Explanation of Significant Differences

Ruston Foundry Superfund Site

Alexandria, Louisiana

United States Environmental
Protection Agency
Region 6
Superfund Division

September 2004

CONCURRENCE PAGE FOR THE RUSTON FOUNDRY SUPERFUND SITE
EXPLANATION OF SIGNIFICANT DIFFERENCES

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I. Introduction

Site Name:	Ruston Foundry Superfund Site (LAD985185107)
Site Location:	Alexandria, Rapides Parish, Louisiana
Lead Agency:	U. S. Environmental Protection Agency, Region 6 (EPA)
Support Agency:	Louisiana Department of Environmental Quality (LDEQ)

This decision document presents the Explanation of Significant Differences (ESD) for the Ruston Foundry Superfund Site (Site), in Alexandria, Rapides Parish, Louisiana. The ESD is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300.435(c)(2)(i) and 300.825(a)(2). The Director of the Superfund Division has been delegated the authority to sign this ESD.

II. Statement of Purpose

The EPA is issuing this ESD for the Ruston Foundry Superfund Site (Site) to document post-Record of Decision (ROD) changes based on new information received from the city and the community during a meeting held on February 26, 2004, regarding future Site reuse and from Kansas City Southern Railway Company (KCS), the potentially responsible party (PRP), during negotiations regarding slag stabilization. This new information significantly changes a component of the selected remedy and adds a contingency remedy; however, it does not fundamentally alter the overall cleanup approach which is stabilization and offsite disposal unless the contingency remedy is implemented. Based on post-ROD discussions between the city and the community, the proposed future Site reuse has changed from recreational, as described in the 2002 ROD, to industrial. This change in land use required revisions to the risk assessment, which in turn revised the soil/sediment cleanup levels, the estimated waste volume to be addressed, and the estimated remedial costs. This change also requires future operation and maintenance (O&M) activities, Five-year Reviews, and Institutional Controls (ICs). These revisions decrease the volume of estimated soil/sediment waste from 15,000 cubic yards (yd^3) to 1,766 yd^3 and reduce the estimated cost of remedial action from $5,007,412 to $2,751,901. Post-ROD discussions with the PRP have indicated that the use of stabilization may not be the most efficient and cost effective method for addressing the slag waste; therefore, a contingency remedy, excavation and offsite disposal, is added to the overall remedial approach and was selected from the alternatives commented on and presented in the 2002 Proposed Plan. If the contingency remedy is implemented, the revised cost estimate would decrease from $5,007,412 to $3,035,002. The cost difference for the contingency is due to the disposal of untreated hazardous waste which is more costly.

III. Site History

The Ruston Foundry Site is an abandoned metal foundry that operated from 1908 until 1985 and is located in an urban area with mixed development within the city limits of Alexandria, Louisiana. The nearest resident is located approximately 80 feet northwest of the Site and approximately 6,000 residents are located within a one-mile radius of the Site. There is a recreational park located approximately 1/4-mile southeast of the Site, and schools identified within one mile of the Site include Peabody Elementary, Peabody Magnet, Jones Street Junior High, Bolton High, South Alexandria Sixth Grade School, and Alma Redwine Primary School.

The Site is 6.6 acres consisting primarily of dilapidated structures and building foundations overgrown with thick brush. The Site is bordered by a series of abandoned railroad tracks to the west, Chatlin Lake Canal to the northeast and east, and Mill Street Ditch to the south and southeast. A 1.62-acre portion of the Site is located just south of Mill Street Ditch (Figure 1). Residential property is located to the north, south, and east of the Site. Historical and active industrialized areas lie further west and north of the Site.

Foundry operations resulted in metals contaminated waste which was dispersed throughout the property as fill material. As a result of this disposal activity, foundry-derived process wastes (slag, foundry sand piles, metal scrap, and castings) cover most of the Site and have contaminated the soil (Figures 2 and 3).

During the 1990s, LDEQ and EPA conducted a series of Site investigations. On January 19, 1999, the Site was proposed to the National Priorities List (NPL), and on May 10, 1999, EPA formally announced the addition of the Site to the NPL in the Federal Register.

IV. Selected Remedy

After review and response to comments, the Record of Decision was signed on June 24, 2002. The Remedial Action Objectives (RAOs) for the Site were to:

Media of Interest	Remedial Action Objectives (2002 ROD)
Surface Soil and Sediment	RAO No. 1 - Prevent direct human contact (trespassers, adult recreators, and child recreators) with surface soils and waste piles containing lead at concentrations that would result in a greater than 5 percent chance that a child's blood lead value would exceed 10 micrograms per deciliter. RAO No. 2 - Prevent direct human contact (trespassers, adult recreators, and child recreators) with surface soils and waste piles containing antimony at concentrations which have a hazard index greater than 1. RAO No. 3 - Prevent leaching and migration of lead from surface soils and waste piles into the ground water at concentrations exceeding 0.015 milligrams per liter. RAO No. 4 - Prevent leaching and migration of antimony from surface soils and waste piles into the ground water at concentrations exceeding 0.006 milligrams per liter.
Other Media	RAO No. 5 - Prevent direct human contact with asbestos containing material at concentrations greater than 1 percent by weight. RAO No. 6 - Prevent direct contact with the underground storage tank, its contents, and surrounding contaminated soils. RAO No. 7 - Prevent direct human contact (trespassers, adult recreators, and child recreators) with slag pile material with toxicity characteristic leaching procedure lead concentrations greater than 5 milligrams per liter and handle as hazardous waste in accordance with all applicable federal, state, and local regulations. RAO No. 8 - Prevent migration of contaminants to deeper soils and ground water through the former onsite water supply well and from the existing buildings, slabs, sump, and trash.

Because there are no Federal or State cleanup standards for soil contamination, the EPA established the RAO cleanup levels (CLs) based on the baseline human health risk assessment. The selected CLs will reduce the excess noncancer risk associated with exposure to contaminated wastes, the excess risk of exceeding 10 micrograms per deciliter blood lead level, and the potential for migration of contaminants into the ground water.

This will be achieved by:

- reducing the concentrations of the soil contaminated with antimony to 150 milligrams per kilogram (mg/kg) and/or less than the Louisiana Synthetic Precipitation Leachate Procedure (LA SPLP);
- reducing the concentrations of the soil contaminated with lead to 500 mg/kg and/or less than the LA SPLP;
- removing Asbestos Containing Material and disposing of waste offsite;
- removing the Underground Storage Tank, its contents and surrounding Polychlorinated Biphenols soils and disposing of waste offsite;
- abandoning the onsite water supply well and disposing of building debris offsite; and,
- stabilization of hazardous waste and disposing of the waste offsite.

The major components of the original remedy.

1. Stabilization - Approximately 1,300 cubic yards (yd^3) of hazardous waste will be excavated and stabilized. The material will be stabilized until sampling verifies that it no longer exceeds the Toxicity Characteristic Leaching Procedure (TCLP) for lead. After verification, the waste will be disposed offsite at a Resource Conservation and Recovery Act (RCRA) regulated Subtitle D facility.

2. Asbestos Containing Material (ACM) - Materials will be consolidated onsite, contained, and transported offsite to a disposal facility licensed to accept ACM. Methods to control airborne dispersion of asbestos will be implemented during remediation. The estimated total volume of material is 22 yd^3.

3. Underground Storage Tank (UST) - The UST, its contents, and the surrounding petroleum wastes will be characterized during the remedial design to determine whether the contents will be cleaned up under CERCLA or Oil Pollution Act (OPA) authority. The surrounding polychlorinated byphenol (PCB) contaminated soils will be removed and disposed offsite in accordance with all federal, state, and local regulations. Total volume of tank contents is estimated at 5,000 gallons. The volume of associated contaminated soil is included in the soil/sediment estimated volume of 15,000 yd^3.

4. Building debris and water supply well - The onsite well will be plugged and abandoned in accordance with all federal, state, and local regulations. Portions of the Site will be cleared, where necessary, and the existing buildings and foundations will be demolished, removed and disposed offsite.

5. Soil/sediment - Approximately 15,000 yd^3 of lead and antimony contaminated soils and sediment will be excavated and disposed offsite in a RCRA Subtitle D facility.

6. Air Monitoring - During remedial action, efforts will be made to control dust and run-off to limit the amount of materials that may migrate to a potential receptor. Air monitoring will be conducted during times of remediation to ensure that control measures are working to regulate Site emissions.

7. Short-term monitoring - Monitoring of the surface water and ground water during remedial action may be necessary to ensure that runoff control measures are working.

V. Basis for the Document

Post-ROD discussions between the city and the community resulted in changing the proposed future Site reuse from recreational to industrial. This change in land use required revisions to the baseline human health risk assessment (BHHRA), which in turn revised the soil/sediment cleanup levels, the estimated waste volume to be addressed, and the estimated remedial costs.

Post-ROD negotiations between EPA and KCS have raised questions concerning the efficiency and cost effectiveness of slag stabilization. The slag ranges from tennis ball to bowling ball in size and is estimated to be 1,300 yd^3. In order to stabilize the material, it will need to be crushed in order to increase the surface area and make the lead more readily available to the stabilizing agent. During the implementation of the treatability evaluation, the stabilization process will be evaluated to determine its efficiency and cost effectiveness as compared to the contingency remedy. The contingency remedy is Excavation and Offsite Disposal and was chosen from the alternatives commented on and presented in the Proposed Plan. The final remedial process will be based upon the results of the treatability evaluation.

This new information significantly changes a component of the selected remedy; however, it does not fundamentally alter the overall cleanup approach which is stabilization and offsite disposal unless the contingency remedy is implemented. This change will also require future operation and maintenance (O&M) activities, Five-year Reviews, and Institutional Controls (ICs).

<u>Revised Risk Assessment</u>
Because the future Site reuse changed, the BHHRA was revised to evaluate potential risk associated with Site specific wastes based on an industrial scenario rather than the previously used recreational scenario (Appendix A). The same data and major chemicals of potential concern (COPCs) used in the BHHRA are used in the revised risk assessment. The COPCs are lead, antimony, polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Because soil was the only medium that posed potential risk, the revised risk assessment will only develop risk related to a worker exposed to soil contaminated with the above mentioned COPCs. The revised risk assessment incorporates the exposure points [surface soil (0 - 3 inches), surface soil (hot spots), and surface soil (slag piles)] and the exposure routes (inhalation, dermal, and ingestion) identified in the BHHRA. The exposure point concentration of each chemical was calculated as the 95% upper confidence level on the arithmetic mean or the maximum detected value which ever is lower, and the EPA recommended reasonable maximum exposure (RME) default values for a worker exposure scenario were used. As such, the potentially exposed population is expected to be workers in light commercial/industry type of work; therefore, an indoor worker scenario is assumed. To evaluate risk from exposure to lead in soil, the adult non-residential population is assumed to be women workers of child-bearing age. The methodology and goal applied are for the protection of fetuses carried by women who experience nonresidential exposures such that the developing fetus would have a chance of no more than 5% exceeding the EPA and Centers for Disease Control and Prevention acceptable blood lead level of 10 micrograms per deciliter.

The revised risk assessment determined that carcinogenic risks under an industrial scenario are within the U.S. EPA generally accepted cancer risk range of one in ten thousand to one in a million (1 x 10-4 to 1 x 10-6). However, the revised assessment determined that potential non-cancer risk for the industrial scenario exists for the hot spot areas primarily due to the presence of antimony. The evaluation of exposure to lead was found to exceed the recommended level that no more than 5% exceed the blood lead level of 10 micrograms per deciliter.

VI. Description of Significant Differences

The EPA is issuing this ESD to document post-Record of Decision (ROD) changes based on new information received from the city, the community, and the PRP. The table below lists only those components effected by these changes. All other components of the original selected remedy remain unchanged.

Component	2002 ROD	ESD	Difference
Remedial Approach	Stabilization and Offsite Disposal	Stabilization and Offsite Disposal with Excavation and Offsite Disposal Contingency for the Hazardous Waste	Addition of the Excavation and Offsite Disposal Contingency for the Hazardous Waste
Soil Cleanup Levels	500 mg/kg lead 150 mg/kg antimony	1400 mg/kg lead 820 mg/kg antimony	Recreational Scenario verses Industrial Scenario
Soil/sediment Volume	15,000 yd^3	1,766 yd^3	13,234 yd^3 decrease
O&M and ICs (present value cost estimated for 30 year time period)	No Cost	$397,299	$397,299 increase
Five-year Reviews (present value cost estimated for 30 year time period)	No Cost	$43,497	$43,497 increase
Remedial Cost Stabilization (1,300 yd^3 hazardous waste) and Offsite Disposal	$5,007,412	$2,751,901	$2,255,511 decrease
Excavation and Offsite Disposal		$3,035,002	$1,972,410 decrease

Contingency Remedy 1,300 yd^3 hazardous waste: Cost of Excavation and Offsite Disposal verses Stabilization and Disposal	Stabilization and Disposal $510,380	Excavation and Disposal $700,700	$190,320 increase

Cleanup Levels

Lead and Antimony

The cleanup levels (CLs) in the 2002 ROD were established to address potential risks associated with a recreational scenario involving adults and children. The antimony and lead CLs were 150 milligrams per kilogram (mg/kg) and 500 mg/kg, respectively. Under the industrial scenario, risks are based on an adult worker and a pregnant woman worker (Appendix A). The CLs for the industrial scenario are 820 mg/kg for antimony and 1400 mg/kg for lead (Figure 4).

Synthetic Precipitation Leaching Procedure (SPLP) Criteria

During the remedial investigation, 42 samples were analyzed using the synthetic precipitation leaching procedure (SPLP) as described in the Louisiana Risk Evaluation/Corrective Action Program (RECAP, October 20, 2003). The results were compared to the SPLP screening values that are protective of ground water. The results for lead and antimony were found to exceed the screening values and were therefore included in the 2002 ROD and the Public Comment ESD as areas requiring remediation. Upon further review, LDEQ applied the procedure for determining a site-specific cleanup value for soil removal based upon a threat to ground water quality provided in Appendix H of RECAP. By applying this methodology, site-specific SPLP cleanup values for soil needing removal based upon a threat to ground water were calculated. The site-specific SPLP cleanup value protective of ground water for lead was calculated to be 8.7 milligrams per liter (mg/L) and for antimony was calculated to be 3.5 mg/L (Appendix B). The maximum Ruston SPLP sample values for lead and antimony are 1.81 mg/L and .679 mg/L, respectively. Based on this evaluation, there are no Ruston SPLP sample locations that exceed the calculated ground water protectiveness cleanup values for lead or antimony.

