public Notice
    - Attachment A.3 - August 6, 1990 Public Meeting
Attendance Sheet
    - Attachment A.4 - Notice of Public Comment Period
Extension
- Appendix B - Written Comments on the Proposed Plan
and Focused Feasibility Study
- Appendix C - PRPs Who Were Sent a General Notice Letter

II. Background on Community Involvement and Concerns

Pedricktown residents first became aware of potential environmental and public health impacts associated with operations at the NL site in 1975, when the Salem County Department of Health sampled 15 private drinking-water wells in the site vicinity. One well was found to have elevated lead levels. Several months later, private homes along Benjamin Green Road west of the site were connected to the public water supply. Other early investigative activities performed to assess off-site impacts included an air monitoring program initiated by the New Jersey Department of Environmental Protection (NJDEP) which detected elevated levels of several airborne contaminants, including lead.

EPA's involvement with the NL Industries site began in December 1982 with the site's inclusion on the National Priorities List of Superfund sites. Since that time, EPA has implemented a community relations program in the site area designed to both inform the public of site activities and solicit input from the community regarding its site-related concerns and questions. These efforts have included disseminating printed public information materials and conducting public meetings and information sessions to coincide with technical milestones at the site. Recently, on July 17, 1991, EPA conducted community interviews with local officials and residents to identify community issues and concerns regarding the site. EPA received additional input from the community at the August 6, 1991 public meeting, during which EPA provided an update of the Superfund activities at the site and presented the Proposed Plan.

Based on comments received during the July 17 community interviews and August 6 public meeting, the three major issues or concerns expressed by local residents and officials were:

- Desire to have remedial activities proceed and be completed as soon as possible
- After decontamination, demolition of the large buildings and structures in the industrial area of the plant, so that the property may be returned to the tax roll
- More frequent communications by EPA to local officials and residents updating them on the status and progress of site activities

Additional concerns and issues which were expressed by the community include the following:

- Liability of the PRPs for conducting and funding site investigations and cleanup
- Plans to monitor area drinking-water supplies periodically
- Impact of site activities on area property values
- Potential future uses of the site
- Anticipated schedule for completion of the site cleanup
- Turnover of EPA and other personnel assigned to the site
- Loss of local tax revenue from the site property
- Site security

Based on the attendance at public meetings and the overall feedback EPA has received from the public, the level of community interest in the NL site can be characterized as moderately high.

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Document Number: NLD-001-0263 To 0263 Date: 10/15/90

Title: (Letter regarding applicable or relevant requirements for testing at the site)

Type: CORRESPONDENCE
Author: Holstrom, Christina: NJ Dept of Environmental Protection
Recipient: Gilbert, Michael H: US EPA

Document Number: NLD-001-0264 To 0277 Date: 11/27/90

Title: (Referral form forwarding attached surface water ARARs for the site)

Type: CORRESPONDENCE
Author: Holstrom, Christina: NJ Dept of Environmental Protection
Recipient: Gilbert, Michael H: US EPA

Document Number: NLD-001-0278 To 0291 Date: 07/01/91

Title: (EPA announcement regarding Proposed Plan for NL Industries site)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: none

Document Number: NLD-001-0292 To 0528 Date: 07/01/91

Title: Draft Focused Feasibility Study - NL Industries Superfund Site Operable Unit 2

Type: REPORT
Condition: DRAFT
Author: none: US EPA
Recipient: none: none

RESPONSIVENESS SUMMARY

RECORD OF DECISION

NL INDUSTRIES, INC. SUPERFUND SITE

I. Introduction

The NL Industries, Inc. (NL) site, located in Pedricktown, New Jersey, consists of an abandoned, secondary lead smelting facility. Past treatment, handling and disposal practices at the facility have resulted in extensive inorganic contamination of the air, soil, ground water, surface water and stream sediments. In addition, when the site was abandoned, significant areas of hazardous surface contamination were left in the industrial area of the plant. EPA has designated remediation of these areas of hazardous surface contamination as Operable Unit 2, which is the subject of this document. EPA has conducted a Focused Feasibility Study (FFS) to identify and evaluate remedial alternatives to address these areas which include the slag and lead oxide piles, debris and contaminated surfaces, and standing water and sediments. In addition, a comprehensive, site-wide Remedial Investigation (RI) was completed in July 1991 and a site-wide Feasibility Study addressing other areas of contamination, which EPA has designated as Operable Unit 1, is currently underway.

In accordance with the U.S. Environmental Protection Agency's (EPA's) community relations policy and guidance and the public participation requirements of the Comprehensive Environmental Response, Compensation, and Liability Act, EPA originally established a public comment period from July 17, 1991 through August 16, 1991 to obtain comments on the Proposed Plan for this site. At the request of a potentially responsible party (PRP) for the site, the public comment period was extended until September 6, 1991.

EPA held a public meeting on August 6, 1991 at the Oldmans Middle School located in Pedricktown, New Jersey. At this meeting, EPA provided a general overview of the Superfund process, the site history, the results of the site-wide RI, the results of the FFS for Operable Unit 2, and discussed the Proposed Plan for Operable Unit 2. Subsequent to this presentation, EPA responded to questions and comments of interested parties. A summary of the questions received during the public meeting and during the public comment period are contained in this Responsiveness Summary.

The Responsiveness Summary, required as part of the Superfund process, provides a summary of citizens' comments and concerns. Section II of this document provides a brief background of the community involvement and concerns regarding the site. Section III presents a summary of the significant questions and comments

Document Number: NLD-001-0035 To 0035 Parent: NLD-001-0034 Date: 09/24/90

Title: (Letter regarding the proposed utilization of the slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Leed, Jeff: Exide Corporation

Document Number: NLD-001-0036 To 0036 Date: 06/15/90

Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Roberts, Jill: Sunapee Chemicals Inc

Document Number: NLD-001-0037 To 0037 Date: 05/21/90

Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Rosenberg, Henry: Cometals Inc

Document Number: NLD-001-0038 To 0038 Date: 05/21/90

Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Sawhney, Ripp: Westenmore Metals

Document Number: NLD-001-0039 To 0157 Date: 06/08/90

Title: Final Removal Action/Feasibility Study Report for the National Lead Industry Site, Pedricktown NJ

Type: REPORT
Author: none: Roy F Weston Inc
Recipient: none: US EPA

Document Number: NLD-001-0158 To 0158 Date: 05/10/91

Title: (Letter requesting State Water Quality Standards)

Type: CORRESPONDENCE
Condition: MARGINALIA
Author: Gilbert, Michael H: US EPA
Recipient: Holstrom, Christina: NJ Dept of Environmental Protection

