

US EPA RECORDS CENTER REGION 5



508966

MATTHIESSEN AND HEGELER ZINC COMPANY SUPERFUND SITE

LaSalle, Illinois

Record of Decision

U.S. Environmental Protection Agency, Region 5

77 W. Jackson Blvd.
Chicago, IL 60604

April 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ABS	Activity-Based Sampling
ACM	Asbestos-Containing Material
AOC	Administrative Order on Consent
AR	Administrative Record
ARARs	Applicable or Relevant and Appropriate Requirements
ASAO	Administrative Settlement and Agreement on Order of Consent
BERA	Baseline Ecological Risk Assessment
bgs	Below Ground Surface
BMPs	Best Management Practices
Carus	Carus Chemical Company
C/D	Construction/Demolition
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminants of Concern
CSM	Conceptual Site Model
CWA	Clean Water Act
EA	Exposure Area
EF	Exposure Frequency
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentrations
ESVs	Ecological Screening Values
FCM	Food Chain Model
FI	Fractional Uptakes
FS	Feasibility Study
ft bgs	Feet Below Ground Surface
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IAC	Illinois Administrative Code
IC	Institutional Control
ICMP	Institutional Control Management Plan
IEPA	Illinois Environmental Protection Agency
IEUBK	Integrated Exposure Uptake Biokinetic
LOAEL	Lowest Observed Adverse Effects Level
LVR	Little Vermillion River
mg/kg	Milligrams per kilogram
MOU	Memorandum of Understanding
NCP	National Contingency Plan
NOAEL	No Observed Adverse Effects Level
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit

PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PRGs	Preliminary Remediation Goals
RAFS	Releasable Asbestos Field Sampler
RAOs	Remedial Action Objectives
RBA	Relative Bioavailability
RI	Remedial Investigation
ROD	Record of Decision
SLERA	Screening Level Ecological Risk Assessment
START	Superfund Technical Assistance and Response Team
SVOC	Semi-volatile organic compound
TBCs	To-Be-Considered requirements
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
UAO	Unilateral Administrative Order
µg/kg	Micrograms Per Kilogram
µg/L	Micrograms Per Liter
UU/UE	Unlimited Use and Unrestricted Exposure
VOCs	Volatile Organic Compounds
WBZ	Water Bearing Zone

Part 1 – Declaration

1.1 Site Name and Location

Matthiessen and Hegeler Zinc Superfund Site
CERCLA SITE ID# IL0000064782
LaSalle County, LaSalle, Illinois

1.2 Statement of Basis and Purpose

This decision document presents the Selected Remedy for the Matthiessen and Hegeler Zinc Company Site (the Site) located in LaSalle, Illinois. The Site consists of two operable units. Operable Unit 1 (OU1) covers approximately 47 acres and includes the Carus Chemical Company (Carus) property, a large slag pile located along the Little Vermilion River (LVR), and the LVR adjacent to the Site. Operable Unit 2 (OU2) includes approximately 180 acres of land that was used for industrial operations by the former Matthiessen and Hegeler Zinc Company, and any properties found to be contaminated with site-related waste in the surrounding residential neighborhoods. The surrounding neighborhoods include approximately 5,000 residential properties in LaSalle and portions of Peru, Illinois.

The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601 *et seq.* (CERCLA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 (NCP). This decision is based on information contained in the Administrative Record file (AR) for the Site. The Illinois Environmental Protection Agency (IEPA) concurs with the Selected Remedy.

1.3 Assessment of Site

The response action selected in this Record of Decision (ROD) is necessary to protect human health and the environment from actual or threatened releases of hazardous substances into the environment.

1.4 Description of Selected Remedy

This ROD describes the Selected Remedy for both Site operable units. The Selected Remedy is the final remedy for the Site. However, the residential and commercial/ industrial cleanup levels selected in this ROD for one of the contaminants of concern (COCs) – lead – are considered interim cleanup levels. New EPA guidance, entitled *Updated Scientific Considerations for Lead in Soil Cleanups* (OLEM Directive 9200.2-167, December 22, 2016), highlights the current science and risk assessment tools that EPA Regions may consider when addressing lead-contaminated soils at CERCLA sites. In light of this new guidance, EPA will re-evaluate the lead cleanup levels for this Site during the remedial design phase, prior to initiating the remedial action. Any changes to the lead cleanup levels will be addressed in an appropriate future decision document.