Volume

The soil volume estimated in the 2002 ROD was based on the 150 mg/kg antimony and 500 mg/kg lead CLs as well as the exceedances of the synthetic precipitation leachate procedure (SPLP) screening values. The volume of soil exceeding both SPLP and the CLs was estimated to be 15,000 yd^3. With a change in CLs and SPLP cleanup values, there is a change in the estimated soil volume (Appendix C). The estimated volume of soil exceeding the 820 mg/kg antimony and 1400 mg/kg lead CLs is 1,766 yd^3.

Cost

The estimated remedial cost is based on the volume of waste that needs to be addressed. Because the volume of waste requiring excavation and removal decreased, the cost for this activity also decreased. The estimated cost associated with excavation and disposal of 1,766 yd^3 is $326,372 which is much less than the $2,436,600 estimated in the 2002 ROD for excavation and disposal of 15,000 yd^3 (Appendix D).

Because waste will be left onsite above levels that allow for unlimited use and unrestricted exposure, future O&M activities, Five-year Reviews, Institutional Controls (ICs), and additional associated costs will become part of the revised remedy. Annual O&M activities will include, but are not limited to, Site inspection and maintenance, IC inspection and enforcement, and Site reports. Reviews of the remedy will be conducted no less than every five years to ensure that the remedy is functioning as designed, and remains protective of human health and the environment. The purpose of the IC is to ensure that the property remains zoned industrial and is only used for that purpose (Appendix E). A conveyance notice will be filed with the property deed describing the Site conditions and the land use restrictions to control exposure to contamination left onsite. The restrictions would prohibit any unauthorized excavation or use of contaminated soil and limit future use of the property to industrial purposes. Enforcement of the IC will be the responsibility of the State and the local governing authorities. Costs (Appendix D) associated with these future activities will be incurred for as long as the waste remains on the site above levels that allow for unlimited use and unrestricted exposure. For cost estimation purposes, a 30 year period was used. The associated present worth costs are $397,299 for the O&M and ICs and $43,497 for the Five Year Reviews.

Contingency Remedy

The contingency remedy is Excavation and Offsite disposal which was presented in the 2002 Proposed Plan as Alternative 5. Costs associated with the contingency remedy are related to excavation activities and disposal of 1,300 yd^3 of hazardous waste in a Resource Conservation and Recovery Act (RCRA) hazardous waste landfill (Appendix D). This differs from the stabilization process in that the wastes will not be treated prior to transportation and disposal and will not be disposed of in a RCRA solid waste landfill. Should it be determined through the treatability evaluation that excavation and offsite disposal proves to be the more appropriate method of addressing the hazardous waste, then stabilization will no longer be required. Implementation of the contingency remedy will be documented through a second ESD. The contingency remedy cost for excavation is $13,000 and the cost for transportation and disposal is $687,700 for a total of $700,700.

RAOs

The selected CLs will reduce the potential noncancer risks associated with worker exposure to contaminated wastes and the excess risk of a fetus exceeding 10 micrograms per deciliter blood lead level. The revised RAOs are listed in the following table.

Media of Interest	Remedial Action Objectives (2004 ESD)
Surface Soil and Sediment	RAO No. 1 - Prevent direct human contact (pregnant adult woman worker) with surface soils and waste piles containing lead at concentrations that would result in a greater than 5 percent chance that a fetus's blood lead value would exceed 10 micrograms per deciliter. RAO No. 2 - Prevent direct human contact (adult workers) with surface soils containing antimony at concentrations which have a hazard index greater than 1.
Other Media	RAO No. 3 - Prevent direct human contact with asbestos containing material at concentrations greater than 1 percent by weight. RAO No. 4 - Prevent direct contact with the underground storage tank, its contents, and surrounding contaminated soils. RAO No. 5 - Prevent direct human contact (pregnant adult woman worker and adult workers) with slag pile material with toxicity characteristic leaching procedure lead concentrations greater than 5 milligrams per liter and handle as hazardous waste in accordance with all applicable federal, state, and local regulations. RAO No. 6 - Prevent migration of contaminants to deeper soils and ground water through the former onsite water supply well and from the existing buildings, slabs, sump, and trash.

VII. Support Agency Comments

The LDEQ has been consulted and provided the opportunity to comment on this ESD in accordance with the NCP §§ 300.435 (c)(2) and 300.435 (c)(2)(i) and CERCLA § 121 (f). The LDEQ supports the changes in the selected remedy to better reflect the future industrial use of the Site (Appendix F).

VIII. Statutory Determinations

The EPA has determined that these significant changes comply with the statutory requirements of CERCLA § 121, 42 U.S.C. § 9621, are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment). The hazardous wastes will be excavated, stabilized, and disposed offsite. Should the contingency remedy be used to address the hazardous waste, the statutory preference for treatment will not be met.

IX. Public Participation

This ESD will become part of the Administrative Record (NCP 300.825(a)(2)), which has been developed in accordance with Section 113 (k) of CERCLA, 42 U.S.C. § 9613 (k), and which is available for review at the Rapides Parish Public Library, 411 Washington Street, Alexandria, Louisiana, 71301, Monday-Thursday 9 a.m. to 8 p.m. and Friday-Saturday 9 a.m. to 6 p.m.; Louisiana Department of Environmental Quality, Public Records Center, Galvez Building Room 127, 602 N. Fifth Street, Baton Rouge, Louisiana, 70802, Monday - Friday, 8:00 a.m. to 4:30 p.m.; and, United States Environmental Protection Agency, Region 6, 12th Floor Library, 1445 Ross Avenue, Dallas, Texas, 75202, Monday - Friday, 7:30 a.m. to 4:30 p.m. As required by NCP § 300.435(c)(2)(i)(B), a Notice of Availability and a brief description of the ESD was published in the local paper on July 27, 2004. A public meeting was held on August 10, 2004, from 6:30 p.m. until 8:30 p.m. at the Broadway Resource Center located at 712 Broadway. Responses to comments received during the July 28 through August 31, 2004, comment period are presented in Appendix G.

X. Revisions not included in the ESD presented for Public Comment

Synthetic Precipitation Leaching Procedure (SPLP)

Site SPLP sample results were further analyzed using the Louisiana Risk Evaluation/Corrective Action Program (RECAP, October 20, 2003). Upon further review, LDEQ applied the procedure for determining a site-specific cleanup value for soil removal based upon a threat to ground water quality provided in Appendix H of RECAP (see Section VI and Appendix B). The site-specific SPLP cleanup value protective of ground water for lead was calculated to be 8.7 mg/L and for antimony was calculated to be 3.5 mg/L (Appendix B). Based on this evaluation, there are no Ruston SPLP sample locations that exceed ground water protectiveness criteria. This resulted in minor revisions to the total volume of soil that will be remediated, to the overall remediation cost, to the final list of RAOs, and to the remediation figure that were presented in the Public Comment ESD. Although this discussion was not presented in the text of the Public Comment ESD, it was presented to the community during the Public Meeting held on August 10, 2004.

Ground Water Monitoring

The Public Comment ESD indicated that the ground water would continue to be monitored during the O&M period. Because Site soils do not exceed the site-specific SPLP cleanup value protective of ground water and the risk assessment determined that no complete exposure pathway exists, the ground water will not be monitored and the existing wells will be plugged and abandoned according to LDEQ requirements. Although this discussion was not presented in the text of the Public Comment ESD, it was presented to the community during the Public Meeting held on August 10, 2004.

XI. Authorizing Signatures

This ESD documents the significant changes related to the remedy at the Ruston Foundry Site. These changes were selected by EPA with the concurrence of the Louisiana Department of Environmental Quality.

U.S. Environmental Protection Agency

By: ____________________________ Date: ____________________

Samuel Coleman, P.E.
Director
Superfund Division

XI. Authorizing Signatures

This ESD documents the significant changes related to the remedy at the Ruston Foundry Site. These changes were selected by EPA with the concurrence of the Louisiana Department of Environmental Quality.

U.S. Environmental Protection Agency

By: Pamela Phillips, Acting Date: 9/28/2004

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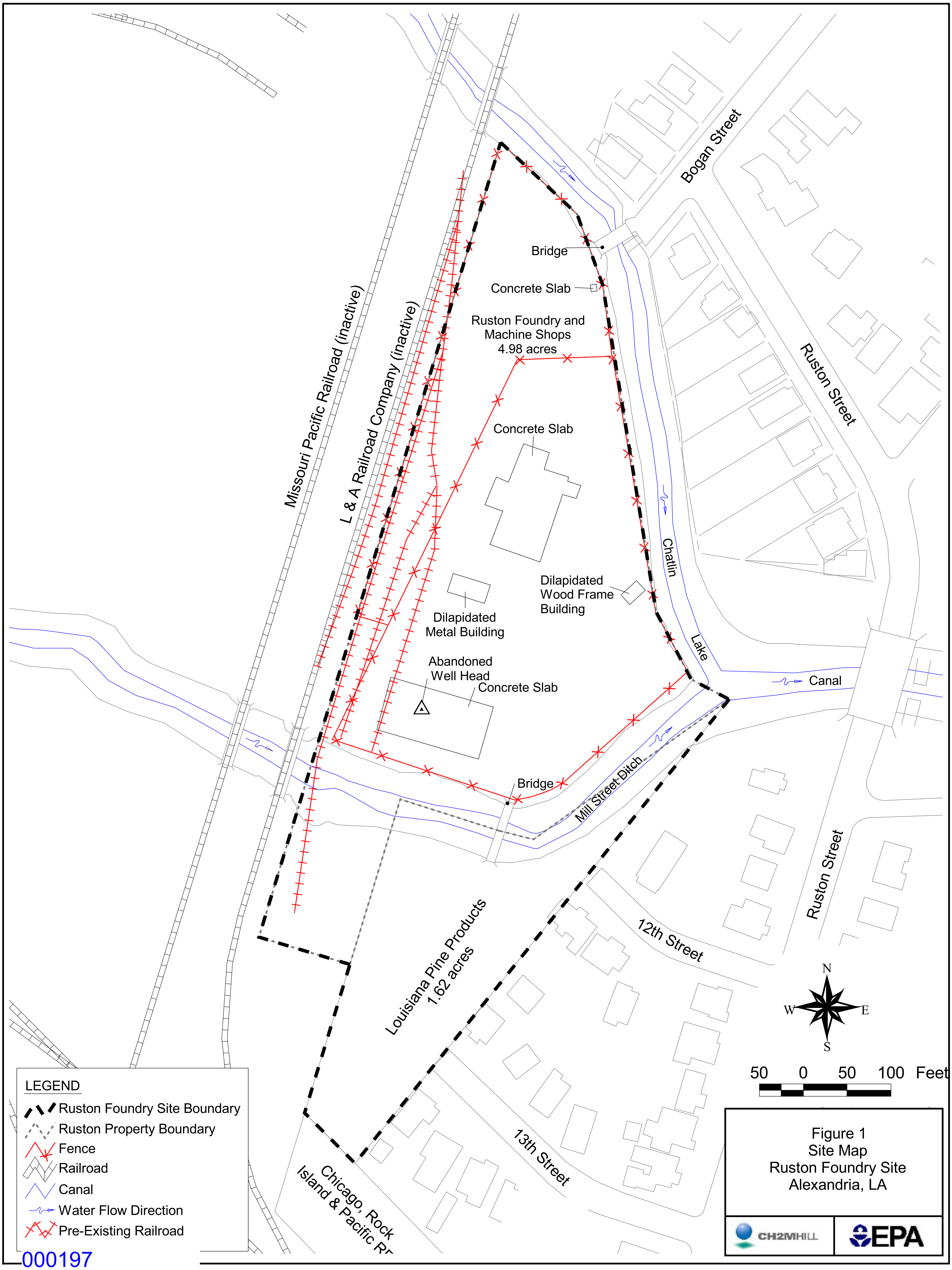
Superfund Division

Figure 1
Site Map for Ruston Foundry


Missouri Pacific Railroad (inactive)
L & A Railroad Company (inactive)
Bogan Street
Ruston Street
Bridge
Concrete Slab
Ruston Foundry and
Machine Shops
4.98 acres
Concrete Slab
Dilapidated
Wood Frame
Building
Dilapidated
Metal Building
Abandoned
Well Head
Concrete Slab
Chatlin
Lake
Canal
Bridge
Mill Street Ditch
Louisiana Pine Products
1.62 acres
12th Street
Ruston Street
13th Street
Chicago, Rock
Island & Pacific RR
N
W
E
S
50
0
50
100
Feet
LEGEND
Ruston Foundry Site Boundary
Ruston Property Boundary
Fence
Railroad
Canal
Water Flow Direction
Pre-Existing Railroad
Figure 1
Site Map
Ruston Foundry Site
Alexandria, LA
CH2MHILL
EPA