Document Number: NLD-001-0159 To 0199 Date: 05/22/91

Title: (Soil) Analytical Report - National Lead Industries

Type: PLAN
Author: Hunter, J: Roy F Weston Inc
Recipient: Zownir, A: US EPA

Document Number: NLD-001-0200 To 0256 Date: 04/11/91

Title: (Water) Analytical Report - National Lead Industries

Type: PLAN
Author: Hunter, J: Roy F Weston Inc
Recipient: Zownir, A: US EPA

Document Number: NLD-001-0257 To 0262 Date: 04/17/89

Title: (Memo forwarding attached Preliminary Health Assessment for NL Industries)

Type: CORRESPONDENCE
Author: Nelson, William: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: Donato, Kerwin: US EPA

Document Number: NLD-001-0012 To 0018 Date: 02/14/91

Title: NL Industries Standing Water Sampling Plan

Type: PLAN
Author: Kelley, Carl: Roy F Weston Inc
Recipient: Dominach, Eugene: US EPA

Document Number: NLD-001-0024 To 0033 Date: 0?/01/91

Title: Slag Pile TAL Sampling Plan - NL Industries, Pedricktown, Salem NJ

Type: PLAN
Author: Mentzel, Michael: Weston Spill Prevention & Emergency Response Div (SPER)
Recipient: Dominach, Eugene: US EPA

Document Number: NLD-001-0257 To 0262 Date: 04/17/89

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Type: CORRESPONDENCE
Author: Nelson, William: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: Donato, Kerwin: US EPA

Document Number: NLD-001-0002 To 0011 Date: / /

Title: Potential Hazardous Waste Site Site Inspection Report - NL Industries Inc.

Type: PLAN
Author: Zervas, David: NJ Dept of Environmental Protection
Recipient: none: none

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Document Number: NLD-001-0002 To 0011 Date: / /

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Author: Zervas, David: NJ Dept of Environmental Protection
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Document Number: NLD-001-0012 To 0018 Date: 02/14/91

Title: NL Industries Standing Water Sampling Plan

Type: PLAN
Author: Kelley, Carl: Roy F Weston Inc
Recipient: Dominach, Eugene: US EPA

Document Number: NLD-001-0019 To 0023 Date: 05/09/91

Title: (Memo regarding NL Industries Disposal Status Report; inventory lists attached)

Type: CORRESPONDENCE
Author: Budroe, Thomas: none
Recipient: Dominach, Eugene: US EPA

Document Number: NLD-001-0024 To 0033 Date: 02/01/91

Title: Slag Pile TAL Sampling Plan - NL Industries, Pedricktown, Salem NJ

Type: PLAN
Author: Mentzel, Michael: Weston Spill Prevention & Emergency Response Div (SPER)
Recipient: Dominach, Eugene: US EPA

Document Number: NLD-001-0034 To 0034 Date: 01/24/91

Title: (Letter regarding the proposed utilization of excess NL materials by Exide Corporation, and forwarding analytical information)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Leed, Jeff: Exide Corporation
Attached: NLD-001-0035

Document Number: NLD-001-0035 To 0035 Parent: NLD-001-0034 Date: 09/24/90

Title: (Letter regarding the proposed utilization of the slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Leed, Jeff: Exide Corporation

Document Number: NLD-001-0036 To 0036 Date: 06/15/90

Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Roberts, Jill: Sunapee Chemicals Inc

Document Number: NLD-001-0037 To 0037 Date: 05/21/90

Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Rosenberg, Henry: Cometals Inc

Document Number: NLD-001-0038 To 0038 Date: 05/21/90

Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Gilbert, Michael H: US EPA
Recipient: Sawhney, Ripp: Westenmore Metals

Document Number: NLD-001-0158 To 0158 Date: 05/10/91

Title: (Letter requesting State Water Quality Standards)

Type: CORRESPONDENCE
Condition: MARGINALIA
Author: Gilbert, Michael H: US EPA
Recipient: Holstrom, Christina: NJ Dept of Environmental Protection

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Document Number: NLD-001-0263 To 0263 Date: 10/15/90

Title: (Letter regarding applicable or relevant requirements for testing at the site)

Type: CORRESPONDENCE
Author: Holstrom, Christina: NJ Dept of Environmental Protection
Recipient: Gilbert, Michael H: US EPA

Document Number: NLD-001-0264 To 0277 Date: 11/27/90

Title: (Referral form forwarding attached surface water ARARs for the site)

Type: CORRESPONDENCE
Author: Holstrom, Christina: NJ Dept of Environmental Protection
Recipient: Gilbert, Michael H: US EPA

Document Number: NLD-001-0159 To 0199 Date: 05/22/91

Title: (Soil) Analytical Report - National Lead Industries

Type: PLAN
Author: Hunter, J: Roy F Weston Inc
Recipient: Zownir, A: US EPA

Document Number: NLD-001-0200 To 0256 Date: 04/11/91

Title: (Water) Analytical Report - National Lead Industries

Type: PLAN
Author: Hunter, J: Roy F Weston Inc
Recipient: Zownir, A: US EPA

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Document Number: NLD-001-0015 To 0023 Date: 05/09/91

Title: (Memo regarding NL Industries Disposal Status Report; inventory lists attached)

Type: CORRESPONDENCE
Author: Budroe, Thomas: none
Recipient: Dominach, Eugene: US EPA

Document Number: NLD-001-0158 To 0158 Date: 05/10/91

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Title: (Soil) Analytical Report - National Lead Industries

Type: PLAN
Author: Hunter, J: Roy F Weston Inc
Recipient: Zownir, A: US EPA

Document Number: NLD-001-0278 To 0291 Date: 07/01/91

Title: (EPA announcement regarding Proposed Plan for NL Industries site)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: none

Document Number: NLD-001-0292 To 0528 Date: 07/01/91

Title: Draft Focused Feasibility Study - NL Industries Superfund Site Operable Unit 2

Type: REPORT
Condition: DRAFT
Author: none: US EPA
Recipient: none: none

Document Number: NLD-001-0039 To 0157 Date: 06/08/90

Title: Final Removal Action/Feasibility Study Report for the National Lead Industry Site, Pedricktown NJ

Type: REPORT
Author: none: Roy F Weston Inc
Recipient: none: US EPA

Document Number: NLD-001-0270 To 0291 Date: 07/01/91

Title: (EPA announcement regarding Proposed Plan for NL Industries site)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: none

Document Number: NLD-001-0292 To 0528 Date: 07/01/91

Title: Draft Focused Feasibility Study - NL Industries Superfund Site Operable Unit 2

Type: REPORT
Condition: DRAFT
Author: none: US EPA
Recipient: none: none

Document Number: NLD-001-0019 To 0023 Date: 05/09/91

Title: (Memo regarding NL Industries Disposal Status Report; inventory lists attached)

Type: CORRESPONDENCE
Author: Budroe, Thomas: none
Recipient: Dominach, Eugene: US EPA

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Title: (Letter regarding the proposed utilization of slag piles at the site, and forwarding requested analysis)

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Author: Gilbert, Michael H: US EPA
Recipient: Roberts, Jill: Sunapee Chemicals Inc