The major components of the Selected Remedy related to OU1 include the following: placing a soil cover over areas of the Carus Plant Area where cover is needed to reduce potential exposures; removing soil and vegetation from a gravel-paved storage area and placing the materials within the Slag Pile Area, then lining the storage area with asphalt; and sloping, benching, and placing an engineered soil cover over the large slag pile, installing revetments at the toe of the slag pile's slope along the LVR, using high-density tree planting for additional slope stabilization, and implementing other measures to manage surface water runoff and control erosion. The major components of the Selected Remedy related to OU2 include the following: excavating contaminated soil from the four different areas of the former smelter facility property (the Main Industrial Area, the North Area, the Building 100 Area, and the Rolling Mill Area); excavating contaminated soil from residential properties within the areal extent of contamination of the Site, then backfilling the excavations with clean soil and restoring the properties; and constructing an on-site consolidation cell on the former smelter facility property and placing all OU2 excavated materials within the consolidation cell under a soil cover. The Selected Remedy also includes the use of institutional controls (ICs) and property access restrictions at both OUs to ensure long-term effectiveness and permanence.

Source materials constituting principal threat wastes have been identified in some areas of the Site. Sampling showed that characteristic hazardous wastes are present in the OU1 Slag Pile Area and the OU2 Main Industrial Area. The Selected Remedy uses treatment technologies to reduce the mobility of the hazardous wastes at the OU2 Main Industrial Area, but does not use treatment technologies to address the OU1 Slag Pile Area because treatment of the large slag pile is not considered practicable or cost-effective.

The selected remedial alternatives for the various areas of each OU are listed below and, together, constitute the Selected Remedy:

OU1

- **Carus Plant Area:** Alternative 6 – Soil Cover
- **Slag Pile Area (including Slope Stability):** Alternative 6 – Soil Cover, in conjunction with Alternative 15 – Sloping and Benching + Plantings + Revetments at the Toe of the Slope + Best Management Practices (BMPs)

OU2

- **Main Industrial Area:** Alternative 2 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **North Area:** Alternative 4 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **Building 100 Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **Rolling Mill Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **Off-Site Residential Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

The sequence and timing of the remedial action activities at each operable unit will be determined during the remedial design phase.

1.5 Statutory Determinations

The Selected Remedy set forth in this ROD achieves the statutory and regulatory mandates set forth in CERCLA Section 121 and the NCP. Specifically, the Selected Remedy addresses exposure to contaminants in a manner that is protective of human health and the environment, complies with federal and state applicable or relevant and appropriate requirements (ARARs), is cost-effective, and utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The Selected Remedy satisfies the statutory preference for treatment as a principal element of the remedy.

The Selected Remedy provides the best balance of tradeoffs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site disposal without treatment, and considering IEPA and community acceptance.

Because the Selected Remedy will result in hazardous substances, pollutants or contaminants remaining on the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE), the United States Environmental Protection Agency (EPA) will conduct a statutory review of the Selected Remedy within five years after initiation of the remedial action, and every five years thereafter, to ensure that the Selected Remedy is, or will be, protective of human health and the environment.

1.6 Data Certification Checklist

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the AR for the Site.

Information Item	Section in ROD
Chemicals of concern and their respective concentrations	2.5
Baseline risk represented by the chemicals of concern	2.6
Cleanup levels established for chemicals of concern and the basis for these levels	2.12
How source materials constituting principal threats are addressed	2.11
Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD	2.6
Potential land and groundwater use that will be available as a result of the Selected Remedy	2.12
Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	2.12
Key factor(s) that led to selecting the remedy (that is, describe how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)	2.12, 2.13

1.7 Authorizing Signature

EPA, as the lead agency for the Site, formally authorizes this ROD.



Margaret Guerriero, Acting Director
Superfund Division
U.S. Environmental Protection Agency
Region 5

April 7, 2017

Date

1.8 Support Agency Acceptance

IEPA, as the support agency for the Site, formally concurs with this ROD.