000197

Figure 2
Lead and Antimony Sample Locations

Lead and Antimony Locations

000199

Figure 3
SPLP, UST and Foundry Waste Locations

Sample Locations: SPLP, UST, and Foundry Material

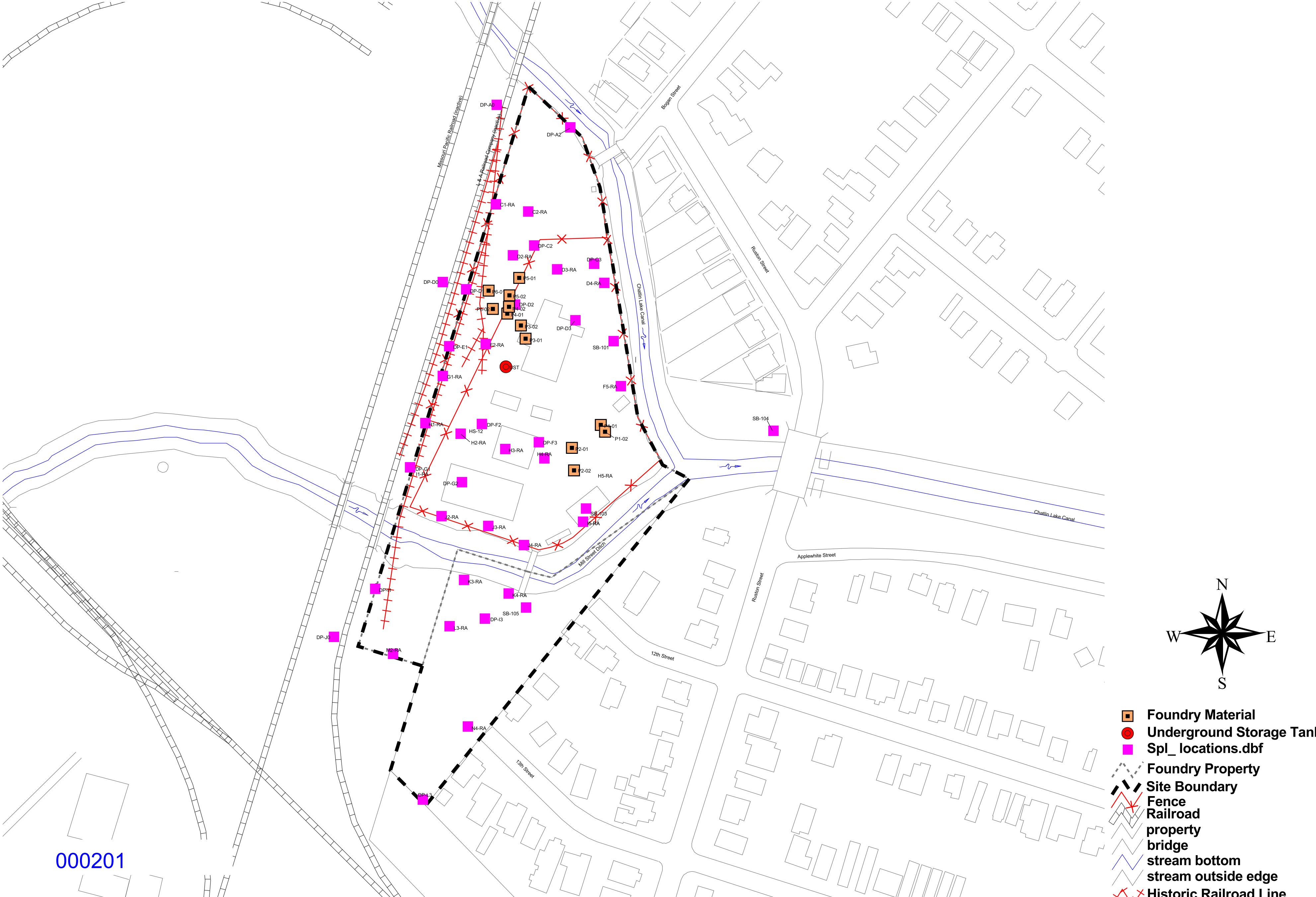


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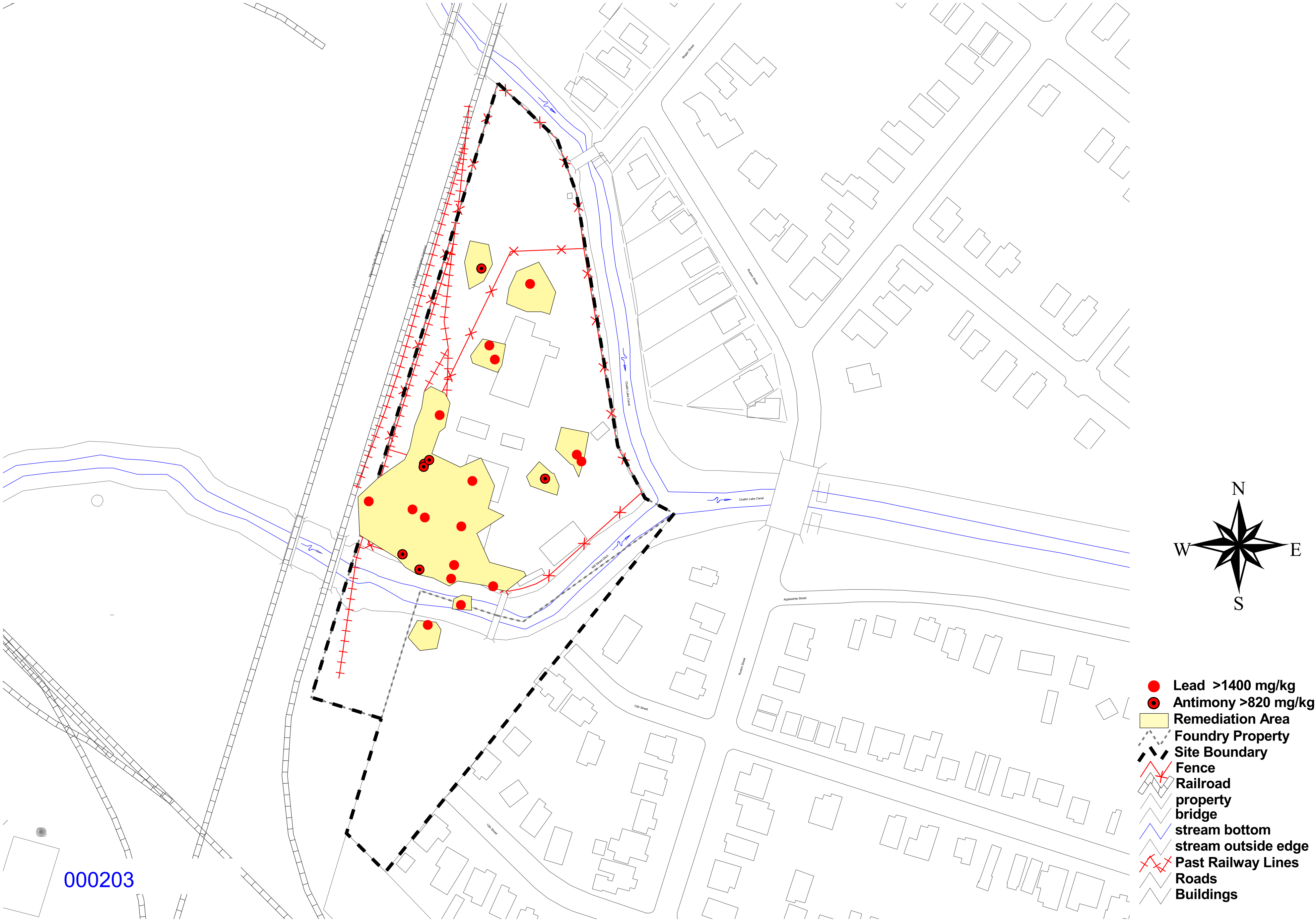
Figure 4
Remediation Area

Remediation Area



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Appendix A
Revised Risk Assessment for Ruston Foundry

MEMORANDUM

May 06, 2004

SUBJECT: Human Health Risk Assessment Using a Commercial/Industrial Worker Scenario for Ruston Foundry Superfund Site.

FROM: Ghassan A. Khoury, M.S.P.H., Sc.D.
Toxicologist
Superfund Technical Support Team (6SF-LT)

TO: Katrina Coltrain, RPM
Superfund Branch (6 SF- LP)

This risk assessment is an addendum to the final baseline human health risk assessment that was prepared for the site on March 2002. The future land use for the site was proposed to be a recreational park. However since then, the land use was changed to accommodate developing plans for the site to become light commercial. As such, this addendum is prepared to take into consideration an industrial/commercial adult worker exposure to contaminated onsite soil. The same data that were used for the baseline risk assessment are used here for the commercial/industrial scenario. Refer to tables 3, 4 and 5 for a summary of the risks.

The following soil samples will be used in the risk assessment:

- Grid Soil - Fifty-six soil samples were collected from the zero to 3-inch interval on a 75-foot grid across the site and analyzed for target analyte list (TAL) metals. Eighteen selected soil samples from the zero to one foot interval were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). For the purpose of this risk assessment, only polynuclear aromatic hydrcarbons (PAHs) and PCBs were included.
- Canal Transect Soil- Twelve soil samples were collected along the banks of Chatlin Lake Canal and Mill Street Ditch (i.e., a total of 24 samples); samples were collected from the zero to 3-inch interval and analyzed for TAL metals.
- Slag Pile Soil - 23 soil samples were collected in six on-site slag piles; samples were collected from multiple depths within and below each pile and analyzed for TAL metals.
- Hot Spot Soil- soil samples were collected from areas of suspected higher concentrations based on historical information and findings made during the Remedial Investigation (RI) activities; samples were collected from the zero to 3-inch interval and analyzed for TAL metals (4 samples) depending on the characteristics of the potential source area.

Chemicals of Potential Concern:

The major chemicals that were identified in the baseline human health risk assessment will be evaluated here only. The chemicals of potential concern (COPC) were lead, antimony, PAHs and PCBs. This risk assessment will only develop the risk to a worker exposed to soil contaminated with the above mentioned chemicals of concern.

Exposure Assessment:

Potentially Exposed Population:

The future land use was identified to be light commercial/industrial. As such the potential exposed population is expected to be workers in light commercial /industry type of work. An indoor worker scenario is assumed here, where an adult worker is routinely exposed to contaminated media, although intensive exposure is not expected based on day to day work activities. Exposure is generally assumed to be for a typical workday, but continues for the duration of employment, which can be substantial.

The adult non-residential population for evaluating risk from exposure to lead in soil is assumed to be women workers of child-bearing age. The methodology and goal applied are for the protection of fetuses carried by women who experience nonresidential exposures.

Potential Exposure Points:

- Surface Soil: Onsite soil (including soil along canal transects) was identified as an exposure point to workers. Surface soil from zero to 3 inches were sampled for metals and data used in this risk assessment. Concentrations of chemicals were higher at the top surface soil than deeper soil. Samples from zero to one foot intervals were sampled for chemicals other than metals. These data were used to evaluate risk from exposure to PAHs and PCBs.

- Surface Soil (Hot Spots): A few areas of onsite soil were expected to exhibit relatively high concentrations based on site history of activities. These areas were identified as hot spots and evaluated separately from other surface soils.

- Surface Soil (Slag Piles): Six slag piles were identified as exposure points. A separate exposure evaluation was also conducted for this group of samples.

Exposure Pathway Analysis:

A pathway is considered complete if the following exposure conditions are met:

1. A potential source or potential chemical release from a source
2. An exposure point where contact can occur
3. A receptor at the exposure point
4. An exposure route by which contact can occur (e.g. ingestion)

An adult worker is assumed to come in contact with contaminants in surface soil through the ingestion, dermal or inhalation routes of intake. The contaminants are also assumed to be transported as dust from outside sources to indoor environments.

Quantification of Exposure:

A future potential adult worker is identified as a possible receptor through the ingestion, dermal or inhalation routes of intake of site related contaminants in soil/canal transects, hot spots and slag piles.

The exposure point concentration of each chemical was calculated as the 95% upper confidence level on the arithmetic mean or the maximum detected value which ever is lower. The EPA recommended reasonable maximum exposure (RME) default values for a worker exposure scenario were used. (see table 1.0 for equations and parameter values used in the calculations).

Table 1.0

VALUES USED FOR DAILY INTAKE CALCULATIONS

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Surface Soil
Exposure Point:	On-Site
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Exposure Route	Parameter Variable	Units	RME Value	Intake Equation/Model Name
Ingestion	Chemical Conc. in soil (Cs)	mg/kg	----	Chronic Daily Intake (CDI) (mg/kg-day) = Cs x FI x IR x EF x ED x CF x 1/BW x 1/AT
	Ingestion Rate of Soil (IR)	mg/day	50	
	Fraction Ingested (FI)	unitless	1	
	Exposure Frequency (EF)	days/year	250	
	Exposure Duration (ED)	years	25	
	Conversion Factor (CF)	kg/mg	1E-06	
	Body Weight (BW)	kg	70	
	Averaging Time (Cancer) AT_C	days	25550	
	Averaging Time (Non-Cancer) AT_N	days	9125	
Dermal	Chemical Conc. in soil (Cs)	mg/kg	----	Chronic Daily Intake (CDI)(mg/kg-day) = Cs x SA x AF x ABS x EF x ED x CF x 1/BW x 1/AT
	Skin Surface Area (SA)	cm^2	5700	
	Skin Adherence Factor (AF)	mg/cm^2	0.07	
	Absorption Constant (ABS)	unitless	0.01	
	Exposure Frequency (EF)	days/year	250	
	Exposure Duration (ED)	years	25	
	Conversion Factor (CF)	kg/mg	1E-06	
	Body Weight (BW)	kg	70	
	Averaging Time (Cancer) AT_C	days	25550	
	Averaging Time (Non-Cancer) AT_N	days	9125	
Inhalation	Chemical Conc. in soil (Cs)	mg/kg	-----	Chronic Daily Intake (CDI)(mg/kg-day) = Cs x IR_Inh x 1/PEF x EF x ED x 1/BW x 1/AT
	Inhalation Rate (IR_inh)	m^3/day	20	
	Particulate Emission Factor (PEF)	m^3/kg	1.32E+09	
	Exposure Frequency (EF)	days/year	250	
	Exposure Duration (ED)	years	25	
	Body Weight (BW)	kg	70	
	Averaging Time (Cancer) AT_C	days	25550	
	Averaging Time (Non-Cancer) AT_N	days	9125	

Notes: RME = Reasonable Maximum Exposure

Approach For Lead Exposure

The U.S.EPA recommended approach for assessing nonresidential adult risks utilizes a methodology to relate soil lead intake to blood lead concentrations in women of child-bearing age. The basis for the calculation of the blood lead concentration in women of child-bearing age is the algorithm given by Equation 1:

$$PbB_{adult,central} = PbB_{adult,0} + \frac{PbS \cdot BKSF \cdot IR_S \cdot AF_S \cdot EF_S}{AT} \qquad \text{(Equation 1)}$$

where:

$PbB_{adult,\ central}$	=	Central estimate of blood lead concentrations (µg/dL) in adults (i.e., women of child-bearing age) that have site exposures to soil lead at concentration, PbS.
$PbB_{adult,\ 0}$	=	Typical blood lead concentration (µg/dL) in adults (i.e., women of child-bearing age) in the absence of exposures to the site that is being assessed.
PbS	=	Soil lead concentration (µg/g) (appropriate average concentration for individual).
BKSF	=	Biokinetic slope factor relating (quasi-steady state) increase in typical adult blood lead concentration to average daily lead uptake (µg/dL blood lead increase per µg/day lead uptake).
IR_S	=	Intake rate of soil, including both outdoor soil and indoor soil-derived dust (g/day).
AF_S	=	Absolute gastrointestinal absorption fraction for ingested lead in soil and lead in dust derived from soil (dimensionless).
EF_S	=	Exposure frequency for contact with assessed soils and/or dust derived in part from these soils (days of exposure during the averaging period); may be taken as days per year for continuing, long term exposure.
AT	=	Averaging time; the total period during which soil contact may occur; 365 days/year for continuing long term exposures.

The basis for the RBRG calculation is the relationship between the soil lead concentration and the blood lead concentration in the developing fetus of adult women that have site exposures. As a health-based goal, EPA has sought to limit the risk to young children of having elevated blood lead concentrations. Current Office of Solid Waste and Emergency Response (OSWER) guidance calls for the establishment of cleanup goals to limit childhood risk of exceeding 10 µg/dL to 5%. Equation 2 describes the estimated relationship between the blood lead concentration in adult women and the corresponding 95th percentile fetal blood lead concentration ($PbB_{fetal,\ 0.95}$), assuming that $PbB_{adult,\ central}$ reflects the geometric mean of a lognormal distribution of blood lead concentrations in women of child-bearing age. If a similar 95th percentile goal is applied to the protection of fetuses carried by women who experience nonresidential exposures, Equation 2 can be rearranged to reflect a risk-based goal for the central estimate of blood lead concentrations in adult women using Equation 3:

$$PbB_{fetal,0.95} = PbB_{adult,central} \cdot GSD_{i,adult}^{1.645} \cdot R_{fetal/maternal} \qquad \text{(Equation 2)}$$

$$PbB_{adult,central,goal} = \frac{PbB_{fetal,0.95,goal}}{GSD_{i,adult}^{1.645} \cdot R_{fetal/maternal}} \qquad \text{(Equation 3)}$$

where:

$PbB_{adult,\ central,\ goal}$ = Goal for central estimate of blood lead concentration (µg/dL) in adults (i.e., women of child-bearing age) that have site exposures. The goal is intended to ensure that $PbB_{fetal,\ 0.95,\ goal}$ does not exceed 10 µg/dL.