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Condition: MISSING ATTACHMENT
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Recipient: Leed, Jeff: Exide Corporation

Document Number: NLD-001-0263 To 0263 Date: 10/15/90

Title: (Letter regarding applicable or relevant requirements for testing at the site)

Type: CORRESPONDENCE
Author: Holstrom, Christina: NJ Dept of Environmental Protection
Recipient: Gilbert, Michael H: US EPA

Document Number: NLD-001-0264 To 0277 Date: 11/27/90

Title: (Referral form forwarding attached surface water ARARs for the site)

Type: CORRESPONDENCE
Author: Holstrom, Christina: NJ Dept of Environmental Protection
Recipient: Gilbert, Michael H: US EPA

Document Number: NLD-001-0034 To 0034 Date: 01/24/91

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Author: Gilbert, Michael H: US EPA
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Author: Kelley, Carl: Roy F Weston Inc
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ADMINISTRATIVE RECORD INDEX

Chronological

Author Name

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Recipient: none: none

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Type: CORRESPONDENCE
Author: Nelson, William: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: Donato, Kerwin: US EPA

Document Number: NLD-001-0837 To 0837 Date: 05/21/90

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Recipient: Sawhney, Ripp: Westenmore Metals

TABLE 12

SUMMARY OF REMEDIAL ALTERNATIVES FOR STANDING WATER AND SEDIMENTS

Criteria	Alternative SW-1 No Action	Alternative SW-2 On-Site Treatment and Groundwater Recharge	Alternative SW-3 Off-Site Treatment and Disposal
6. Implementability			
Technical Feasibility			
o Ability to construct and operate technology	No construction involved. Monitoring program can be easily implemented.	Easy to construct and operate all aspects of this technology.	Availability of off-site treatment facilities may be potential problem.
o Reliability of technology	No treatment technology involved. Monitoring is reliable.	All aspects of this technology are very reliable.	Same as Alternative SW-2.
o Ease of undertaking additional remedial action, if necessary.	If monitoring indicates that future action is necessary, must go through the FS/ROD process again.	If found necessary, additional water could be treated using this facility.	Same as Alternative SW-2 assuming facility can handle additional volume of water.
o Monitoring Considerations	Long-term monitoring required. Migration/exposure pathways can be monitored.	No monitoring required after completion of remedial actions.	Same as Alternative SW-2.
Administrative Feasibility			
• Coordination with other agencies	Coordination required with appropriate agencies for long time period for monitoring and reviewing site conditions.	Coodination required with EPA, DOT and State agencies during remedial actions.	Same as Alternative SW-2. In addition coordination required with local traffic authorities.
Availability of Services and Materials			
o Availability of treatment, storage capacity and disposal services.	No treatment, storage or disposal facilities required.	All of these technologies are proven and readily available.	All these technologies are proven, however facility availability may be limited.

TABLE 12

SUMMARY OF REMEDIAL ALTERNATIVES FOR STANDING WATER AND SEDIMENTS

Criteria	Alternative SW-1 No Action	Alternative SW-2 On-Site Treatment and Groundwater Recharge	Alternative SW-3 Off-Site Treatment and Disposal
6. Implementability (Cont'd)			
• Availability of necessary equipment, specialists and materials.	Equipment and specialists for monitoring and implementing public awareness program are readily available locally.	Several vendors can provide all necessary equipment, specialists and materials.	Facility availability may be limited.
• Availability of technologies	None required.	Technologies are commercially available from several vendors.	Technologies are readily available. Facilities may be limited.
7. Costs			
• Total Capital Cost ($)	0	1,335,000	993,200
• Annual operation and maintenance (O&M) cost ($/yr)	10,700	0	0
• Present worth* ($ based on 5.0% discount rate and 30 year period)	220,100	1,335,000	993,200

* Present worth cost includes approximately $20,000 for Alternative SW-1 for each five-year review and site assessment.

TABLE 12

SUMMARY OF REMEDIAL ALTERNATIVES FOR STANDING WATER AND SEDIMENTS

Criteria	Alternative SW-1 No Action	Alternative SW-2 On-Site Treatment and Groundwater Recharge	Alternative SW-3 Off-Site Treatment and Disposal
3. Long-Term Effectiveness			
o Magnitude of residual risks	Standing water and sediments would not be treated or removed. Existing risk will essentially remain. Natural attenuation is a very slow process.	No residual risks to public health or the environment remain after remedial action is completed.	Same as Alternative SW-2.
o Adequacy of controls	No remedial actions and therefore potential exposures remain the same.	These technologies are proven methods for handling these types of contaminants.	Same as Alternative SW-2.
o Reliability of Control	Monitoring program is reliable to assess contaminant migration.	These operations are reliable processes for handling the contaminated standing water and sediments.	Same as Alternative SW-2.
4. Reduction of Toxicity, Mobility and Volume Through Treatment			
o Treatment process and remedy	No treatment employed, conditions (toxicity, mobility and volume of contaminants) remain the same. Volume of contaminated standing water and sediments may increase.	Significant overall reduction in toxicity, mobility and volume of contaminants of concern in standing water and sediments.	Totally eliminates the toxicity, mobility and volume of all contaminants of concern in standing water and sediments at the site.
o Amount of hazardous material destroyed or treated.	None by treatment.	All standing water containing contaminants in excess of cleanup levels and approximately 200 cy of sediments underlying the standing water.	Same as Alternative SW-2.
o Reduction of toxicity, mobility and volume (TMV).	None by treatment.	Toxicity, mobility and volume of contaminated standing water significantly reduced.	Toxicity, mobility and volume of contaminated standing water at the site would be eliminated.

TABLE 12

SUMMARY OF REMEDIAL ALTERNATIVES FOR STANDING WATER AND SEDIMENTS

Criteria	Alternative SW-1 No Action	Alternative SW-2 On-Site Treatment and Groundwater Recharge	Alternative SW-3 Off-Site Treatment and Disposal
4. Reduction of Toxicity, Mobility and Volume Through Treatment (Cont'd)			
o Irreversibility of treatment	No treatment involved.	Treatment is irreversible.	Same as Alternative SW-2.
o Type and quantity of treatment residues	No treatment involved.	Sludge would be generated and disposed of off-site. Total quantity of sludge and sediment is estimated to be 358 tons.	No treatment residue remains on site.
5. Short-Term Effectiveness			
o Protection of community during remedial actions	No short-term risks to community.	Minimal short-term risks	Same as Alternatuve SW-2.
o Protection of workers during remedial actions	No significant short-term risk. Personnel protection equipment would be used during sampling activities.	Applicable OSHA regulations, would be followed. Personnel protective equipment would be provided for workers.	No significant short-term risk. Personnel protective equipment would be provided to prevent direct contact with contaminated water and sediments.
o Environmental impacts	No short-term risks during implementation of this alternative.	No major environmental impacts during implementation of this remedial alternative.	Increased traffic and noise pollution resulting from hauling of contaminated water and sediments to off-site treatment facility. Possibility of spillage along the transport route.
o Time until remedial response objectives are achieved	Natural attenuation takes long period of time, over 30 years. It would take 3 months to implement the monitoring and institutional programs.	Overall remediation period is approximately 14 months. Actual remediation period is approximately 3 months.	Overall remediation period is approximately 6 months. Actual remediation period is approximately 3 months.