Alec Messina, Director
Illinois Environmental Protection Agency

Date

Part 2 – Decision Summary

2.1 Site Name, Location, and Brief Description

2.1.1 Site Name, Identification Number, Official Site Address, Location

Matthiessen and Hegeler Zinc Company Superfund Site
CERCLA SITE ID# IL0000064782
LaSalle County, LaSalle, Illinois

2.1.2 Site Type and Brief Description

The Site is located in the City of LaSalle, Illinois (see Figure 1), although a portion of the Off-Site Residential Area being investigated is located in the City of Peru, located west of LaSalle. The industrial portion of the Site occupies approximately 227 acres and houses an inactive zinc smelting and rolling facility as well as an active chemical manufacturing plant which is owned and operated by Carus Chemical Company. The LVR flows south along the eastern edge of the Site and eventually joins the Illinois River. Approximately 5,000 private residences are located west, south, and north of the industrial portion of the Site. The City of LaSalle obtains all of its drinking water from a cluster of four active wells located approximately three-quarters of a mile south of the Site. A wetland is located approximately two miles upstream of the Site on the LVR. Also, the Lake DePue State Fish and Wildlife Area and the Spring Lake Heron Colony, which provides breeding habitat for the state-endangered great egret, are located about 15 miles downstream of the Site.

Industrial operations at the Site began in 1858, and some operations continue (at OU1) through the present day. More details regarding the industrial operations at each OU are provided below. The boundaries of OU1 and the non-residential portion of OU2 are depicted on Figure 2. OU1 includes property owned by Carus, located within the southern portion of the Site, and a portion of the LVR. A large slag pile generated from former smelting operations on OU2 is located on OU1. OU2 includes the formerly-occupied rolling mill area, all other associated buildings and land related to the former smelting operations, and the Off-Site Residential Area.

EPA is the lead agency and IEPA is the support agency. Carus conducted the remedial investigation/feasibility study (RI/FS) for OU1 and EPA conducted the RI/FS for OU2.

2.2 Site History and Enforcement Activities

Operable Unit 1 History

Carus began operations in 1915, manufacturing potassium permanganate products used for water purification and wastewater treatment, and its operations continue through the present time. Carus added other products to its manufacturing operations over time, including the following:

- Phosphate corrosion inhibitors
- Manganese dioxide
- Sodium permanganate
- 2,3-pyridine dicarboxylic acid
- Manganese-based catalysts
- Hydroquinone
- Manganese sulfate
- Cesium compounds

Carus's operations are independent from those formerly conducted by the Matthiessen and Hegeler Zinc Company on the industrial portion of OU2.

During the period from 1858 to 1961, sinter and slag from the smelting operations at OU2 were placed at various locations on what is now designated as OU1. Sinter and slag were placed primarily in an upland area of OU1 near the LVR. The resultant slag pile covers an area of approximately 17.7 acres and stands approximately 80 to 90 feet tall. Carus did not own the slag pile area during the zinc smelting operational period at OU2, but later purchased the property containing the slag pile.

Operable Unit 2 History

The Matthiessen and Hegeler Zinc Company operated a zinc smelter at the industrial portion of OU2 from 1858 until 1961. The company added a rolling mill to its operations in 1866 to produce zinc sheets. This process included a furnace that used producer gas as fuel. Any sulfur dioxide generated was recovered and converted into sulfuric acid and stored in on-site tanks. For a few years during the early 1950s, an ammonium sulfate fertilizer plant operated at OU2. Coal mining also occurred on OU2 until 1937, and two mining shafts (one vertical and one horizontal) still remain at the Site. Zinc smelting ceased in 1961, and sulfuric acid manufacturing halted in 1968.

The Matthiessen and Hegeler Zinc Company declared bankruptcy in 1968, and only basic rolling mill operations took place at OU2 from 1968 until 1978. In 1980, Frederick L. (Fred) and Cynthia Carus purchased the 12-acre rolling mill tract of land which became the LaSalle Rolling Mill, Inc. The LaSalle Rolling Mill, Inc.'s footprint is bisected by two land parcels, one owned by Fred and Cynthia Carus and the other owned by LaSalle Acres, Inc. The LaSalle Rolling Mill, Inc. generated penny blanks for the U.S. Mint until 2000, when the company ceased operations and declared bankruptcy.

Metals and cyanide were used at OU2 during past operations. The operations included, among other things, converting raw zinc ore containing zinc sulfide to zinc oxide and subsequent smelting of the zinc oxide sinter to produce metallic zinc. Sulfur from the first phase of the process was recovered and converted into sulfuric acid. Much of the equipment associated with sulfuric acid production either was constructed of lead or was lead-lined. An on-site lead burner was used to manufacture and repair lead components. Other metals were also present in the zinc ore as impurities, including lead and cadmium.