$PbB_{fetal,\ 0.95,\ goal}$ = Goal for the 95th percentile blood lead concentration (µg/dL) among fetuses born to women having exposures to the specified site soil concentration. This is interpreted to mean that there is a 95% likelihood that a fetus, in a woman who experiences such exposures, would have a blood lead concentration no greater than $PbB_{fetal,\ 0.95,\ goal}$ (i.e., the likelihood of a blood lead concentration greater than 10 µg/dL would be less than 5%,for the approach described in this report).

$GSD_{i,\ adult}$ = Estimated value of the individual geometric standard deviation (dimensionless); the GSD among adults (i.e., women of child-bearing age) that have exposures to similar on-site lead concentrations, but that have non-uniform response (intake, biokinetics) to site lead and non-uniform off-site lead exposures. The exponent, 1.645, is the value of the standard normal deviate used to calculate the 95th percentile from a lognormal distribution of blood lead concentration.

$R_{fetal/maternal}$ = Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (dimensionless).

The soil lead concentration associated with a given exposure scenario and $PbB_{adult, central, goal}$ can be calculated by rearranging Equation 1 and substituting $PbB_{adult, central, goal}$ for $PbB_{adult, central}$:

$$RBRG = PbS = \frac{(PbB_{adult, central, goal} - PbB_{adult, 0}) \cdot AT}{(BKSF \cdot IR_S \cdot AF_S \cdot EF_S)} \qquad \text{(Equation 4)}$$

It is this form of the algorithm that can be used to calculate a RBRG where the RBRG represents the soil lead concentration (PbS) that would be expected to result in a specified adult blood lead concentration ($PbB_{adult, central, goal}$) and corresponding 95th percentile fetal blood lead concentration ($PbB_{fetal, 0.95, goal}$).

Equations 1-4 are based on the following assumptions:

1. Blood lead concentrations for exposed adults can be estimated as the sum of an expected starting blood lead concentration in the absence of site exposure ($PbB_{adult, 0}$) and an expected site-related increase.

2. The site-related increase in blood lead concentrations can be estimated using a linear biokinetic slope factor (BKSF) which is multiplied by the estimated lead uptake.

3. Lead uptake can be related to soil lead levels using the estimated soil lead concentration (PbS), the overall rate of daily soil ingestion (IR_S), and the estimated fractional absorption of ingested lead (AF_S). The term "soil" is used throughout this document to refer to that portion of the soil to which adults are most likely to be exposed. In most cases, exposure is assumed to be predominantly to the top layers of the soil which gives rise to transportable soil-derived dust. Exposure to soil-derived dust occurs both in outdoor and indoor environments, the latter occurring where soil-derived dust has been transported indoors. Other types of dust, in addition to soil-derived dust, can contribute to adult lead exposure and may even predominate in the occupational setting; these include dust generated from manufacturing processes (e.g., grinding, milling, packaging of lead-containing material), road dust, pavement dust, and paint dust. This methodology, as represented in Equations 1 and 4, does not specifically account for site exposure to dusts that are not derived from soil. However, the methodology can be modified to include separate variables that represent exposure to lead in various types of dust.

4. As noted above, exposure to lead in soil may occur by ingesting soil-derived dust in the outdoor and/or indoor environments. The default value recommended for IR_S (0.05 g/day) is intended for occupational exposures that occur predominantly indoors. More intensive soil contact would be expected for predominantly outdoor activities such as construction, excavation, yard work, and gardening.

5. A lognormal model can be used to estimate the inter-individual variability in blood lead concentrations (i.e., the distribution of blood lead concentrations in a population of individuals who contact similar environmental lead levels).

6. Expected fetal blood lead concentrations are proportional to maternal blood lead concentrations.

According to the recommendations of the Technical Review Workgroup (U.S. EPA, 2003), the primary basis for using Equation 4 to calculate a risk based remediation goal (RBRG) is that fetuses and neonates are a highly sensitive population with respect to the adverse effects of lead on development and that 10 µg/dL is considered to be a blood lead level of concern from the standpoint of protecting the health of sensitive populations. Therefore, risk to the fetus can be estimated from the probability distribution of fetal blood lead concentrations (i.e., the probability of exceeding 10 µg/dL), as has been the approach taken for estimating risks to children. Equation 4 can be used to estimate the soil lead concentration at which the probability of blood lead concentrations exceeding a given value (e.g., 10 µg/dL) in fetuses of women exposed to environmental lead is no greater than a specified value (e.g., 0.05) see figure 1.0.

The methodology can be modified to accommodate different assumptions or to estimate RBRGs for different risk categories. For example, a RBRG could be estimated for risks to adults (e.g., hypertension) by substituting an appropriate adult blood lead concentration benchmark. Similarly, other exposure scenarios can be incorporated into the assessment.

Recommended default values for each of the parameters in Equations 1 - 4 are presented in Table 2. These defaults should not be casually replaced with other values unless the alternatives are supported by high quality site-specific data to which appropriate statistical analyses have been applied and that have undergone thorough scientific review.

Table 2. Summary of Default Parameter Values for the Risk Estimation Algorithm (Equations 1 - 4)

Parameter	Unit	Value	Comment
$PbB_{fetal,\ 0.95,goal}$	µg/dL	10	For estimating RBRGs based on risk to the developing fetus.
$GSD_{i,adult}$	--	2.07	This value was taken from National Health and Nutrition Evaluation Survey (NHANES) Phase I&II analysis. It is based on all races/ethnic groups combined in the South Region area of the U.S.A.
$R_{fetal/maternal}$	--	0.9	Based on Goyer (1990) and Graziano et al. (1990).
$PbB_{adult,0}$	µg/dL	1.39	This value was taken from NHANES Phase I&II analysis. It is based on all races/ethnic groups combined in the South Region area of the U.S.A.
BKSF	µg/dL per µg/day	0.4	Based on analysis of Pocock et al. (1983) and Sherlock et al. (1984) data.
IR_S	g/day	0.05	Predominantly occupational exposures to indoor soil-derived dust rather than outdoor soil; (0.05 g/day = 50 mg/day).
EF_S	day/yr	219	Based on U.S. EPA (1993) guidance for average time spent at work by both full-time and part-time workers (see Appendix for recommendations on minimum exposure frequency and duration).
AF_S	--	0.12	Based on an absorption factor for soluble lead of 0.20 and a relative bioavailability of 0.6 (soil/soluble).

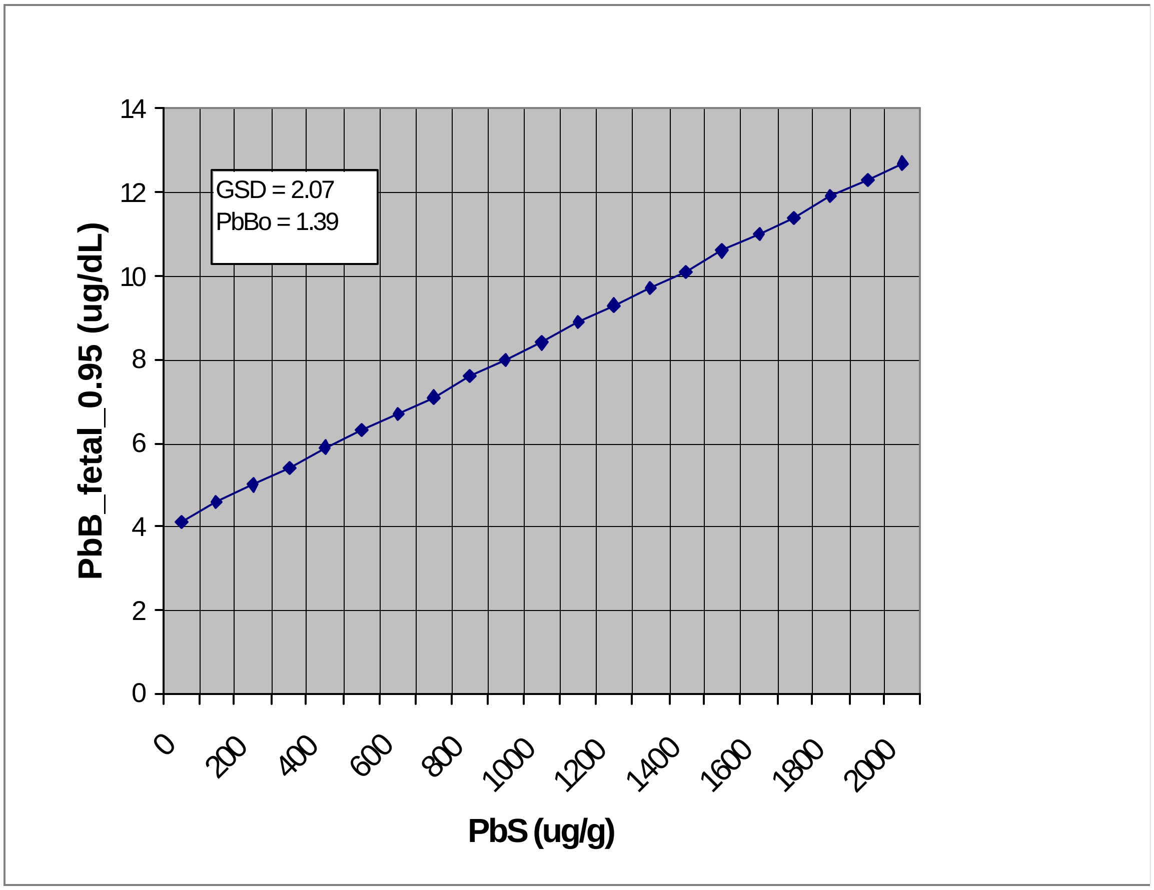

Figure 1.0: Predicted risk estimates output of the adult lead model (95th percentile blood lead levels among fetuses of adult workers in the southern region of the U.S. A.) using a baseline geometric mean blood lead level of 1.39 ug/dL and a geometric standard deviation of 2.07 associated with different soil lead concentrations.

Risk Characterization

Approach for Potential Carcinogenic Effects:

The excess lifetime cancer risk (ELCR) is evaluated quantitatively by multiplying the intake through the ingestion, dermal or inhalation routes in mg/kg-day by the cancer slope factor (SF) of each specific chemical carcinogen:

ELCR = Intake X SF

The total cancer risk is then calculated by adding the cancer risk associated with each route of intake (ingestion, dermal and inhalation) for each medium of exposure.
The U.S. EPA evaluates carcinogenic effects at a level of one in a million and considers this level as a point of departure and regulates cancer risk in the generally accepted level between the range of one in ten thousand to one in a million.

Approach for Potential Non-Carcinogenic Effects:

The non-carcinogenic effects are evaluated quantitatively by dividing the intake through the ingestion, dermal or inhalation routes by the reference dose toxicity value for each chemical (RfD). This quotient is referred to as the hazard quotient (HQ) for each chemical. A hazard quotient is calculated for each chemical of concern for each route of intake for each medium.

HQ = Intake/ RfD

The hazard quotients for each chemical is then added for each pathway to get the total hazard quotient of a specific medium. The total hazard quotient is referred to as the hazard index.
The U.S. EPA regulates noncarcinogenic effects at a hazard index value of not exceeding a value of one.

Approach for Lead:

The recommended U.S. EPA approach for evaluating risk to an adult in a non residential setting from exposure to lead in soil is to develop the relationship between soil lead concentration and the blood lead concentration in the developing fetus of adult women that have site exposures to contaminated soil.

The goal is to limit exposure to site contaminated soil by pregnant women in such a way that the developing fetus would have a chance of no more than 5% exceeding the EPA and CDC acceptable blood lead level of 10 µg/dL.

Summary of Risk Estimates:

Future Worker Scenario:

Cancer Risk:

The potential cancer risk to a hypothetical adult worker was calculated for exposure to on-site soil and soil from canal transects as one exposure medium and soil from hot spot areas as another exposure medium. The cancer risk through the oral and dermal routes of intake for exposure to carcinogen PAHs and PCB- 1260 was calculated. The total excess cancer risk from exposure to soil plus canal transects was found to be 3.4 E- 05. The total excess cancer risk from exposure to soil (hot spots) was 2.5E-05 (see table 4.0). The levels are within the U.S. EPA generally accepted cancer range of one in ten thousand to one in a million. Carcinogenic risk related to the slag piles was not calculated because neither PAHs nor PCBs were detected and carcinogenic slope factors do not exist for lead and antimony.

Non-Cancer Risk:

The potential non-cancer risk to a hypothetical adult worker was calculated for exposure to soil from the on-site and canal transects as one exposure medium and soil from hot spot areas and soil from slag piles. The hazard index for on-site soil and canal transects was calculated at 0.5, which is below the EPA recommended level for a HI of no more than one. The majority of the hazard was from Antimony, non carcinogenic PAHs contributed the rest (see table 3.0)

The hazard index for the on-site soil in hot spot areas was calculated at 13.7, which is above the EPA recommended level for a HI of not more than one. The majority of the hazard came from antimony, non-carcinogenic PAHs and PCB-1254 contributed the rest of the hazard.
The Hazard quotient for the on-site slag piles was calculated at 0.4, which is below the EPA recommended HI of no more than one. The hazard was mainly from exposure to antimony.

Lead Risk:

The risk to an adult worker from exposure to lead in soil (on-site soil and canal transects) was evaluated using the adult model recommended by the U.S. EPA. The population of adult workers were assumed to come from all races/ethnic group between the ages of 17 - 45 years. The concentration of all adult women populations are assumed to come from the southern region of the U.S.A as defined by the National Health and Nutrition Evaluation Survey (NHANES) phases 1 and 2 studies. The baseline geometric mean for this set of population is given by NHANES to be 1.39 µg/dL with a geometric standard deviation of 2.07.The model was run with parameter values defined in table 5.0. Based on this calculation, the 95^{th} percentile blood lead among fetuses of adult workers was found at 10.1 µg/dL and the probability that fetal blood exceed the target bloodl lead level of 10 µg/dL was calculated at 5.2 %, which is slightly above the U.S. EPA recommended level that no more than 5 % exceed the blood lead level of 10 µg/dL.