TABLE 11

SUMMARY OF REMEDIAL ALTERNATIVES FOR DEBRIS AND CONTAMINATED SURFACES

Criteria	Alternative CS-1 No Action	Alternative CS-2 Contaminated Surfaces Decontamination/ Off-Site Treatment and Disposal
6. Implementability		
Technical Feasibility (Cont'd)		
o Ease of undertaking additional remedial action, if necessary.	If monitoring indicates that future action is necessary, must go through the FS/ROD process again.	If additional contaminated surfaces are found during remedial action, they can be decontaminated at that time.
o Monitoring Considerations	Monitoring and 5-year reviews are required because contaminants remain on site.	No monitoring required after remedial actions are completed.
Administrative Feasibility		
o Coordination with other agencies	Coordination required with appropriate agencies for long time period for monitoring and reviewing site conditions.	Coordination required with DOT and local traffic authorities for transporting the contaminated dust to the off-site treatment and disposal facility.
Availability of Services and Materials		
o Availability of treatment, storage capacity and disposal services.	No treatment, storage or disposal facilities are required.	All of these services are available from several vendors.
o Availability of necessary equipment, specialists and materials.	Equipment and specialists for sealing building and for monitoring are readily available.	Equipment and specialists for performing the decontamination are readily available. Several RCRA-permitted facilities can accept the contaminated dust and water for off-site treatment and disposal.
o Availability of technologies	None required.	All technologies are proven and readily available from several sources.
7. Costs		
o Total Capital Cost ($)	17,700	1,691,100
o Annual Operation and Maintenance (O&M) Cost ($/yr)	6,800	0
o Present Worth* ($ based on 5.0% discount rate and 30-year period)	136,100	1,691,100

* Present worth cost includes approximately $5,000 for Alternative CS-1 for each five-year review and site assessemnt.

TABLE 12

SUMMARY OF REMEDIAL ALTERNATIVES FOR STANDING WATER AND SEDIMENTS

Criteria	Alternative SW-1 No Action	Alternative SW-2 On-Site Treatment and Groundwater Recharge	Alternative SW-3 Off-Site Treatment and Disposal
Key Components	Long-term monitoring and 5-year reviews. Public awareness and education program.	Standing water and sediments would be collected and treated for metals removal via chemical precipitation, flocculation, and filtration. Ion exchange would be used, if necessary. The treated water would then be recharged to groundwater via injection wells or infiltration basins. Drains would be decontaminated and unplugged.	Collection of standing water an sediments, and transport to a RCRA permitted treatment and disposal facility. Drains woul be decontaminated and unplugged
1. Overall Protection of Human Health and the Environment	Essentially no reduction in toxicity, mobility or volume of hazardous contaminants in the standing water. Risk from contaminant migration is monitored but not reduced. Does not meet the remedial objectives for the site and therefore does not provide protection to human health or the environment.	This alternative would remove and treat the contaminated water thereby eliminating all human health and environmental risks associated with the standing water, resulting in overall permanent protection to human health and the environment.	Same as Alternative SW-2
2. Compliance with ARARs			
• Contaminant-specific ARARs	Would not comply. Would leave contaminated water and sediments on site.	Would comply because removes contaminated water and sediments and treats to discharge standards.	Would comply by removing contaminated water from the site.
• Action-specific ARARs	Would comply.	Would comply with action-specific ARARs.	Same as Alternative SW-2.
• Location-specific ARARs	Would not comply.	Would comply with all locatin-specific ARARs.	Same as Alternative SW-2.

TABLE 11

SUMMARY OF REMEDIAL ALTERNATIVES FOR DEBRIS AND CONTAMINATED SURFACES

Criteria	Alternative CS-1 No Action	Alternative CS-2 Contaminated Surfaces Decontamination/ Off-Site Treatment and Disposal
Key Components	Restrict building access and use of buildings and equipment. Roof repairs to prevent leakage. Long-term inspection and maintenance program including five-year reviews to assess site conditions.	Decontaminate buildings and equipment via dusting, vacuuming and wiping and send dust for off-site treatment and disposal. Hydroblasting would be used to clean parts of building and this water would then be treated and disposed of with the standing water. Recyclable materials would be recycled.
1. Overall Protection of Human Health and the Environment	Provides protection to human health and the environment as long as the building is locked and its use is prohibited and there is no further significant deterioration.	Provides overall permanent protection to human health and environment.
2. Compliance with ARARs		
o Contaminant-specific ARARs	Would not comply.	Would comply by removing and decontaminating contaminated surfaces and debris.
o Action-specific ARARs	Would comply.	Would comply with all action-specific ARARs.
o Location-specific ARARs	Would comply.	Would comply with all location-specific ARARs.
3. Long-Term Effectiveness		
o Magnitude of residual risks	Source would not be removed or treated, therefore residual risk remains. However, access would be restricted so that risks would be reduced.	No remaining risks after completion of remedial action.
o Adequacy of controls	The long-term maintenance program is designed to maintain the security of the building and is effective in minimizing trespassing.	The building decontamination and off-site treatment and disposal procedures are proven technologies.
o Reliability of Control	Building access control and security are reliable at minimizing access, although susceptible to vandalism.	All technologies are very reliable.
4. Reduction of Toxicity, Mobility and Volume Through Treatment		
o Treatment process and remedy	Locking building and roof repair would reduce mobility of contaminants. Toxicity and volume of contaminants remain unchanged.	Decontamination, off-site treatment and disposal are very effective at reducing toxicity, mobility and volume of contaminants in the buildings.