A narrow-gauge, on-site industrial railroad was used to move the ore about the Site, with locomotives that ran on gasoline. The machinery, engine oils, and underground storage tanks containing gasoline all contributed volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) to the Site.

During at least part of the time that the Matthiessen and Hegeler Zinc Company operated at OU2, it generated its own electrical power for use in the zinc refining plant and coal mine. Polychlorinated biphenyls (PCBs) were commonly used in electrical transformers manufactured between 1929 and 1977. Additional potential sources of PCBs include lubricating and hydraulic oils that may have been used in on-site equipment.

Pesticides may also have been used during Site operations. It was a common practice in the mid-1900s to spray herbicides to control vegetation near railroads, three of which were located on the Site, mainly on OU2: the Illinois Central Railroad on the east, the LaSalle and Bureau County Railroad on the west, and the on-site narrow-gauge industrial railroad previously mentioned.

Asbestos was used as a building material (transite walls and roofs, as thermal insulation and fire proofing) in many of the 150 buildings found on OU2. In addition, steam pipes that traversed OU2 were wrapped in asbestos-type insulation.

Enforcement Activities

In 1991, IEPA performed a Preliminary Assessment and Screening Site Inspection of OU1. Subsequently, IEPA conducted another CERCLA Preliminary Assessment in 1993 and a CERCLA Integrated Assessment in 1994 to evaluate the contaminant sources at the Site. From 1992 through 1994, Carus's contractor, Geosyntec, further investigated the contamination at OU1.

EPA proposed the Site to the National Priorities List (NPL) on June 14, 2001, and finalized the Site on the NPL on September 29, 2003. Two primary on-site sources were used to score the Site for the NPL: (1) the large slag and sinter pile located at OU1; and (2) a shallow waste pile of slag and sinter heterogeneously deposited throughout the former smelter property at OU2.

In 2003-2004, EPA oversaw a time-critical removal action at the LaSalle Rolling Mill portion of OU2 to address cyanide and asbestos contamination, old plating line waste and various other chemicals and storage tanks that remained after the mill ceased metal rolling activity. The removal action was conducted by Fred Carus under a September 2003 Administrative Order on Consent (AOC) with EPA.

Following negotiations for the RI/FS, EPA entered into an Administrative Settlement and Agreement on Order of Consent (ASAOC) with Carus in September 2006. Under the ASAOC, Carus conducted the RI/FS work at OU1 and EPA conducted the RI/FS work at OU2. The ASAOC required a single, comprehensive RI Report, Risk Assessment Report,

and FS Report for the Site. The RI work at the Site began in 2007. For OU1, Carus sampled soil, slag, groundwater, surface water, sediment, and air during the period 2007-2009. For the investigations conducted at OU2, EPA sampled soils, building materials, debris piles, groundwater, surface water, and air during the period 2007-2010.

In response to asbestos being encountered during the RI around the rolling mill (OU2), in 2008 EPA tasked the Superfund Technical Assessment and Response Team (START) contractor to conduct another removal assessment at the Site. The assessment activities included investigating unknown chemicals in a former laboratory building, conducting asbestos sampling at multiple buildings, and investigating unknown oil in sewer drains. In 2009, EPA issued a Unilateral Administrative Order (UAO) to Fred Carus and LaSalle Acres, Inc. for the removal of asbestos-containing material, cadmium, and zinc at and around the rolling mill building and demolition of a former chemical laboratory building. After the parties failed to comply with the UAO, EPA tasked the START contractor to conduct the time-critical removal action, and the work was completed in 2009.

2.3 Community Participation

EPA solicited input from the City of LaSalle on current zoning and planned future uses for areas of the Site. EPA issued the Proposed Plan for the Site on October 5, 2015. In response to the community, EPA held two formal public meetings and an availability session to update the community on the findings of the RI, the alternatives evaluated in the FS, and to present EPA's preferred remedial options for the Site.