The risk to an adult worker from exposure to lead in soil (hot spots) was evaluated using the adult model recommended by the U.S. EPA. The population of adult workers were assumed to come from all races/ethnic group between the ages of 17 - 45 years. The concentration of all adult women populations are assumed to come from the southern region of the U.S.A as defined by the NHANES phases 1 and 2 studies. The baseline blood lead geometric mean for this set of population is given by NHANES to be 1.39 µg/dL with a geometric standard deviation of 2.07.The model was run with parameter values defined in table 5.0. Based on this calculation, the 95th percentile blood lead among fetuses of adult workers was found at 43.6 µg/dL and the probability that fetal blood exceed the target blood lead level of 10 µg/dL was calculated at 64.8 %, which is above the U.S. EPA recommended level that no more than 5 % exceed the blood lead level of 10 µg/dL.

The risk to an adult worker from exposure to lead in soil (slag piles) was evaluated using the adult model recommended by the U.S. EPA. The population of adult workers were assumed to come from all races/ethnic group between the ages of 17 - 45 years. The concentration of all adult women populations are assumed to come from the southern region of the U.S.A as defined by the NHANES phases 1 and 2 studies. The baseline geometric mean for this set of population is given by NHANES to be 1.39 µg/dL with a geometric standard deviation of 2.07.The model was run with parameter values defined in table 5.0. Based on this calculation, the 95th percentile blood lead among fetuses of adult workers was found at 21.3 µg/dL and the probability that fetal blood exceed the target blood lead level of 10 µg/dL was calculated at 27.2%, which is above the U.S. EPA recommended level that no more than 5 % exceed the blood lead level of 10 µg/dL.

Table 3.0

Non Cancer Hazard Estimates

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Surface Soil
Exposure Point:	On-Site
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	**Chemical**	**Non-Carcinogenic Hazard Quotient**								
		EPC (mg/kg)	**Primary Target organ**	**RfD (mg/kg-day)**			**Ingestion**	**Inhalation**	**Dermal**	**Exposure Route Total**
				Oral	**Dermal [a]**	**Inhalation**				
Soil (Site+Transects)	Antimony	250	Circulatory	4E-04	6E-05		0.31		0.16	
	Lead	1400								
	2-Methylnaphthalene	0.22	Circulatory	0.02	0.02		5.4E-06		5.6E-07	
	Acenaphthene	1.6	Liver	0.06	0.06	0.06	1.3E-05	3.9E-09	1.4E-06	
	Anthracene	3.1	N.O.E	0.3	0.3	0.3	5.1E-06	1.5E-09	5.2E-07	
	Fluoranthene	46	Kidney, liver	0.04	0.04	0.04	5.6E-04	1.7E-07	5.8E-05	
	Fluorene	1.3	Circulatory	0.04	0.04	0.04	1.6E-05	4.8E-09	1.6E-06	
	Pyrene	40	Kidney	0.03	0.03	0.03	6.5E-04	2.0E-07	6.8E-05	
							0.31	3.8E-07	0.16	**0.5**
Soil (Hot Spots)	Antimony	7300	Circulatory	4E-04	6E-05		8.9		4.8	
	Lead	9200								
	2-Methylnaphthalene	0.45	Circulatory	0.02	0.02		1.1E-05		1.1E-06	
	Acenaphthene	4.1	Liver	0.06	0.06	0.06	3.3E-05	1.0E-08	3.5E-06	
	Anthracene	8.3	N.O.E	0.3	0.3	0.3	1.3E-05	4.1E-09	1.4E-06	
	Fluoranthene	29	Kidney, liver	0.04	0.04	0.04	3.6E-04	1.1E-07	3.7E-05	
	Fluorene	3.8	Circulatory	0.04	0.04	0.04	4.7E-05	1.4E-08	4.8E-06	
	Pyrene	26	Immune	0.03	0.03	0.03	4.2E-04	1.3E-07	4.4E-05	
	PCB-1254	2.5		2E-05	2E-05	2E-05	6.1E-02	1.85E-05	6.8E-02	
							8.9	1.9E-05	4.8	**13.7**
Soil (Slag Piles)	Antimony	190	Circulatory	4E-04	6E-05		0.23		0.12	**0.36**
	Lead	4000								

Notes: RME = Reasonable Maximum Exposure

N.O.E= No Observed Adverse Effects

a = Dermal RfD were developed from Oral RfDs

Table 4.0

Cancer Risk Estimates

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: On-Site
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	**Chemical**	**Carcinogenic Risk**							
		EPC (mg/kg)	**Cancer Slope Factor per (mg/kg-day)**			**Ingestion**	**Inhalation**	**Dermal**	**Exposure Route Total**
			Oral	**Dermal [a]**	**Inhalation**				
Soil (Site+Transect)	Benzo(a)Anthracene	18	0.73	0.73	0.31	2E-06	3E-10	2.4E-07	
	Benzo(a) Pyrene	18	7.3	7.3	3.1	2E-05	3E-09	2.4E-06	
	Benzo(b) Fluoranthene	20	0.73	0.73	0.31	3E-06	3E-10	2.6E-07	
	Benzo(k) Fluoranthene	19	0.073	0.073	0.031	2E-07	3E-11	2.5E-08	
	Chrysene	23	0.0073	0.0073	0.0031	3E-08	4E-12	3.0E-09	
	Dibenzo(a,h)Anthracene	1	7.3	7.3	3.1	1E-06	2E-10	1.3E-07	
	Indeno(1,2,3-c,d) Pyrene	9.9	0.73	0.73	0.31	1E-06	2E-10	1.3E-07	
	PCB-1260	0.12	2.0	2.0	2.0	4E-08	1E-11	4.7E-08	
						3.0E-05	4E-09	3.2E-06	3.4E-05
Soil (Hot Spots)	Benzo(a)Anthracene	14	0.73	0.73	0.31	2E-06	2E-10	1.8E-07	
	Benzo(a) Pyrene	12	7.3	7.3	3.1	2E-05	2E-09	1.6E-06	
	Benzo(b) Fluoranthene	11	0.73	0.73	0.31	1E-06	2E-10	1.5E-07	
	Benzo(k) Fluoranthene	13	0.073	0.073	0.031	2E-07	2E-11	1.7E-08	
	Chrysene	14	0.0073	0.0073	0.0031	2E-08	2E-12	1.8E-09	
	Dibenzo(a,h)Anthracene	1.7	7.3	7.3	3.1	2E-06	3E-10	2.2E-07	
	Indeno(1,2,3-c,d) Pyrene	7.5	0.73	0.73	0.31	1E-06	1E-10	9.9E-08	
	PCB-1260	0.8	2.0	2.0	2.0	3E-07	9E-11	3.1E-07	
						2E-05	3E-09	2.6E-06	2.5E-05
Soil (Slag Piles)	Antimony	190							
	Lead	4000							

Notes: RME = Reasonable Maximum Exposure
EPC = Exposure Point Concentration

a = Dermal RfD were developed from Oral RfDs

Table 5.0
(Onsite Soil + Canal Transects)

Calculations of Blood Lead Concentrations (PbBs)
U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1	Using Equation 2
PbS	X	X	Soil lead concentration	ug/g or ppm	1400	1400
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.07	2.07
PbB_0	X	X	Baseline PbB	ug/dL	1.39	1.39
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	**ug/dL**	**3.4**	**3.4**
$PbB_{fetal, 0.95}$			**95th percentile PbB among fetuses of adult workers**	**ug/dL**	**10.1**	**10.1**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	**ug/dL**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**5.2%**	**5.2%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

000220

Table 5.0 (continued)
(Onsite Soil + Canal Transects)

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$	
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_{i1.645} * R)$	

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_{i1.645} * R)$

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Table 6.0
(Soil - Hot spots)

Calculations of Blood Lead Concentrations (PbBs)
U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1	Using Equation 2
PbS	X	X	Soil lead concentration	ug/g or ppm	9200	9200
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.07	2.07
PbB_0	X	X	Baseline PbB	ug/dL	1.39	1.39
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	**ug/dL**	**14.6**	**14.6**
$PbB_{fetal, 0.95}$			**95th percentile PbB among fetuses of adult workers**	**ug/dL**	**43.6**	**43.6**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	**ug/dL**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**64.8%**	**64.8%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

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Table 6 (continued)
(Soil - Hot spots)

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S.D}) + PbB_0$	
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_{i1.645} * R)$	

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_{i1.645} * R)$

Table 7.0
(Soil - Slag Piles)

Calculations of Blood Lead Concentrations (PbBs)
U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1	Using Equation 2
PbS	X	X	Soil lead concentration	ug/g or ppm	4000	4000
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.07	2.07
PbB_0	X	X	Baseline PbB	ug/dL	1.39	1.39
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	**ug/dL**	**7.2**	**7.2**
$PbB_{fetal,\,0.95}$			**95th percentile PbB among fetuses of adult workers**	**ug/dL**	**21.3**	**21.3**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	**ug/dL**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**27.2%**	**27.2%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,\,0.95}$ =	$PbB_{adult} * (GSD_{i}{}^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,\,0.95}$ =	$PbB_{adult} * (GSD_{i}{}^{1.645} * R)$

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Table 8.0

Calculations of Preliminary Remediation Goals (PRGs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version
date
05/19/03

Exposure	PRG Equation[1]				Values for Non-Residential Exposure Scenario: Using Equation 1	Using Equation 2
$PbB_{fetal,\ 0.95}$	X	X	95^{th} percentile PbB in fetus	ug/dL	10	10
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.1
PbB_0	X	X	Baseline PbB	ug/dL	1.4	1.4
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	0.7
$AF_{S,\ D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S,\ D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S,\ D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365
PRG			**Preliminary Remediation Goal**	**ppm**	**1,366**	**1,366**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same PRG.

***Equation 1, based on Eq. 4 in USEPA (1996).**

$$PRG = \frac{([PbB_{95}fetal/(R*(GSD_{i1.645})])-PbB_0)*AT_{S,D}}{BKSF*(IR_{S+D}*AF_{S,D}*EF_{S,D})}$$

****Equation 2, alternate approach based on Eq. 4 and Eq. A-19 in USEPA (1996).**

$$PRG = \frac{([PbB_{fetal,0.95}/(R*(GSD_{i1.645})])-PbB_0)*AT_{S,D}}{BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])}$$

Table 9.0

Preliminary Remediation Goal for Antimony:

Chemical Conc. in soil (Cs) mg/kg		
Ingestion Rate (IR) mg/day		50
Fraction Ingested (FI) unitless		1
Exposure Frequency (EF) days/year		250
Exposure Duration (ED)	years	25
Conversion Factor (CF)	kg/mg	1E-06
Body Weight (BW) kg		70
Averaging Time (Non-Cancer) AT_N	days	9125

Preliminary Remediation Goal through the oral route:

Cs = HQ x BW x AT_N x RfDo/ FI x IR x EF x ED x CF

= 1 x 70 x 9125 x 0.0004)/ 1 x 50 x 250 x 25 x 0.000001

Cs = 820 mg/kg

References

CH2M HILL, 2001. Human Health Risk Assessment. Ruston Foundry Site, Alexandria, Rapides Parish, Louisiana. (October 2001).

U.S. EPA , 2003. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Technical Review Workgroup for Lead. EPA-540-R-03-001.

Appendix B
Site-specific Synthetic Precipitation Leaching Procedure Criteria for Ruston Foundry

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
SUPERFUND DIVISION
Louisiana/Oklahoma Section
1445 Ross Avenue
Dallas, Texas 75202-2733

August 18, 2004

To: Paul Kuhlmeier and Chet Culley
c/o Kansas City Southern Railway

From: Katrina Coltrain
Remedial Project Manager

RE: Ruston Foundry Superfund Site
Lead and Antimony Synthetic Precipitation Leaching Procedure

LDEQ and EPA have received and reviewed your analysis of the SPLP application for Ruston Foundry (Attachment 1). Below are comments related to your analysis.

A procedure for determining an action threshold for soil removal based upon a threat to ground water quality is provided in Appendix H of RECAP published by the Louisiana Department of Environmental Quality (October 20, 2003). The procedures used for Ruston are summarized on pages H-9 through H-19.

The first step: determine the classification of the uppermost saturated zone beneath the site.
Step two: identify the ground water standard in Table 3.
Step three: calculate a site specific $DF_{summers}$ (Eq. 61) or apply the default value of 20, and calculate a site-specific DAF (Eq. 65) in accordance with Sections H2.4 and H2.5. [DF; dilution factor and DAF; dilution and attenuation factor]. Under MO-1 the longitudinal DF is taken from the look-up table on page H-13. Under higher tiers (MO-2 and MO-3) a site-specific longitudinal DF may be calculated using equation 65 or the default look-up table may be used.
Step four: determine the product of GW_{2or3} x $DF_{summers}$ x DAF_{2or3}

The parameters listed below were presented in your letter dated August 3, 2004. According to the letter, a minimum DAF of 11 was calculated when using the parameters listed below.

Groundwater Classification:	Class 2
Groundwater Standard:	GW2 = 0.015 mg/l [lead]
DFsummers:	default = 20
Dilution and Attenuation Factor (DAF2).	
POC to POE:	minimum distance approximately 517 feet
Sd:	thickness of saturated sequence is less than 10 feet

hydraulic conductivity	2.5 x 10-4 cm/s [260 ft/yr Darcy groundwater velocity]
effective porosity	35 percent for a silt-clay with sand.

LDEQ/EPA agree with the parameters used for the ground water classification, the ground water standard, and the $DF_{summers}$. As for the parameters used to calculate the DAF_2, we agree with the parameters used for hydraulic conductivity and effective porosity, however we disagree with the parameters used for Sd and the distance determined to exist between the point of compliance (POC) and the point of exposure (POE).

The POC is the sampling location positioned as near to the source as feasible without causing an adverse impact to groundwater. The SPLP values of 0.3 milligrams per liter (mg/L) for lead and 0.12 mg/l antimony are protective of soil leaching to ground water at or below the drinking water standard at the POC. Sample locations exceeding these values are scattered throughout the property and are not associated with a single definable 'source'. Given the lack of a single definable source at this site and the "scattered" nature of the analytical results, the highest SPLP result location should be defined as the POC. The POE is the nearest downgradient property. A DF_2 is applied to account for the physical processes of dilution and dispersion as the plume travels horizontally from the POC to the POE. Therefore, the distance to be used for the DF_2 calculation is the distance from this location (the POC) to the nearest downgradient property boundary (the POE). The maps provided show the sample location (Attachment 2) with the highest SPLP value (J2-RA), the ground water flow direction (east), and the distance line from the POC to the POE (Attachment 3). The estimated distance if the POE is the site boundary is 260 feet (purple line), and is estimated as 365 feet (purple line plus green line) if the POE is across the canal at the downgradient adjacent property boundary.