TABLE 11

SUMMARY OF REMEDIAL ALTERNATIVES FOR DEBRIS AND CONTAMINATED SURFACES

Criteria	Alternative CS-1 No Action	Alternative CS-2 Contaminated Surfaces Decontamination/ Off-Site Treatment and Disposal
4. Reduction of Toxicity, Mobility and Volume Through Treatment (Con'td)		
o Amount of hazardous material destroyed or treated.	None by treatment.	All of the contaminated dust (approximately 70 cy) and debris (approximately 2,5000 cy) would be removed, treated and disposed of.
o Reduction of toxicity, mobility and volume (TMV).	Mobility is reduced by containing contaminants within building. Toxicity and volume of contaminants remains unchanged.	Toxicity, mobility and volume of building contaminants would be reduced.
o Irreversibility of treatment	No treatment. If building security is breached , exposure risks increase to current levels.	Treatment is irreversible.
o Type and quantity of treatment residues	No treatment involved.	No treatment residues remain.
5. Short-Term Effectiveness		
o Protection of community during remedial actions	No protection required.	Minimal risks due to increase in dust during remedial action. Safeguards would be implemented to minimize these risks.
o Protection of workers during remedial actions	Applicable OSHA regulations would be observed to prevent workers from normal construction hazards during roof repair.	Applicable OSHA regulations and personnel protective equipment would be used to protect workers during implementation of remedial actions.
o Environmental impacts	No environmental impacts from remedial actions.	No environmental impacts from remedial actions.
o Time until remedial response objectives are achieved	This alternative would not achieve the response objectives. It would take approximately 1 month to secure the buildings.	Time required to achieve response objectives is approximately 12 months. Actual remediation period is estimated to be 3 months.
6. Implementability		
Technical Feasibility		
o Ability to construct and operate technology	Sealing of building is easily implemented.	Dusting, vacuuming, wiping and hydroblasting technologies are easily implemented. Several off-site treatment and disposal facilities can handle the contaminated materials.
o Reliability of technology	Building access control and security techniques are reliable technologies. However, they could be breached by vandalism.	All technologies employed in this alternative are reliable.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-5 On-Site Stabilization (Solidification)/ On-Site Disposal
6. Implementability	
Technical Feasibility	
o Ability to construct and operate technology	Easily implementable on site using mobile treatment units. Sufficient land is available on site for operation of mobile units and disposal of treated materials.
o Reliability of technology	Stabilization/solidification technology is reliable for metal-contaminated waste. This technology is widely used for CERCLA waste.
• Ease of undertaking additional remedial action, if necessary.	Same as Alternative SP-3.
• Monitoring Considerations	Monitoring is required because treated material is disposed of on site.
Administrative Feasibility	
• Coordination with other agencies	Same as Alternative SP-4.
Availability of Services and Materials	
• Availability of treatment, storage capacity and disposal services.	Same as Alternative SP-4.
o Availability of necessary equipment, specialists and materials.	Same as Alternative SP-4.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-5 On-Site Stabilization (Solidification)/ On-Site Disposal
Availability of Services and Materials (Cont'd)	
o Availability of technologies	Same as Alternative SP-4.
7. Costs	
o Total Capital Cost ($)	2,014,000
o Annual operation and maintenance (O&M) cost ($/yr)	17,000
o Present worth[a] ($ based on 5.0% discount rate and 30-year period)	2,303,100

[a] Present worth cost includes approximately $10,000 for Alternative SP-5 for each five-year review and site assessment.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-5 On-Site Stabilization (Solidification)/ On-Site Disposal
Key Components	On-site stabilization/solidification of 9,800 and 200 cy of slag material and lead oxide material respectively, using mobile treatment system. TCLP testing of treated material. On-site disposal in a protective manner in accordance with RCRA treatment standards.
1. Overall Protection of Human Health and the Environment	Achieves overall protection of human health and the environment by reducing the mobility of the contaminants. Toxicity of contaminants would be reduced due to immobilization in stabilized mass.
2. Compliance with ARARs	
o Contaminant-specific ARARs	Will comply with contaminant-specific ARARs.
o Action-Specific ARARs	Will comply with action-specific ARARs
o Location-Specific ARARs	Will comply
3. Long-Term Effectiveness	
o Magnitude of residual risks	Same as Alternative SP-4
• Adequacy of controls	These technologies are proven methods for handling these types of contaminants.
o Reliability of Control	These operations are reliable processes for handling the slag and lead oxide materials.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-5 On-Site Stabilization (Solidification)/ On-Site Disposal
4. Reduction of Toxicity, Mobility and Volume Through Treatment	
• Treatment process and remedy	Reduction in mobility of inorganic contmainants by stabilization/solidification process.
o Amount of hazardous material destroyed or treated.	Approximately 9,800 and 200 cy of slag and lead oxide material respectively would be removed and treated on-site.
o Reduction of toxicity mobility and volume (TMV).	Mobility of contaminants would be reduced. Reduction of toxicity of contaminants due to immobilization in stabilized mass. Volume of solidified material may increase up to 40 percent depending on additives used.
o Irreversibility of treatment	Treatment proces is essentially irreversible over short-term. Long-term irreversibility is not known.
o Type and quantity of treatment residues	Treatment immobilizes contaminants although immobile contaminants remain in treated material.
5. Short-Term Effectiveness	
• Protection of community during remedial actions	Same as Alternative SP-3. In addition, increased dust emissions due to on-site treatment.
• Protection of workers during remedial actions	Same as Alterntive SP-4.
o Environmental impacts	Same as Alternative SP-4.
o Time until remedial response objectives are achieved	Overall remediation period is approximately 15 months. Actual remediation time is estimated to be 3 months.

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TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-1 No Action	Alternative SP-3 Off-Site Flame Reactor	Alternative SP-4 On-Site Hydro-Metallurgical Leaching/On-Site Disposal
6. Implementability (Cont'd)			
o Reliability of technology	No treatment technology involved. Monitoring is reliable.	Treatment technology to date is not yet proven for CERCLA waste on a full-scale basis. However, proven for electric arc furnace dust.	Treatment technology is proven and reliable for extracting metals from ores, however, bench- or pilot-scale treatability study required to develop design criteria for slag and lead oxide materials. Treatment technology is not yet proven for CERCLA waste.
o Ease of undertaking additional remedial action, if necessary.	If monitoring indicates that future action is necessary, must go through the FS/ROD process again.	If additional slag and lead oxide material requires treatment, it can be easily removed during remedial activities.	Same as Alternative SP-3. In addition if treatment objectives are not being met, design criteria could be re-evaluated.
o Monitoring Considerations	Long-term monitoring required. Migration/exposure pathways can be monitored.	No monitoring required after remediation is completed.	Long-term monitoring is required due to disposal of treated materials on site.
Administrative Feasibility			
o Coordination with other agencies	Coordination required with appropriate agencies for long time period for monitoring and reviewing site conditions.	Coordination with State and local agencies required. Transportation of the waste to an off-site facility requires coordination with DOT and local traffic department.	Coordination with State and local agencies required.
Availability of Services and Materials			
o Availability of treatment, storage capacity and disposal services.	No treatment, storage or disposal facilities required.	Commercial facility not currently available, although it is expected to be available in a year.	Several vendors can provide mobile treatment units. Sufficient space is available on site for treatment and disposal of treated material.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-1 No Action	Alternative SP-3 Off-Site Flame Reactor	Alternative SP-4 On-Site Hydro-Metallurgical Leaching/On-Site Disposal
o Availability of necessary equipment, specialists and materials.	Equipment and specialists for monitoring and implementing public awareness program are readily available locally.	Only one vendor is available for this technology (at this time), therefore competitive bids may not be available.	All necessary equipment, specialists and materials are readily available from several vendors. However, modified design may be required for materials in question.
o Availability of technologies	None required.	Treatment technology may not be available on full-scale basis at the time of remediation.	Treatment technology is proven and readily available.
7. Costs			
• Total Capital Cost ($)	0	4,215,100**	2,980,400
• Annual operation and maintenance (O&M) cost ($/yr)	25,000	0**	17,000
• Present worth* ($ based on 5.0% discount rate and 30-year period)	439,900	4,215,100**	3,269,500