2.4 Scope and Role of Operable Unit or Response Action

The Site was split into two OUs during the RI/FS because there were different parties performing the RI/FS work at each OU. The Selected Remedy addresses both OUs and is the final remedy for the Site. Any sequencing of the remedial action work is not anticipated to be carried out based on the OU designations. As noted earlier, two prior removal actions have been conducted at OU2: one under a 2003 AOC to address concerns at the rolling mill, and a second by EPA in 2009 to address additional concerns near the rolling mill.

The Selected Remedy will meet all of the remedial action objectives (RAOs) that were developed for the Site. As noted in Section 1.4 of this ROD, EPA will re-evaluate the interim lead cleanup levels selected in this ROD and will document any changes to the lead cleanup levels in an appropriate future decision document. The response action selected in this ROD does not address site groundwater because EPA believes that groundwater does not warrant a CERCLA response action now or in the future (as discussed later in this document).

2.5 Site Characteristics

Hydrology, Geology, and Hydrogeology

The Site has two different water-bearing zones (WBZs) – one shallow and one deeper. Regionally, aquifers are represented by sands and gravels within surficial glacial deposits and the underlying permeable sandstone and limestone bedrock formations. The City of LaSalle has a municipal well field approximately 0.75 mile south of the Site that derives water from the glacial sands and gravels at 60 to 70 feet below ground surface (ft bgs). The City of Peru has a municipal well field approximately 2 miles southwest of the Site that derives water from bedrock formations located at more than 2,000 ft bgs. The groundwater investigation at the Site focused on a much shallower water-bearing zone (at 20 to 50 ft bgs) and not on the regional aquifers used by these nearby municipalities. Site-related activities have not impacted the deep bedrock formation since the shallow groundwater system does not connect with the deeper aquifer.

The shallow water-bearing zone at the Site, denoted as WBZ1, consists of unconsolidated materials and is typically found to a depth of 20 ft bgs. Shallow groundwater at a number of WBZ1 wells was encountered within 10 feet of the ground surface. These unconsolidated materials consist of Quaternary-aged sands, gravels, silts, and clays (also known as glacial till), and artificial fill materials (slag, sinter, brick, reworked soils, and site geologic materials). WBZ1 is unconsolidated and discontinuous, and is composed of separate and irregular lenses of water in the subsurface. Groundwater in WBZ1 generally flows to the east and southeast, toward the LVR.

WBZ2 consists of the underlying Pennsylvanian-aged shale bedrock and the top (typically 0 to 3 feet) of Pennsylvanian-aged limestone bedrock. Like WBZ1, the groundwater in WBZ2 generally flows to the east and southeast, toward the LVR. The weathered and fractured upper portions of the bedrock are likely more permeable than the intact rock, with the intact lower-permeability bedrock acting as a base to the water table hydrogeologic system. Deeper, more intact portions of the Pennsylvanian system are judged to effectively isolate the surface groundwater system from deeper water supply aquifers. The hydraulic conductivity data indicate there are no significant, widely-distributed, low-permeability horizons above the bedrock surface. This absence of aquitards suggests the two WBZs at the Site may be acting as a single interconnected system.

The RI identified contaminants of interest based on comparisons to potable water screening values, including those for Class I - Potable Resource Groundwater as defined by IEPA regulations, because at the time of the RI groundwater at the Site had not yet been classified by the State. IEPA subsequently classified the groundwater within WBZ1 and WBZ2 as Class II - General Resource Groundwater because the majority of groundwater wells in WBZ1 and WBZ2 do not meet the criteria for Class I - Potable Resource Groundwater (e.g., they have low hydraulic conductivity, shallow depth to water, etc.) as defined in 35 Illinois Administrative Code (IAC) 620.210.

Class II - General Resource Groundwater is defined in 35 IAC 620.220 as groundwater that does not meet the criteria of the other three classes and that is “capable of agricultural, industrial, recreational, or other beneficial uses.” The City of LaSalle has an existing ordinance (Ordinance Number 1755, dated January 16, 2002) prohibiting the drilling of water supply wells throughout the city. The city ordinance covers the Site and adjacent areas. In a January 2002 Memorandum of Understanding (MOU), IEPA accepted this ordinance as an IC for protection from risks from impacted groundwater.

The surface water features at the Site are not considered jurisdictional wetlands because they are isolated depressions with no connection to a jurisdictional water body. Additionally, hydric soil characteristics are absent at OU2 surface water locations, and none of the mapped soils are classified as hydric soils.