Sd is the estimated thickness of the dissolved contaminant of concern (COC) in the ground water within the permeable zone. There are two methods in RECAP to estimate Sd. One method is to calculate Sd. The other is to use the thickness of the impacted permeable zone. When no groundwater contamination is present, but an estimated Sd is still necessary for the purpose of calculating a $Soil_{gw}$ or SPLP concentration protective of leaching to ground water, the minimum value of less than 5 feet should be used as a proxy Sd. There is no ground water contamination at the Ruston site, therefore the less than 5 feet should be used as the value for Sd.

Using the parameters from the August 3, 2004 analysis, you calculated the [lead] SPLP value protective of ground water to be 3.3 mg/L as presented in the following calculation. Based on this value, there are no [lead] SPLP data points that exceed ground water protection criteria, and therefore, no soil that needs to be addressed based on this value.

Comparison GW2 to SPLP results = 0.015 mg/l x 20 x 11 = 3.3 mg/l SPLP
Maximum Ruston SPLP result = 1.81 mg/l Station J2-RA
Second highest SPLP value = 0.46 mg/l

Using the parameters defined in the LDEQ/EPA analysis, the lead SPLP value protective of ground water was determined to be 8.7 mg/L based on a distance of 260 feet and 8.7 mg/L based on a distance of 365 feet as presented in the following calculations. Based on these values, there are no lead SPLP data points that exceed ground water protection criteria, and therefore, no soil that needs to be addressed based on this value.

Comparison GW2 to SPLP results$_{\mathbf{260\ feet}}$ = 0.015 mg/l x 20 x 29 = 8.7 mg/l SPLP
Comparison GW2 to SPLP results$_{\mathbf{365\ feet}}$ = 0.015 mg/l x 20 x 29 = 8.7 mg/l SPLP

Using the parameters defined in this analysis, the antimony SPLP value protective of ground water was determined to be 3.5 mg/L based on a distance of 260 feet and 3.5 mg/L based on a distance of 365 feet as presented in the following calculations. Based on these values, there are no antimony SPLP data points that exceed ground water protection criteria, and therefore, no soil that needs to be addressed based on this value.

Comparison GW2 to SPLP results$_{\mathbf{260\ feet}}$ = 0.006 mg/L x 20 x 29 = 3.5 mg/L SPLP
Comparison GW2 to SPLP results$_{\mathbf{365\ feet}}$ = 0.006 mg/L x 20 x 29 = 3.5 mg/L SPLP

Based on the LDEQ/EPA evaluation, there are no SPLP data sample locations that exceed ground water protectiveness criteria. Therefore, the remedial action conducted at the site will be protective of ground water.

On the Application of Louisiana RECAP Protocols for Use of SPLP Results Related to Soil Removal

Ruston Superfund Site

The U.S. Environmental Protection Agency Region VI (EPA) has written into the proposed Explanation of Significant Differences (ESD) for the Ruston Superfund Site use of the SPLP leaching procedure as a benchmark for soil removal. To date dialogue with EPA has indicated that soil removal would be required where SPLP results exceed the drinking water standard for lead in soil. This interpretation of current RECAP is inaccurate. The process for establishing a soil removal criteria based upon a threat to underlying groundwater resources is provided below.

A procedure for determining a action threshold for soil removal based upon a threat to groundwater quality is provided in Appendix H of RECAP published by the Louisiana Department of Environmental Quality (October 20, 2003). Procedures are summarized at pages H-9 through H-19 of that appendix. The fundamental variables that affect a soil removal action level are; groundwater use classification, chemical properties, and physical properties of the host soil regime and underlying groundwater aquifer.

The first step in the assessment process is to determine the classification of the uppermost saturated zone beneath the site (*see* Figure 13 of RECAP).

Step two; identify the groundwater standard in Table 3. (*see* page H-19)

Step three, calculated a site specific $DF_{summers}$ (Eq. 61) or apply the default value of 20, and a site-specific DAF (Eq. 65) in accordance with Sections H2.4 and H2.5. [DF; dilution factor and DAF; dilution and attenuation factor]

Step four; determine the product of GW_{2or3} x $DF_{summers}$ x DAF_{2or3} :

If the leach test results are less than or equal to the product of the three factors then the soil is protective of groundwater and no further action is required. (***See*** p. H-19). As noted in the text of RECAP, "*Therefore, this pathway is eliminated from further consideration*". (at H-19)

Application to Ruston Property

Groundwater Classification. EPA interprets the uppermost saturated zone which is comprised of silty-clay with minor sand inclusions as a Class 2 (RI, p.2-27) although it also concludes that the subject sequence most likely cannot yield sufficient water to meet a Class 2 designation based upon on-site hydraulic testing by its contractor (at p. 3-10).

More likely than not, the uppermost water bearing zone would be receive a class 3 designation, however for purposes of this discussion the maximum designation of Class 2 published by EPA will be applied.

Groundwater Standard. Table 3 lists lead GW2 = 0.015 mg/l

$DF_{summers}$ default = 20

Dilution and Attenuation Factor (DAF2). [***from*** RECAP worksheet #18] Input includes distance from suspect SPLP observations to property boundary; minimum distance approximately 517 feet; thickness of saturated sequence from RI Section 3 is less than 10 feet, hydraulic conductivity from the RI is 2.5×10^{-4} cm/s [260 ft/yr Darcy groundwater velocity] and effective porosity of 35 percent for a silt-clay with sand. A minimum DAF of 11 is obtained.

Comparison GW2 to SPLP results = 0.015 mg/l x 20 x 11 = 3.3 mg/l SPLP.

Maximum Ruston SPLP result = 1.81 mg/l Station J2-RA (see RI at Table 5-1.14 and Table M-17) Second highest SPLP value = 0.46 mg/l

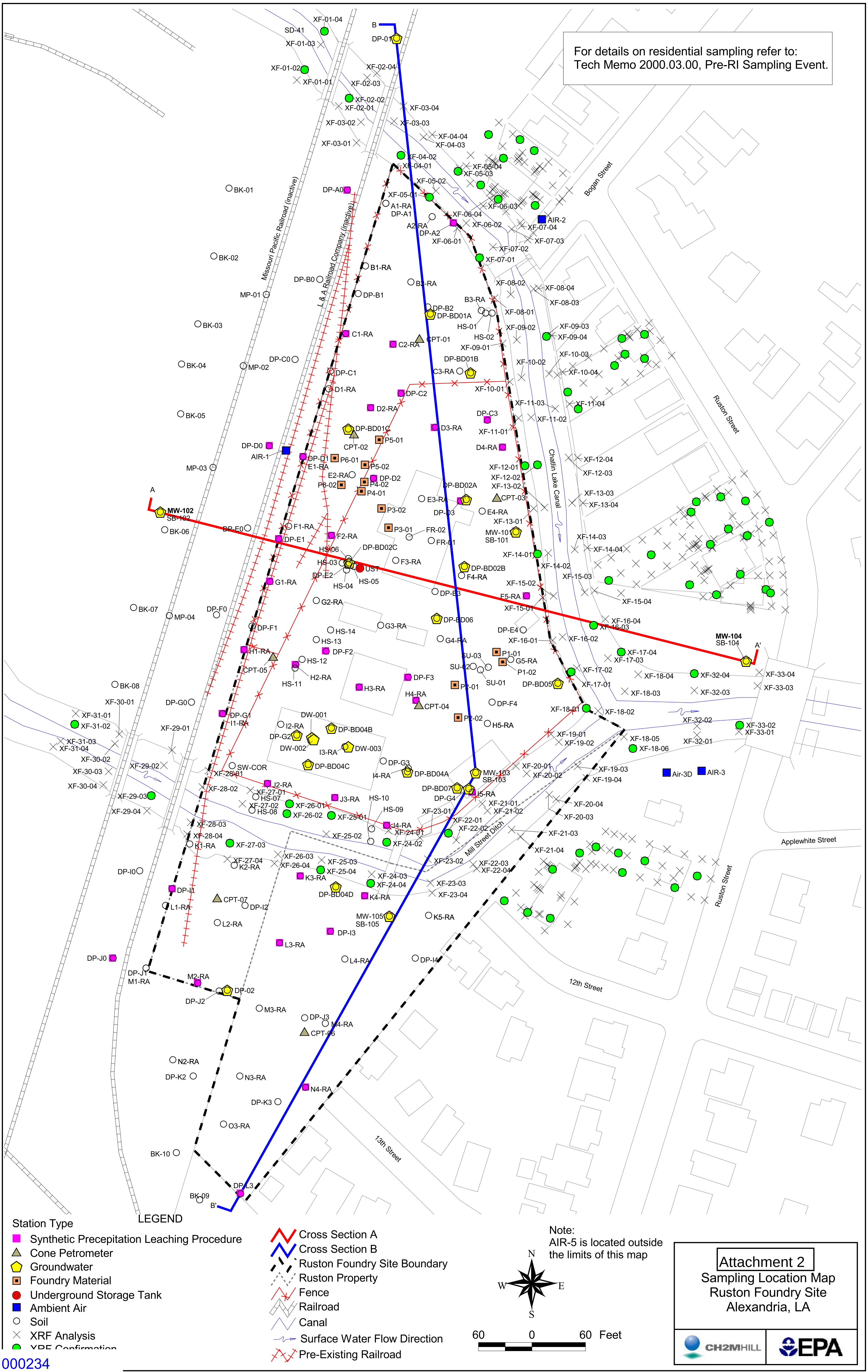
Therefore a safety factor of almost double the threshold for SPLP related soil cleanup exists under the above set of parameters and more than 7 times greater the next highest single SPLP result. In fact, any combination of aquifer variables applied to the Domenico-Schwartz DAF derived factor resulting in a DAF of 6 or higher results in no SPLP related soil removal. In addition, the default $DF_{summers}$ value for site conditions actually produces a DF2 factor greater than 30 and as high as 176.

Summary

Properly applied RECAP procedures outlined in this technical note clearly demonstrate SPLP results from the Remedial Investigation do not produce any location which would require soil removal to be protective of groundwater. In reality the safety factor is much greater than the values calculated above, as no SPLP sample below 1 ft leached above the MCL for lead and EPA has described the site as underlain by heavy clay of low permeability.

Lead has a known partition coefficient (K_d) with soil that has been measured as high as 7640 and a mean reported value of 99.[1] The K_d value is representative of how tightly a chemical will bind to a soil. Chemicals partition to fine grain soils, such as those found at the site, to a greater extent than to coarse grained soils. It is this phenomenon that has restricted lead to the uppermost one foot on a site which commenced operations almost 100 years ago.

[1] Dragun, J. 1998. The Soil Chemistry of Hazardous Materials, Amherst Scientific Publishers, Amhert, MA. P. 314-317.



T:\IS\Proj\Ruston\RI_Report\fig2-5_2-6.apr (Fig 2-5 (Sampling Location Map))

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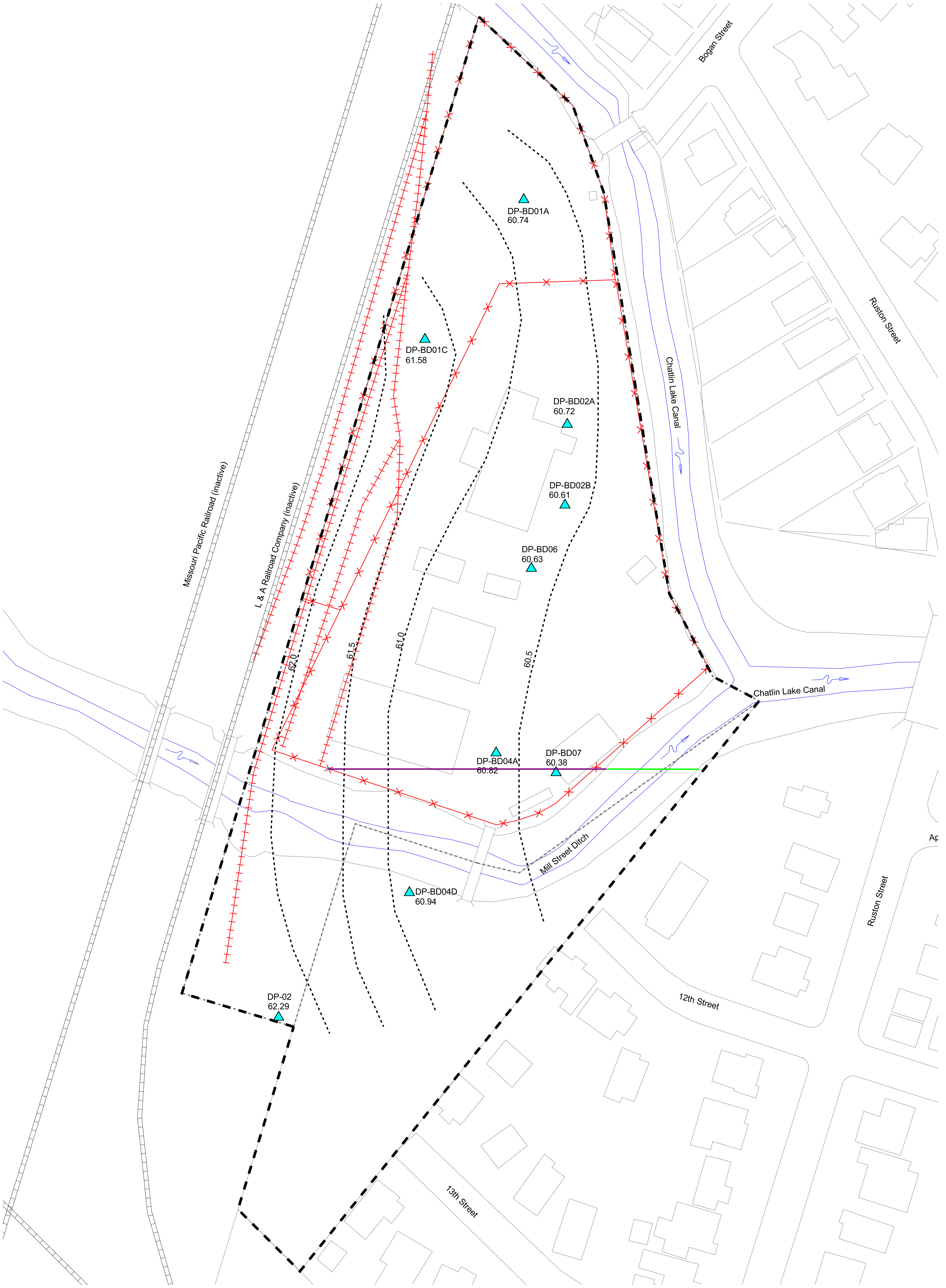

LEGEND

- Oct. 15 Water Level Sample Location
- Ruston Foundry Site Boundary
- Ruston Property
- Pre-Existing Railroad
- Fence
- Canal
- Surface Water Flow Direction
- Groundwater Elevation Contour (CI=0.5 feet)

N
W E
S

60 0 60 Feet

Attachement 3

Water Level Elevation Map Temporary Monitor Wells (October 15, 2000) Ruston Foundry Site Alexandria, LA

CH2MHILL

EPA

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Appendix C
Estimated Soil Waste Volume
for Ruston Foundry

Lead and antimony samples that were taken during the remedial investigation were plotted using ArcView GIS. Based on the revised cleanup levels, only those sample locations that exceeded either 1400 milligrams per kilogram (mg/kg) lead or 820 mg/kg antimony were plotted. The areal extent was determined by approximating the half way point between a sample location that exceeded the criteria and a sample location that did not exceed the criteria. No data points below one foot exceeded either cleanup level; therefore, the depth of remediation is assumed to be one foot. Using ArcView, the estimated volume is 1,766 cubic yards (yd^3).