* Present worth cost includes approximately $20,000 for Alternative SP-1 and $10,000 for Alternatives SP-4 for each five-year review and site assessment.
** This cost estimate is based on the assumption that treated materials would be recycled.
Cost may increase if markets are not available and treated material would have to be disposed of.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-1 No Action	Alternative SP-3 Off-Site Flame Reactor	Alternative SP-4 On-Site Hydro-Metallurgical Leaching/On-Site Disposal
4. Reduction of Toxicity, Mobility and Volume Through Treatment (Cont'd)			
o Irreversibility of treatment	No treatment involved.	Treatment process is irreversible.	Treatment process is irreversible.
o Type and quantity of treatment residues	All the contaminants remain on site.	No treatment residues on site. Treated slag and lead oxide could possibly be recycled.	Minimal contaminated residues remain in treated residues. Treated residue is expected to pass TCLP.
5. Short-Term Effectiveness			
o Protection of community during remedial actions	Short-term risk to community is not applicable since no remedial action involved.	Temporary increase in direct contact risks and inhalation of fugitive dust to community. Dust control measures would be provided.	Same as Alternative SP-3. In addition, increased risk due to use of chemicals in on-site treatment.
o Protection of workers during remedial actions	No significant short-term risk.	Increased risk of dermal contact and inhalation of dust to workers. However personal protective equipment would be provided.	Same as Alternative SP-3, only slightly increased risk due to performance of treatment on site.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-1 No Action	Alternative SP-3 Off-Site Flame Reactor	Alternative SP-4 On-Site Hydro-Metallurgical Leaching/On-Site Disposal
o Environmental impacts	Continued contamination of surface water, groundwater, soils and air from existing conditions.	Increase in traffic, noise and dust due to remedial activities. Erosion and sediment control measures would be provided to minimize contaminant migration during remedial activities. In addition, potential accidents and spillage would exist during off-site transport of contaminated material.	Same as Alternative SP-3, however, slightly less traffic.
o Time until remedial response objectives are achieved	Natural attenuation takes long period of time, over 30 years. It would take 3 months to implement the monitoring and institutional programs.	Overall remediation period is approximately 18 months. Actual remediation period is estimated to be approximately 6 months.	Overall remediation period is approximately 16 months. Actual remediation period is estimated to be 4 months.
6. **Implementability**			
Technical Feasibility			
o Ability to construct and operate technology	No construction involved. Monitoring wells are already installed.	Technology is being tested under EPA's SITE Program currently. The vendor envisions a full-scale unit for treating CERCLA waste to be operational in one year. Contaminated slag and lead oxide material would have to undergo a series of analyses prior to acceptance for treatment at an off-site facility.	Easy to implement on-site. Sufficient land is available on site for operation of mobile system. Bench or pilot-scale treatability study would be needed to develop design criteria.

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-1 No Action	Alternative SP-3 Off-Site Flame Reactor	Alternative SP-4 On-Site Hydro-Metallurgical Leaching/On-Site Disposal
Key Components	Long-term monitoring 5-year reviews. Public awareness and education programs.	Off-site treatment of 9,800 and 200 cy of slag material and lead oxide material, respectively, at a RCRA permitted flame reactor facility. Possibly recycle treated matrial as fill material or road aggregate.	On-site treatment of 9,800 and 200 cy of slag material and lead oxide material, respectively, using a hydrometallurgical leaching process. TCLP testing of treated material, followed by on-site disposal in protective manner in accordance with RCRA treatment standards.
1. Overall Protection of Human Health and the Environment	There is essentially no reduction in toxicity, mobility or volume of contaminants. Contaminant migration is monitored but risk is not reduced. Migration of contaminants from the slag and lead oxide materials to the surface water, groundwater, soil and air would continue. This alternative does not meet any of the remedial objectives and therefore is not protective of human health and the environment.	The removal and treatment of the slag and lead oxide materials would reduce the toxicity, mobility and volume of hazardous contaminants in the materials, thereby significantly reducing the potential risks to human health and the environment. Results in overall, permanent protection of human health and the environment.	May reduce the public health and environmental risks associated with concerned exposure pathways, and may result in overall protection of human health and the environment. The uncertainty associated with this alternative exists due to the presence of multiple metals. Technology never used on these types of materials. Treatability studies would be performed to determine if treatment objectives can be achieved.
2. Compliance with ARARs			
o Contaminant-specific ARARs	Would not comply Contaminants remain on-site.	Would comply. Removes slag and lead oxide materials from the site.	May comply. Some uncertainty exists due to multiple contaminants.
o Action-specific ARARs	Would comply with ARARs associated with monitoring.	Would comply with all action-specific ARARs.	Would comply with all action-specific ARARs
o Location-specific ARARs	Would not comply	Would comply	Would comply

TABLE 10

SUMMARY OF REMEDIAL ALTERNATIVES FOR SLAG AND LEAD OXIDE MATERIALS

Criteria	Alternative SP-1 No Action	Alternative SP-3 Off-Site Flame Reactor	Alternative SP-4 On-Site Hydro-Metallurgical Leaching/On-Site Disposal
3. Long-Term Effectiveness			
o Magnitude of residual risks	Source would not be removed or treated. Existing risk would essentially remain. Natural attenuation is very slow process for type of contaminants involved and would lead to surface and groundwater contamination.	Slag and lead oxide materials would be removed and treated off-site, therefore, no residual risk remains.	After remediation is completed there are minimal remaining risks.
o Adequacy of controls	Potential exposures remain the same.	Flame reactor technology is proven for electric furnace dust, but being tested for CERCLA waste.	Treatability studies would be performed to test if treatment objectives can be achieved. Assuming these objectives can be met, then these technologies would adequately handle these types of contaminants.
o Reliability of Control	Monitoring program is reliable to assess contaminant migration.	These operations are considered reliable for handling metal wastes.	Assuming treatability studies show that treatment objectives could be met, then these technologies would be reliable processes for handling the slag and lead oxide materials. Some uncertainty associated with multiple contaminants.
4. Reduction of Toxicity, Mobility and Volume Through Treatment			
o Treatment process and remedy	No treatment employed, conditions (toxicity, mobility and volume of contaminant) remain the same.	Slag and lead oxide materials would be eliminated as a source of contamination.	Same as Alternative SP-3, assuming treatability studies show that treatment objectives would be met.
o Amount of hazardous material destroyed or treated.	None by treatment. Natural attenuation continues to take place.	Approximately 9,800 and 200 cy of slag and lead oxide material, respectively removed and treated off site.	Approximately 9,800 and 200 cy of slag and lead oxide materials removed and treated assuming treatability studies demonstrate that treatment objectives could be met.
o Reduction of toxicity, mobility and volume (TMV).	None by treatment.	Complete reduction of toxicity, mobility and volume of contaminants in slag and lead oxide material.	Same as Alternative SP-3 assuming treatability studies demonstrate that treatment objectives could be met.