Investigation Findings

For purposes of the risk assessment and the FS, the two OUs at the Site were further subdivided into different exposure areas (EAs) in order to evaluate the Site in terms of risk.

Operable Unit 1

OU1 was subdivided into three different EAs for risk assessment purposes, as shown in Figure 3:

- Carus Plant Area
- Slag Pile Area
- Little Vermilion River

At OU1, the primary contaminants of concern found in surface and subsurface soil samples were metals and, to a lesser extent, SVOCs and PCBs. The number of exceedances for SVOCs and PCBs and their horizontal and vertical distribution were less than for metals. In addition, several, though not all, of the SVOC and PCB exceedances were from samples collected in the early 1990s during the state’s Preliminary Assessment. At the Carus Plant Area, analytical results generally indicated that surface soils located 0 to 2 ft bgs contained higher contaminant concentrations and a greater extent of contamination when compared to subsurface samples (greater than 2 ft bgs). COCs at the Carus Plant Area were limited to metals, SVOCs, and PCBs (a single pre-1994 sample contained PCBs) in surface soils, with only metals detected above the screening levels in subsurface soils. At the Slag Pile Area, both metals and SVOCs were present above screening values in both surface and subsurface samples. Table 1 contains all of the COCs identified at the Site.

A select number of soil and slag samples from OU1 were analyzed for toxicity characteristic leaching procedure (TCLP) metals. Some of the slag pile samples’ analyte concentrations exceeded the maximum concentration of contaminants for the toxicity characteristic regulatory levels, which identifies those soil samples as being characteristically hazardous due to toxicity.

The following is a subset of the most relevant contaminants and their associated maximum concentrations within various media at each OUI EA.

Carus Plant Area

- The maximum arsenic concentration in shallow soil was 33.6 milligrams per kilogram (mg/kg)
- The maximum arsenic concentration in deep soil was 50.5 mg/kg
- The maximum manganese concentration in shallow soil was 118,000 mg/kg
- The maximum manganese concentration in deep soil was 9,380 mg/kg
- The maximum lead concentration in shallow soil was 3,660 mg/kg
- The maximum lead concentration in deep soil was 510 mg/kg
- The maximum benzo(a)pyrene concentration in shallow soil was 1,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$)

Slag Pile Area

- The maximum arsenic concentration in shallow soil was 251 mg/kg
- The maximum arsenic concentration in deep soil was 117 mg/kg
- The maximum lead concentration in shallow soil was 38,700 mg/kg
- The maximum lead concentration in deep soil was 3,850 mg/kg
- The maximum manganese concentration in shallow soil was 123,000 mg/kg
- The maximum manganese concentration in deep soil was 40,600 mg/kg

Little Vermilion River

- The maximum mercury concentration in sediment was 0.53 mg/kg
- The maximum zinc concentration in surface water was 1,960 micrograms per liter ($\mu\text{g}/\text{L}$)
- The maximum lead concentration in surface water was 2.9 $\mu\text{g}/\text{L}$

Operable Unit 2

OU2 was subdivided into seven different EAs for risk assessment purposes, as shown in Figure 4:

- EA1 – Main Industrial Area (also known as the “MIA” or “Main Plant Area” on some figures and tables)
- EA2 – North Area (also known as Wooded Area - North)
- EA3 – Wooded Area - Northeast
- EA4 – Building 100 Area (also known as “Building 100 hot spot” or “B100”)
- EA5 – Rolling Mill Area
- EA6 – Off-Site Residential Area
- EA7 – Off-Site Mixed Use Area

In general, analytical results indicated that surface soil at OU2 contains higher contaminant concentrations and a greater extent of contamination than subsurface soil.

A select number of soil samples from the Main Industrial Area of OU2 were analyzed for TCLP metals, since this area of OU2 contains large amounts of sinter and slag. Some of the Main Industrial Area samples' analyte concentrations exceeded the maximum concentration of contaminants for the toxicity characteristic regulatory levels, which identifies those soil samples as being characteristically hazardous due to toxicity. TCLP analysis was not conducted on samples from the other areas of OU2 due to the general lack of sinter and slag in those areas.

A PCB hot spot was found in surface and subsurface soil around Building 100. This was the only area at the Site where elevated concentrations of PCBs were found in the soil at depth during the RI.