The total estimated volume of hazardous waste is 1,300 yd^3. This material will be stabilized and then disposed offsite. After stabilization, it is assumed that the material to be disposed offsite will have doubled due to the addition of stabilization materials. Therefore, the total volume to be disposed offsite is 2,600 yd^3.

The volume of material to be shipped offsite is 4,366 yd^3. This value is multiplied by a conversion factor of 1.15 to account for loose volume, the increase in weight due to the presence of lead, and the estimation of tons per cubic yard. For cost estimation, the total volume estimated to be shipped offsite is 5,021 tons.

Appendix D
Revised Remedial Action Cost Estimate
for Ruston Foundry

CAPITAL COSTS: Stabilization and Offsite Disposal

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	PERCENTILE	COMMENTS
Mobilization						
Construction Equipment and Facilities	1	each	$14,344.00	$14,344.00	Median	
Mobilization of Personnel	1	each	$7,039.00	$7,039.00	Median	
Submittals/Implementation Plans	1	each	$7,780.00	$7,780.00	Median	
Setup/construct Temporary Facilities	1	each	$60,773.00	$60,773.00	Median	
Monitoring, Sampling, Testing and Analysis						
Air Monitoring and Sampling	1	each	$7,110.00	$7,110.00	Median	
Soil Sampling	120	each	$272.00	$32,640.00	Median	20 confirmation samples per acre
Laboratory Chemical Analysis	120	each	$285.00	$34,200.00	Median	20 confirmation samples per acre
Site Work						
Demolition	1800	square yard	$21.00	$37,800.00	Median	Concrete Pads
Clearing and Grubbing	6.6	acre	$5,509.00	$36,359.40	Median	
Water Well Plug and Abandon	1	each	$2,048.00	$2,048.00	NA	
Surface Water Collection and Control						
Erosion Control	6.6	acre	$13,137.00	$86,704.20	Median	
Air Pollution Collection and Containment						
Fugitive Dust/Vapor/Gas Emissions Control	6.6	acre	$13,903.00	$91,759.80	Median	
Solids Collection and Containment						
Contaminated Soil Collection	3066	cubic yards	$10.00	$30,660.00	Median	Excavate all contaminated material (1300 + 1766)
Drums/Tanks/Structures/Misc Demolition and Removal						
Tank Removal	1	each	$6,376.00	$6,376.00	Median	Remove/Dispose of UST/liquids
Structure Removal	8608	square foot	$12.00	$103,296.00	Median	Remove Buildings/Debris
Asbestos Abatement	6000	square foot	$11.00	$66,000.00	Median	Remove/Dispose of ACM
Stabilization						
Pozzolan Process (Lime/Portland Cement)	1300	cubic yards	$33.00	$42,900.00	Median	Stabilize TCLP Waste
Disposal (Commercial)						
Transport to Storage/Disposal Facility	5021	Ton	$56.00	$281,176.00	Median	RCRA D Facility (1766 soil + 2600 stabilized soil=
Disposal Fee and Taxes	5021	Ton	$96.00	$482,016.00	Median	4366 * 1.15 conversion factor = 5021)
Site Restoration						
Earthwork	1766	cubic yard	$13.00	$22,958.00	Median	Backfill Excavated Areas
Revegetation and Planting	6.6	acre	$5,708.00	$37,672.80	Median	Revegetate Excavated Areas
Demobilization						
Removal of Temporary Facilities	1	each	$5,288.00	$5,288.00	Median	
Removal of Temporary Utilities	1	each	$2,574.00	$2,574.00	Median	
Final Decontamination	1	each	$21,715.00	$21,715.00	Median	
Demobilization of Construction Equipment	1	each	$8,570.00	$8,570.00	Median	
Demobilization of Personnel	1	each	$5,997.00	$5,997.00	Median	
Submittals/Implementation Plans	1	each	$4,701.00	$4,701.00	Median	
Reporting						
Remedial Action Report	1	each	$10,000.00	$10,000.00		Estimated Unit Cost
SUBTOTAL				$1,550,457.20		
Contingency			25%	$387,614.30		
SUBTOTAL				$1,938,071.50		
Project Management			5%	$96,903.58		
Remedial Design			8%	$155,045.72		
Construction Management			6%	$116,284.29		
Site Information Database	1	each	$4,800	$4,800.00		
TO 000238				**$2,311,105.09**		

CAPITAL COSTS: Excavation and Offsite Disposal

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	PERCENTILE	COMMENTS
Mobilization						
Construction Equipment and Facilities	1	each	$14,344.00	$14,344.00	Median	
Mobilization of Personnel	1	each	$7,039.00	$7,039.00	Median	
Submittals/Implementation Plans	1	each	$7,780.00	$7,780.00	Median	
Setup/construct Temporary Facilities	1	each	$60,773.00	$60,773.00	Median	
Monitoring, Sampling, Testing and Analysis						
Air Monitoring and Sampling	1	each	$7,110.00	$7,110.00	Median	
Soil Sampling	120	each	$272.00	$32,640.00	Median	20 confirmation samples per acre
Laboratory Chemical Analysis	120	each	$285.00	$34,200.00	Median	20 confirmation samples per acre
Site Work						
Demolition	1800	square yard	$21.00	$37,800.00	Median	Concrete Pads
Clearing and Grubbing	6.6	acre	$5,509.00	$36,359.40	Median	
Water Well Plug and Abandon	1	each	$2,048.00	$2,048.00	NA	
Surface Water Collection and Control						
Erosion Control	6.6	acre	$13,137.00	$86,704.20	Median	
Air Pollution Collection and Containment						
Fugitive Dust/Vapor/Gas Emissions Control	6.6	acre	$13,903.00	$91,759.80	Median	
Solids Collection and Containment						
Contaminated Soil Collection	3066	cubic yards	$10.00	$30,660.00	Median	Excavate all contaminated material (1300 yd3 + 1766 yd3)
Drums/Tanks/Structures/Misc Demolition and Removal						
Tank Removal	1	each	$6,376.00	$6,376.00	Median	Remove/Dispose of UST/liquids
Structure Removal	8608	square foot	$12.00	$103,296.00	Median	Remove Buildings/Debris
Asbestos Abatement	6000	square foot	$11.00	$66,000.00	Median	Remove/Dispose of ACM
Disposal (Commercial)						
Transport to Storage/Disposal Facility	2031	Ton	$56.00	$113,736.00	Median	RCRA D Facility (1766 yd3 * 1.15 conversion factor = 2031 yd3)
Disposal Fee and Taxes	2031	Ton	$96.00	$194,976.00	Median	
Transport to Storage/Disposal Facility	1495	Ton	$246.00	$367,770.00	75%	RCRA C Facility (1300 yd3 * 1.15 conversion factor = 1495 yd3)
Disposal Fee and Taxes	1495	Ton	$214.00	$319,930.00	75%	
Site Restoration						
Earthwork	1766	cubic yard	$13.00	$22,958.00	Median	Backfill Excavated Areas
Revegetation and Planting	6.6	acre	$5,708.00	$37,672.80	Median	Revegetate Excavated Areas
Demobilization						
Removal of Temporary Facilities	1	each	$5,288.00	$5,288.00	Median	
Removal of Temporary Utilities	1	each	$2,574.00	$2,574.00	Median	
Final Decontamination	1	each	$21,715.00	$21,715.00	Median	
Demobilization of Construction Equipment	1	each	$8,570.00	$8,570.00	Median	
Demobilization of Personnel	1	each	$5,997.00	$5,997.00	Median	
Submittals/Implementation Plans	1	each	$4,701.00	$4,701.00	Median	
Reporting						
Remedial Action Report	1	each	$10,000.00	$10,000.00		Estimated Unit Cost
SUBTOTAL				$1,740,777.20		
Contingency			25%	$435,194.30		
SUBTOTAL				$2,175,971.50		
Project Management			5%	$108,798.58		
Remedial Design			8%	$174,077.72		
Construction Management			6%	$130,558.29		
Site Information Database	1	each	$4,800	$4,800.00		
TOTAL CAPITAL COST				**$2,594,206.09**		

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ANNUAL O&M COSTS	QTY	UNIT	UNIT COST	TOTAL COST	COMMENTS
Site Maintenance					
Mowing	12	months	200	$2,400	Estimated Unit Cost
Revegetation/refertilization/planting	2	acres	5,708	$11,416	Estimated Unit Cost
Institutional Control					
Conveyance Notice	1	notice	3,600	$3,600	Estimated Unit Cost
O&M Report					
Site Inspection	1	annual	4,000	$4,000	Estimated Unit Cost
SUBTOTAL				$21,416	
Contingency		30%		$6,425	
SUBTOTAL				$27,841	
Project Management		5%		$1,392	
Technical Support		10%		$2,784	
TOTAL ANNUAL O&M COSTS				**$32,017**	

PERIODIC COSTS	QTY	UNIT	UNIT COST	TOTAL COST	COMMENTS
Five-year Reviews					
Report, IC, and update Site O&M Plan	1	Year 5	$20,000	$20,000	1 Five-year Report, IC, and updated O&M Plan
Report, IC, and update Site O&M Plan	1	Year 10	$20,000	$20,000	1 Five-year Report, IC, and updated O&M Plan
Report, IC, and update Site O&M Plan	1	Year 15	$20,000	$20,000	1 Five-year Report, IC, and updated O&M Plan
Report, IC, and update Site O&M Plan	1	Year 20	$20,000	$20,000	1 Five-year Report, IC, and updated O&M Plan
Report, IC, and update Site O&M Plan	1	Year 25	$20,000	$20,000	1 Five-year Report, IC, and updated O&M Plan
Report, IC, and update Site O&M Plan	1	Year 30	$20,000	$20,000	1 Five-year Report, IC, and updated O&M Plan
Well Abandonment	5	5	460	$2,300	
Contingency		5%		$575	
TOTAL PERIODIC COSTS				**$122,875**	

STABILIZATION PRESENT VALUE ANALYSIS	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE
Capital Cost	0	$2,311,105.00		1.00	$2,311,105.00
Annual O&M Cost	1 TO 30	$960,510.00	$32,017.00	12.409	$397,298.95
Periodic Cost	5	$20,000.00	$20,000.00	0.713	$14,260.00
Periodic Cost	10	$20,000.00	$20,000.00	0.508	$10,160.00
Periodic Cost	15	$20,000.00	$20,000.00	0.362	$7,240.00
Periodic Cost	20	$20,000.00	$20,000.00	0.258	$5,160.00
Periodic Cost	25	$20,000.00	$20,000.00	0.184	$3,680.00
Periodic Cost	30	$22,875.00	$22,875.00	0.131	$2,996.63
ESTIMATED REMEDIAL ALTERNATIVE COST					$2,751,900.58

EXCAVATION AND DISPOSAL PRESENT VALUE ANALYSIS	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE
Capital Cost	0	$2,594,206.00		1.00	$2,594,206.00
Annual O&M Cost	1 TO 30	$960,510.00	$32,017.00	12.409	$397,298.95
Periodic Cost	5	$20,000.00	$20,000.00	0.713	$14,260.00
Periodic Cost	10	$20,000.00	$20,000.00	0.508	$10,160.00
Periodic Cost	15	$20,000.00	$20,000.00	0.362	$7,240.00
Periodic Cost	20	$20,000.00	$20,000.00	0.258	$5,160.00
Periodic Cost	25	$20,000.00	$20,000.00	0.184	$3,680.00
Periodic Cost	30	$22,875.00	$22,875.00	0.131	$2,996.63
ESTIMATED REMEDIAL ALTERNATIVE COST					$3,035,001.58

Appendix E
Institutional Control for Ruston Foundry

The Selected Remedy for Ruston Foundry will employ institutional controls in the form of a conveyance notice and a local zoning designation to inform the public of Site conditions and restrictions of the site to industrial use. Specifically, LDEQ, in accordance with Louisiana Revised Statute 30:2039 (2000) and Louisiana Administrative Code title 33 Part 5 § 3525 (2002), will require the owner(s) of the facility property to record a notice in the mortgage and conveyance records of Rapides Parish for the Site and if land use changes from industrial to non-industrial, the property owner shall notify the LDEQ within 30 days and the area shall be reevaluated to determine if conditions are appropriate for the proposed land use. A full copy of the notice must also be filed with the Rapides Parish zoning authority and any other authority having jurisdiction over local land use.

It will be the responsibility of the property owner, the local governing authority, and LDEQ to ensure that the IC is present in the deed record and remains in perpetuity and that the local zoning designation remains industrial. Enforcement of this IC and the zoning designation will be the responsibility of the State and the local governing authorities.

Appendix F
Letter from LDEQ

State of Louisiana
Department of Environmental Quality

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

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SEP 09 2004

Ms. Wren Stenger, Chief
Louisiana/Oklahoma/New Mexico Branch (6 SF-L)
US EPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202

RE: Request for Input from Louisiana on Explanation of Significant Differences
Ruston Foundry Site, CERCLIS #: LAD 985 185 107; **AI 12443**
Bogan Street, Alexandria, Rapides Parish Louisiana

Dear Ms. Stenger:

The Louisiana Department of Environmental Quality, Remediation Services Division (LDEQ-RSD) has reviewed the drafts and final version of the Explanation of Significant Differences (ESD) transmitted electronically to our office on or about September 1, 2004.

The LDEQ-RSD does not have any comments on the remedies selected and described in the ESD. The remedies were selected to protect human health and the environment for the future uses described in the ESD.

Thank you for allowing us the opportunity to review and comment on the Explanation of Significant Differences. We look forward to continuing to work together as this former foundry waste site is cleaned up and returned beneficial productive use.

If you have any questions, please feel free to contact me at (225) 219-3192.