TABLE 8

LOCATION-SPECIFIC ARARS

REGULATORY LEVEL	ARARS	STATUS	REQUIREMENT SYNOPSIS
Federal	Fish and Wildlife Coordination Act 16 USC 661[1]	Relevant and Appropriae	Details requirements with regard to the protection of fish and wildlife.
Federal	National Historic Preservation Act	Relevant and Appropriate	Sets forth requirements for the preservation of items of cultural or historic value.
New Jersey	New Jersey Rules on Coastal Resources and Development (7:7E-1.1 et seq)	To be considered	Regulates the development of coastal areas in certain counties in the State of New Jersey.
New Jersey	Delaware River Basins Compact NJSA 58:18-18	To Be Considered	Regulates all projects significantly affecting water resources within the jurisdiction of the Delaware River Basin Commission.

1) Applies to alternatives including discharge to surface waters.

TABLE 9

CONTAMINANT - SPECIFIC ARARs
(ug/L unless otherwise noted)

COMPOUND	FEDERAL CWA WQC (FISH & WATER)[1]	FEDERAL SDWA MCLs[2]	FEDERAL SDWA MCLGs[3]	NJ SURFACE WQ STANDARDS[4]	NJ GROUND WQ STANDARDS[5]	SITE-SPECIFIC EPA CRITERIA FOR SURFACE DISCHARGE
Arsenic	-	50	-	50	50	0.14[7]
Barium	-	1000	5000	1000	1000	-
Cadmium	10	10	5	10	10	0.66[8]
Chromium	50	50	1.2	50	50	11[8]
Copper	1000	1000	1300	-	-	2.9[8]
Lead	50	15[6]	20	50	50	1.3[8]
Mercury	-	2	-	2	2	0.012[8]
Nickel	13.4	-	-	-	-	-
Selenium	-	10	-	10	10	5[8]
Silver	50	50	-	50	50	1.2[9]
Zinc	5000	-	-	-	-	59[8]
Cyanide	200	-	-	-	200	-
pH	-	-	-	6.5-8.5	5-9	-
TDS	-	-	-	-	500,000	NA
BOD (5 day)	-	-	-	-	3,000	

1. Federal Clean Water Act Water Quality Criteria.
2. Federal Safe Drinking Water Act, Maximum Contaminant levels.
3. Federal Safe Drinking Water Act, Maximum Contaminant Level Goals.
4. New Jersey Surface Water Quality Standards.
5. New Jersey Ground Water Quality Standards.
6. EPA Action Level for Lead - May 7, 1991.
7. EPA recommended criterion for the protection of human health from consumption of aquatic organisms at a 10^{-6} risk level.
8. EPA recommended criterion for the protection of aquatic life due to chronic toxicity.
9. EPA recommended criterion for the protection of aquatic life due to acute toxicity.

TABLE 7

ACTION-SPECIFIC ARARS

REGULATORY LEVEL	ARARS	STATUS	REGULATORY SYNPOSIS
A. Common to all Alternatives	OSHA - General Industries Standards (29 CFR 1910)	Applicable	These standards regulate the 8-hour time weighted average concentration for worker exposure to various compounds. Timing requirements for workers at hazardous wastes operations are also specified.
	OSHA - Safety and Health Standards (29 CFR 1926)	Applicable	This regulation specifies the type of safety equipment and procedures to be followed during site remediation.
	OSHA - Recordkeeping, Reporting and Related Regulations (29 CFR 1904)	Applicable	This regulation outlines the recordkeeping and reporting requirements for an employer under OSHA.
	RCRA TSDF Regulation (40 CFR 264 and 265 subparts A, B, C, D, E, F, G, L, and N)	Relevant and Appropriate	Provides standards for hazardous waste treatment facilities with regard to design and operation of treatment and disposal systems (ie, general facility standards, landfills, incinerators, containers, etc.)
	RCRA Requirements for transporting waste for Off-Site Disposal (40 CFR 263)[3]	Relevant and Appropriate	Provides manifest and record keeping requirements for generators of hazardous waste.
	RCRA Standards for Generators of Hazardous Waste (40 CFR 262)	Applicable	General standards for generators of hazardous waste.
	RCRA Nonhazardous Waste Management Standards (40 CFR 257)[2]	Applicable	Provides standards for the management of non-hazardous waste under RCRA Subpart D.
	RCRA Groundwater Monitoring Requirements (40 CFR 264 Subpart F)[4]	Applicable	This regulation details requirements for groundwater monitoring programs.
	National Emission Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR 61)	Relevant and Appropriate	Provides standards for acceptable limits for specific chemicals in air emissions. Requirements address operational, record keeping, and general emission standards that apply to air pollution control equipment.
	DOT Rules for Hazardous Materials Transport (49 CFR 171)[3]	Applicable	Provides requirements for the transportation of hazardous waste.
	New Jersey Standards for the Design and Operation of Hazardous Waste Treatment Facilities (NJAC 7:26)	Relevant and Appropriate	This regulation outlines general waste facility requirements with regard to waste analysis, security measures, inspection and training requirements.

TABLE 7 (Cont'd)

ACTION-SPECIFIC ARARS

REGULATORY LEVEL	ARARS	STATUS	REGULATORY SYNPOSIS
	New Jersey Noise Pollution Regulations (NJAC 7:29)	Applicable	Provides standards for the control of noise pollution.
B. Standing Water and Sediment Treatment	NPDES Regulations (40 CFR 122)	Applicable	Provides regulations for discharge of the treatment system effluent. Refers to effluent limitations for discharge to surface water.
	New Jersey Pollution Discharge Elimination System Regulations NJAC (7:14A)	Applicable	Provides regulations for discharge of pollutants to surface water of the State.
C. Slag and Lead Oxide Materials, Debris and Contaminated Surfaces	RCRA Closure and Post-Closure Standards (40 CFR 264, Subpart G)	Relevant and Appropriate	This regulation details specific requirements for closure and post-closure of hazardous waste facilities.
	RCRA Subtitle D Nonhazardous Waste Management Standards (40 CFR 257)[2]	Applicable	Provides regulations for the management of non-hazardous waste.
	RCRA Land Disposal Restrictions (LDRs) (40 CFR 268)	Applicable	Regulates land disposal of hazardous waste. Provides treatment levels which must be met before land disposal of hazardous waste may occur.
	New Jersey RCRA Closure and Post-Closure Standards (NJAC 7:26)	Relevant and Appropriate	This regulation details specific requirements for closure and post-closure of hazardous waste facilities.
	New Jersey Standards for Generators of Hazardous Waste (NJAC 7:26)	Applicable	General Standards for generators of hazardous waste.
	New Jersey Air Pollution Control Requirements (NJAC 7:27)	Applicable	Provides guidelines for the control of Air contaminants.
	New Jersey Soil Erosion and Sediment Control Act Requirements[1]	Applicable	Provides guidelines for soil erosion and sediment control plans.