A trichloroethylene (TCE) hot spot was found in an area near the corner of the rolling mill in surface soil, subsurface soil, and groundwater. The potential for vapor intrusion was evaluated in the risk assessment to determine the potential for unacceptable risks to human health from vapor intrusion into the rolling mill building. Based on this assessment, EPA determined that additional data is needed to identify potential risks associated with vapor intrusion within the rolling mill building. This data will be collected during the remedial design phase. If this data shows that vapor intrusion presents a risk, the Selected Remedy may be changed to address TCE and vapor intrusion within the rolling mill, or EPA and/or IEPA may address the risk through a separate action.

Since asbestos was detected in surface soil at OU2, activity-based sampling (ABS) and releasable asbestos field sampler (RAFS) investigations were conducted in 2009 to assess the risk of airborne asbestos to workers and nearby residents. Air samples were collected from four outdoor locations where previously-collected soil samples had analytical asbestos results near the 1 percent concentration threshold, in accordance with EPA's asbestos guidance. Areas with soil asbestos concentrations much greater than the 1 percent threshold were not proposed for ABS or RAFS sampling because human exposure risks are expected and assumed to be highest. For the locations that were sampled (i.e., the locations with asbestos soil sample results near 1 percent), none of the air sample results showed asbestos above the detection limit of 0.005 to 0.006 fibers per cubic centimeter.

The following is a subset of the most relevant contaminants and their associated maximum concentrations within various media at each OU2 EA.

Main Industrial Area – Soils

- The maximum arsenic concentration in surface soil was 810 mg/kg
- The maximum arsenic concentration in subsurface soil was 528 mg/kg
- The maximum cadmium concentration in surface soil was 1,020 mg/kg
- The maximum cadmium concentration in subsurface soil was 770 mg/kg
- The maximum lead concentration in surface soil was 209,000 mg/kg
- The maximum lead concentration in subsurface soil was 62,600 mg/kg
- The maximum mercury concentration in surface soil was 154 mg/kg

- The maximum mercury concentration in subsurface soil was 145 mg/kg
- The maximum zinc concentration in surface soil was 218,000 mg/kg
- The maximum zinc concentration in subsurface soil was 98,100 mg/kg
- The maximum benzo(a)anthracene concentration in surface soil was 71,000 µg/kg
- The maximum benzo(a)anthracene concentration in subsurface soil was 29,000 µg/kg

North Area – Soils

- The maximum arsenic concentration in surface soil was 129 mg/kg
- The maximum arsenic concentration in subsurface soil was 61.4 mg/kg

Wooded Area - Northeast – Soils

- The maximum lead concentration in surface soil was 212 mg/kg
- The maximum zinc concentration in subsurface soil was 596 mg/kg

Building 100 Area - Soils

- The maximum arsenic concentration in surface soil was 217 mg/kg
- The maximum arsenic concentration in subsurface soil was 257 mg/kg
- The maximum lead concentration in surface soil was 14,500 mg/kg
- The maximum lead concentration in subsurface soil was 13,200 mg/kg
- The maximum Aroclor-1260 PCB concentration in surface soil was 210,000 µg/kg
- The maximum Aroclor-1260 PCB concentration in subsurface soil was 39,000 µg/kg

Rolling Mill – Soils

- The maximum arsenic concentration in surface soil was 66 mg/kg
- The maximum arsenic concentration in subsurface soil was 93.7 mg/kg
- The maximum lead concentration in surface soil was 9,410 mg/kg
- The maximum lead concentration in subsurface soil was 10,700 mg/kg
- The maximum TCE concentration in surface soil was 210 µg/kg
- The maximum TCE concentration in subsurface soil was 120,000 µg/kg

Off-Site Residential Area – Soils

- The maximum arsenic concentration in surface soil was 51.2 mg/kg
- The maximum lead concentration in surface soil was 3,220 mg/kg
- The maximum cadmium concentration in surface soil was 120 mg/kg

Off-Site Mixed Use Area – Soils

- The maximum lead concentration in surface soil was 145 mg/kg
- The maximum zinc concentration in subsurface soil was 1,120 mg/kg

Site-wide Groundwater

Since different parties were conducting the OU1 and OU2 RI work, the groundwater at OU1 and OU2 was investigated separately. The maximum contaminant concentrations in groundwater at each OU are listed below.