Sincerely,

Keith L. Casanova

Keith L. Casanova, Administrator
Remediation Services Division

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c: LDEQ File Scanning Room 144- IAS

OFFICE OF ENVIRONMENTAL ASSESSMENT
BATON ROUGE, LOUISIANA 70821-4314 • TELEPHONE: (225) 219-3236 • FAX: (225) 219-3239
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Appendix G
Response to Comments on the
Ruston Foundry ESD

The concerns of the community should be considered when selecting a remedial alternative. Much information has been exchanged with the area residents and community leaders concerning the Site. The EPA held a Public Meeting (August 10, 2004) in Alexandria, Louisiana, to provide information to the public regarding cleanup activities. There is also an Administrative Record file at all information repositories that contains documents supporting this Explanation of Significant Differences. This Administrative Record file includes a transcript of the Public Meeting, which records the complete discussions related to the public comments. The comments received during the comment period (July 28 through August 31, 2004) are summarized below.

Oral Comments Submitted during the Public Meeting

Comment 1. My concern is that there should be a different route in and out of the area where it goes around rather than through the neighborhood. The bridge at the end of Bogan Street is not safe for truck traffic, there is a school located at the end of Bogan, and there are children that play in this area.

Response 1, Darrell Williamson, City of Alexandria. The railroad could utilize the property we bought from them and cross their former property [to the west]. One other alternative is utilization of the old railroad right-of-way that comes off of Third Street.

Response 1, EPA. The route to be used for transporting site waste is important. Before the route is finalized, discussions will be held with the community to determine its location.

Response 1, Chester Culley, KCS. Use of the railroad right-of-way would not be feasible because the trucks would not be able to cross the railroad bridges. However, if there is another route across the property using the railroad right-of-way, we will look into it. A bridge engineer will come out and inspect the bridge at the end of Bogan to ensure that it is safe for truck traffic before it is used. Two things to consider if using the railroad right-of-way would be the increase in cost associated with construction to support the trucks, rebuilding of bridges, etc. and the increase in risk of an event occurring because the right-of-way is not designed for truck traffic. Another possibility is to transport the material by rail, however, the trouble is that most of the facilities are located a distance from the site and would require transfers of material between rail lines. We would prefer to sit down with the community representatives to identify how we're going to transport the waste and identify the hours of transportation. At the same time we discuss the transportation route, we would like to discuss the communications plan which will identify contact persons for both KCS and the community.

Comment 2, Charles Smith, City Council. Before they start hauling, we would need to know what type of equipment or truck they're going to use. These trucks should be covered and not open air so that there is no dust or exposure to our community.

Response 2, EPA. Part of the work plan being developed for the removal of waste will take transportation of the waste into consideration. Before leaving the site, the outside of all trucks will be cleaned (decontaminated) so as not the transfer contamination from the site, and the trucks will be securely covered to contain waste within the bed of the truck.

Response 2, Chester Culley, KCS. The trucks that will be used for waste transportation will be lined with plastic. The plastic liner will be placed along the bottom of the truck bed, the waste will be placed in the bed on top of the liner, and then the liner will be folded over the waste to contain it. Before leaving the site, the truck will be inspected and cleaned.

Comment 3. My concern is that for some of the material that [will] be moved offsite, that stabilization occur before moving.

Response 3, EPA. Approximately 1,300 cubic yards of hazardous waste has been estimated to exist on the site. Stabilization is the first consideration for addressing the waste, however, during discussions related to remedial activity, stabilization may not be the most effective, efficient, and productive process for removing the waste from the site. Because of this, the ESD has incorporated a contingency remedy that is excavation and offsite disposal. Should the process of excavation and offsite disposal prove to be the more appropriate method of addressing the hazardous waste, then stabilization will no longer be required. Supporting data and information on the application of the contingency remedy will be required before the contingency is implemented.

Comment 4. My concern is that asbestos is located on the site, and we know that asbestos can get into the air and then into people's lungs. We would like the persons removing the asbestos to be EPA certified and that air monitoring be done to detect potential debris so that the citizens in that area can be forewarned.

Response 4, EPA. The volume of asbestos is estimated to be approximately 22 cubic yards and was found in siding/roofing type material located on the ground surface. The asbestos will be accumulated and disposed by Louisiana licensed certified asbestos personnel. During removal and preparation for disposal, the air will be monitored to ensure that no asbestos is released.

Comment 5. What about the noise level? I know with progress we have to have some noise, but for those people that live next to the site this will be an inconvenience for them.

Response 5, EPA. Every attempt will be made to limit the noise levels and to work within the specified construction hours. Before the construction hours are finalized, discussions will be held with the community.

Comment 6. What about the underground storage tank?

Response 6, EPA. The underground storage tank, its contents, and any surrounding contaminated soil will be removed and disposed in an offsite landfill. This item was identified in the 2002 Record of Decision and remains part of this ESD.

Response 6, Chester Culley, KCS. The underground storage tank will be addressed as part of the remedy. This includes its contents, the tank, and includes removing any subsurface soils that were impacted due to leaking. If the tank is full of some compound, it will be pumped out and transported for recycle, and then the tank will be removed, decontaminated, and cut up. The sampling protocol for the State and EPA will be followed for the subsurface soils, and the hole will be filled with imported clean soil.

Written Comments Submitted During the Comment Period

Written comments were submitted by KCS in a letter dated August 31, 2004 and are summarized below.

Comment 7. Throughout the ESD, EPA refers to KCS as "the responsible party." However, KCS has consistently denied that it is a liable party under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") and no court has found that KCS is a liable party. Additionally, this reference to KCS as "the responsible party" implies that there are no other potentially responsible parties for the response costs at the Site, when in fact there are other potentially responsible parties for the contaminants at the Site. KCS requests that EPA refer to KCS in the ESD as The Kansas City Southern Railway Company, instead of "the responsible party."

Response 7, EPA. The ESD will be revised to incorporate the company name, Kansas City Southern Railway Company. The term responsible party will be revised to potentially responsible party.

Comment 8. KCS would like EPA to clarify that the reference on page eight in the first sentence of the second full paragraph is based on a residential scenario. KCS asks that the sentence be revised as follows "Because waste will be left onsite above levels that allow for unlimited use and unrestricted exposure under a residential use scenario, . . ."

Response 8, EPA. The policy threshold for determining whether institutional controls are appropriate at a site is whether the site can support unlimited use and unrestricted exposure regardless of the reasonably anticipated future land use. The unlimited use and unrestricted exposure threshold is often confused with the concept of a “residential cleanup”; however, these are not the same. The Site is restricted to industrial use only; therefore, the above referenced sentence is consistent with policy and guidance and will not be revised as requested.

Comment 9. On page eight in the second full paragraph, EPA states that groundwater monitoring will be required as part of the O&M for the site. However, groundwater monitoring is unnecessary because the data for ground water, surface water, and sediment did not have carcinogenic risk that exceeded the risk range or non-carcinogenic risks that exceeded 1. Also, data shows that all hazardous substances are below the Maximum Contaminant Levels for ground water. Basically, the data has established that further ground water monitoring is not necessary because geologically and hydrogeologically there is no method for contaminant transport to ground water. In a July 23, 2004 email correspondence from Ms. Veilleux to Mr. Tripp, Ms. Veilleux stated that ground water monitoring would not be part of the O&M for the site and that the wells should be plugged and abandoned in accordance with Louisiana state laws during the Remedial Activities at the Site. In our conference call with EPA on July 27, EPA agreed that O&M would not include ground water monitoring and that the final ESD would be changed accordingly.

Response 9, EPA. The ESD will be revised to indicate that ground water monitoring will not be part of O&M activity. Because Site soils do not exceed the site-specific SPLP cleanup values protective of ground water and the risk assessment determined that no complete exposure pathway exists, the ground water will not be monitored and the existing wells will be plugged and abandoned according to LDEQ requirements.

Comment 10. On page eight in the second full paragraph, EPA states that site reports are to be conducted twice a year, instead of annually. In our conference call on July 27, EPA agreed that semi-annual reports would not be necessary and that annual reports would be sufficient given the minimal O&M required for the site. We ask that the final ESD be changed accordingly.

Response 10, EPA. The ESD will be revised to show that O&M documentation will need to be submitted annually not semi-annually.

Comment 11. In Appendix D, EPA provides the conveyance notice language that will be filed as a part of the Institutional Controls for the subject Site. This notice contains some inflammatory language regarding the risks posed by constituents that will remain at the site. The language is also alarming insofar as it states that moving "any" soil may subject that person to CERCLA liability. In addition, the notice language also incorrectly states that ground water monitoring will be required as part of the O&M for the Site, which is contrary to DOJ's July 23, 2004 email correspondence (as discussed above in Comment 9). This specific notice language it is not required by either EPA guidance (i.e., EPA's Model Environmental Protection Easement (December 1997)) or the Louisiana statutes and regulations cited in Appendix D. In addition to the problematic notice language, EPA also states in Appendix D that it will be the responsibility of "the Responsible Party" (i.e., KCS) to ensure that the Institutional Control is present in the deed record and remains in perpetuity. However, KCS cannot be responsible for these tasks given that KCS does not own the property. KCS believes that it is unnecessary to identify the precise notice language for the institutional controls at this time, given that the remedy has yet to be implemented at the Site. The text of the ESD is sufficient to inform the public of the need for and basic elements of the institutional controls to be implemented at the Site. Consequently, KCS requests that EPA remove Appendix D from the document.

Response 11, EPA. The references to ground water O&M activities have been deleted. Upon further review of the site sampling data, LDEQ applied the procedure for determining a site-specific cleanup value for soil removal based upon a threat to ground water quality provided in Appendix H of RECAP (see Section VI and Appendix B). Because Site soils do not exceed the site-specific calculated SPLP cleanup value protective of ground water and the risk assessment determined that no complete exposure pathway exists, the ground water will not be monitored and the existing wells will be plugged and abandoned according to LDEQ requirements. However, annual O&M activities will include, but are not limited to, Site inspection and maintenance, IC inspection and enforcement, and Site reports. Also, reviews of the remedy by EPA will be conducted no less than every five years to ensure that the remedy is functioning as designed, and remains protective of human health and the environment.

The references to the responsibility of PRP to ensure that the Institutional Control is present in the deed record and remains in perpetuity has been deleted. It is the responsibility of the property owner to file, in accordance with state law, a notation on the deed to the property or on some other instrument which is normally examined during the title search, that will in perpetuity, notify any potential purchaser of the property use and restrictions. This notice has to be filed with the local zoning authority or the authority with jurisdiction over local land use and with the administrative authority.

The comment indicates that the specific notice language is not required by EPA guidance or the LA statutes that are cited. According to the September 2000, EPA guidance Institutional Controls: a Site Manger's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups, ICs should be evaluated in the same level of detail as other remedy components. ICs are considered response actions under CERCLA, must meet all statutory requirements, and are subject to the nine evaluation criteria outlined in the NCP (40 CFR 300.430 (e)(9)(i)) for CERCLA cleanups. However, before applying these criteria and in order to properly and effectively evaluate the IC, the following determinations should be made:

- Objective—Clearly state what will be accomplished through the use of ICs.
- Mechanism—Determine the specific types of ICs that can be used to meet the various remedial objectives.
- Timing—Investigate when the IC needs to be implemented and/or secured and how long it must be in place.
- Responsibility—Research, discuss, and document any agreement with the proper entities on exactly who will be responsible for securing, maintaining and enforcing the control. It might be useful to secure a written statement of the appropriate entities' willingness to implement, monitor, and enforce the IC prior to the signature of the remedy decision document.

The references to Louisiana Revised Statute (LA R.S.) 30:2039 Recordation of Notice of Solid or Hazardous Waste Site by Landowner (2000) and Louisiana Administrative Code (LAC) title 33 Part 5 § 3525 Post-Closure Notices (2002) are appropriately cited and describe the process for and information to be included in the IC. Specifically, LA R.S. 30:2039 states " If a landowner has actual or constructive knowledge that his property has been identified by the department as an inactive or abandoned solid waste landfill or hazardous waste site, he shall cause notice of the identification of the location of the waste site to be recorded in the mortgage and conveyance records of the parish in which the property is located." It also states that "If any person wishes to remove such notice, he shall notify the secretary prior to requesting the removal from the clerk of court in the parish where the property is located. The request shall specify the facts supporting removal of the notice, including any evidence that the waste no longer poses a potential threat to health or the environment. Upon finding that the waste no longer poses a potential threat to health or the environment, the secretary shall approve removal of the notice." In addition, LAC title 33 Part 5 § 3525, states that "Within 60 days of certification of closure of the first hazardous waste disposal unit and within 60 days of certification of closure of the last hazardous waste disposal unit, the owner or operator must record, in accordance with state law, a notation on the deed to the facility property or on some other instrument which is normally examined during the title search that will in perpetuity notify any potential purchaser of the property that the land has been used to manage hazardous wastes, that its use is restricted under LAC 33:V.Chapter 35; and that the survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility required by LAC 33:V.3517 and this Section have been filed with the local zoning authority or the authority with jurisdiction over local land use and with the administrative authority." Although the site will not have a hazardous waste disposal unit, hazardous substances will remain onsite and require restrictions for industrial use only.

Comment 12. In a memo from Ms. Coltrain of EPA to KCS dated August 18, 2004, EPA concluded that based on the Louisiana Department of Environmental Quality/EPA evaluation, there are no Synthetic Precipitation Leaching Procedure (SPLP) data sample locations that exceed ground water protection criteria for lead and antimony at the Site. Therefore, EPA has concluded that no soil at the Site needs to be addressed based on the SPLP value for lead and antimony. KCS asks that the final ESD be modified to reflect EPA's conclusions in this regard and that the ESD be revised to inform the public that Remedial Objectives 3 and 4 have been met.

Response 12, EPA. The ESD will be revised to indicate that the SPLP results were further analyzed using the Louisiana Risk Evaluation/Corrective Action Program (RECAP, October 20, 2003). The site-specific SPLP cleanup value protective of ground water for lead was calculated to be 8.7 mg/L and for antimony was calculated to be 3.5 mg/L (Appendix B). Based on this evaluation, there are no Ruston SPLP sample locations that exceed ground water protectiveness cleanup values.

Comment 13. KCS has determined that off-site disposal and/or recycling of the iron slag and sand material is a more cost-effective alternative than on-site stabilization followed by off-site disposal of those materials. Also, KCS has determined that on-site stabilization of the iron slag and sand would create more air borne dust than simply removing these materials for off-site disposal and/or recycling. Consequently, KCS has determined that off-site disposal and/or recycling is more protective from a short-term health based risk standpoint than on-site stabilization followed by off-site disposal. KCS requests that the final ESD reflect that on-site stabilization is no longer an option and that the iron slag and sand materials will be taken directly off-site for disposal and/or recycling.

Response 13, EPA. The contingency remedy will only be implemented once data and information supporting its use has been evaluated by the regulatory agencies. Though KCS has made this determination, data and information supporting this change has not been presented to the regulatory agencies for review and discussion. Determination of the appropriate method to be used in addressing the hazardous waste will be made after the regulatory agencies have had time to review and discuss the treatability evaluation conducted by KCS.