1) Applies to alternatives remediating slag and lead oxide materials only.

2) Applies to alternative which involve on-site disposal.

3) Applies to alternatives which involve off-site transportation

4) Applies to monitoring of ground and surface waters.

TABLE 6

CONTAMINANT-SPECIFIC ARARS, CRITERIA AND GUIDANCE

REGULATORY LEVEL	ARAR IDENTIFICATION	STATUS	REGULATORY SYNOPSIS	FS CONSIDERATION
Federal	CWA Water Quality Criteria (WQC) for protection of Human Health and Aquatic Life[2]	Relevant and Appropriate	Contaminant levels regulated by WQC are provided to protect human health in relation to exposure from drinking water and from consuming aquatic organisms (primarily fish).	WQC are relevant and appropriate to evaluation of surface water discharge acceptability.
Federal	RCRA Maximum Contaminant[1] Levels (MCLs)	To be Considered	Provides standards for 14 toxic compounds and pesticides for protection of groundwater. These standards are equal to the MCLs established by SDWA.	The promulgated values are included in the SDWA MCLs. The combined standards are compared with the maximum contaminant levels at the NL site to determine the level of contamination.
Federal	SDWA Maximum Contaminant[1] Levels (MCLs)	To be Considered	Provides standards for toxic compounds for public drinking water.	The promulgated values are used as standards to determine the level of treatment for groundwater discharge.
Federal	SDWA MCL Goals[1]	To Be Considered	EPA has promulgated contaminants levels and has proposed others for public water system. The MCLGs are health goals and are set at levels that would result in no known or anticipated adverse health effects with an adequate margin of safety.	MCLGs are used as reference values to indicate contaminant levels for the NL site.
Federal	RCRA Identification of Hazardous Waste (40 CFR 261)	Applicable	Provides regulations concerning identification and classification of RCRA Hazardous Waste.	Will be used to determine RCRA listed and characteristic waste present at the NL site.
Federal	RCRA Land Disposal Restriction (LDR) (40 CFR 268)	Applicable	Limits land disposal options and provides treatment standards for contaminants prior to disposal.	Treatment standards or BDAT requirements must be met prior to land disposal. Effective for CERCLA soil and debris as of November 1990.
Federal	National Ambient Air Quality Standards (NAAQS) (40 CFR 50)	Applicable	These standards provide acceptable limits for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead that must not be exceeded in ambient air.	Remediation technologies that could release contaminants into the air will be designed to meet these standards.
Federal	EPA Risk Reference Doses (RfDs)	To Be Considered	RfD's are considered to be the levels unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	EPA Reference Doses are used to characterize risk associated with non-carcinogens in various media.

TABLE 6 (Cont'd)

CONTAMINANT-SPECIFIC ARARS, CRITERIA AND GUIDANCE

REGULATORY LEVEL	ARAR IDENTIFICATION	STATUS	REGULATORY SYNOPSIS	FS CONSIDERATION
New Jersey	New Jersey Regulations for the Identification of Hazardous Waste (NJAC 7:26-8)	Applicable	Provides regulations concerning the identification and classification of Hazardous Waste	Will be used to determine listed and characteristic hazardous waste at the NL site.
New Jersey	New Jersey Groundwater Quality Standards [1]	To Be Considered	Provides quality standards for groundwater based on aquifer characteristics and use.	The levels will be compared to levels at the NL site to determine contaminant migration.
New Jersey	New Jersey Safe Drinking Water Act Maximum Contaminant Levels (MCL's) (NJAC 7:10-16) [1]	To Be Considered	Provides quality standards for drinking water.	These levels will be compared to contaminant levels at the NL site to determine contaminant migration.
New Jersey	New Jersey State Water Standards (NJAC 7:9-4) [2]	Relevant and Appropriate	Provides quality standards for surface water.	These standards will be used to determine appropriate levels for discharge to surface water.
New Jersey	New Jersey Ambient Air Quality Standards	Applicable	Provides guidance regarding air emissions.	Remedial activities which cause air emissions will conform to these standards.

1) Applies to alternatives including groundwater monitoring

2) Applies to standing water treatment alternatives

TABLE 4

Results of the Metals Analysis

of TCLP extracts

SLAG AND LEAD OXIDE PILES (1991)

Concentration reported in mg/L

Client #	C8794	C8795	C8796	C8797	C8798	C8799	Method	Regulatory
Location:	Lead Oxide A	Lead Oxide B	A Pile	B Pile	C Pile	D Pile	Detection Limit	Level
Parameter:								
Arsenic	ND	0.282	ND	ND	ND	ND	0.10	5.0
Barium	ND	0.199	ND	ND	ND	ND	0.10	100.0
Cadmium	24.1	26.3	1.4	1.6	5.3	0.69	0.10	1.0
Chromium	ND	ND	ND	ND	ND	ND	0.10	5.0
Lead	620	2750	8.0	4.9	5.1	4.5	0.10	5.0
Mercury	ND	ND	ND	ND	ND	ND	0.10	0.2
Selenium	ND	ND	ND	ND	ND	ND	0.10	1.0
Silver	ND	ND	ND	ND	ND	ND	0.10	5.0

ND denotes not detected

TABLE 5

Results of the Metals Analysis

STANDING WATER SAMPLES (1991)

Client#	A	B	C	D	E	F	G	H	DETECTION LIMIT
Location:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Unit:	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Parameter:									
Antimony	28	100	21	27	29	340	28	5U	5
Arsenic	5U	5U	5U	5U	5U	5U	5U	5U	5
Beryllium	50U	50U	50U	50U	50U	50U	50U	50U	50
Cadmium	200	560	160	61	340	67	200	25U	25
Chromium	50U	50U	50U	50U	50U	50U	50U	50U	50
Copper	460	49	310	50U	50U	50U	450	50U	50
Lead	5500	1300	4500	1100	970	1100	5400	50U	50
Mercury	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4
Nickel	180	100	140	50U	50U	50U	190	50U	50
Selenium	5	16	5U	5U	5U	23	5U	5U	5
Silver	25U	25U	25U	25U	25U	25U	25U	25U	25
Thallium	5U	5U	5U	5U	5U	5U	5U	5U	5
Zinc	3500	1400	2600	290	550	460	3500	25U	25

U - denotes detection limit

N/A - not available