Groundwater Beneath OU1

- The maximum arsenic concentration in groundwater beneath the Carus Plant Area was 21.1 µg/L
- The maximum arsenic concentration in groundwater beneath the Slag Pile Area was 57.2 µg/L

Groundwater Beneath OU2

- The maximum TCE concentration in groundwater (located near the rolling mill) was 230 µg/L
- The maximum naphthalene concentration in groundwater (located near Building 100) was 37 µg/L
- The maximum arsenic concentration in groundwater was 24.2 µg/L

For OU1, the primary COCs found in groundwater samples were metals and, to a limited extent, VOCs and SVOCs. The RI identified metals, two VOCs (in a single sample), and one SVOC (also in a single sample) as COCs in groundwater samples collected from the Carus Plant Area; COCs in groundwater samples collected from the Slag Pile Area were metals only.

Regarding the groundwater at OU2, samples from WBZ1 wells in OU2 contained higher concentrations of contaminants (primarily metals) than samples from WBZ2 wells. WBZ1 wells are screened in unconsolidated overburden materials, primarily at shallow depths. Therefore, WBZ1 wells are closer to surface soil contamination and surface discharges. The highest metals concentrations were detected in groundwater samples from WBZ1 wells in the OU2 Main Industrial Area. Polycyclic aromatic hydrocarbons (PAHs) were detected near former aboveground storage tanks, northeast of Building 100. TCE was detected in OU2 groundwater near the rolling mill building along the southern boundary of OU2. For both PAHs and VOCs, detections were localized.

Conceptual Site Model

The conceptual site models (CSMs) for OU1 and OU2 are presented in Figures 5 and 6, respectively. These CSMs illustrate the fate and transport of contaminants in each OU through various media and the potential exposure to receptors.

Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) are risk-based, background-based, or ARAR-based chemical-specific concentrations that help further define the RAOs and that are used in developing and evaluating potential cleanup alternatives for a site. PRGs are

considered “preliminary” remediation goals until a remedy is selected in a ROD. The ROD establishes the final remedial goals and/or cleanup levels.¹

EPA developed PRGs² for the Site based on the RAOs listed in Section 2.7 of this ROD. The PRGs, which are listed on page 1 of Table 2, are based on both protective risk-based concentrations (considering the risk range of 1E-04 to 1E-06) and a review of potential federal and state ARARs. With the exception of lead (discussed below) and arsenic in the Off-Site Residential Area (also discussed below), EPA selected PRGs (and ultimately cleanup levels) based upon 1E-05 risk levels. EPA made this decision after considering the cost-effectiveness of each alternative using cleanup levels of 1E-04, 1E-05, 1E-06, and background. Cost-effectiveness is discussed below and in Section 2.13 of this ROD.

For lead in soil, health-based PRGs were calculated for residential and commercial/ industrial receptors using EPA’s Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children and the Adult Lead Methodology (ALM), respectively. Using the then-current default input parameters, the resulting PRGs for lead in soil were 400 mg/kg for residential properties and 800 mg/kg for commercial/industrial properties.

As discussed below in Section 2.6, EPA also performed limited site-specific bioavailability testing for lead and arsenic in the residential area to determine the relative bioavailability (RBA) of those metals to receptors in the community. After evaluating the results, EPA decided to use the default RBA value for both lead and arsenic rather than the site-specific bioavailability data. This resulted in soil PRGs of 400 mg/kg (residential) and 800 mg/kg (commercial/ industrial) for lead and 18 mg/kg for arsenic³ (residential).

When establishing the arsenic PRG for properties with current or future residential land use, EPA evaluated a range of potential PRGs. EPA considered PRGs based on excess lifetime cancer risk levels of 1E-06, 1E-05, and 1E-04, a non-cancer hazard index (HI) of 1, and site-specific background concentrations (11.8 mg/kg). Arsenic PRGs based on risk levels of 1E-06 and 1E-05 are below background and not achievable, so PRGs based on those risk levels were ruled out. An arsenic PRG based on an HI of 1 is lower (more protective) than a PRG based on a risk level of 1E-04, so the 1E-04 risk level was ruled out. A PRG based on site-specific background concentrations is lower (and more protective) than one based on an HI of 1. The risk levels associated with PRGs based on site-specific background and an HI of 1 are as follows:

Basis	Arsenic Concentration	Risk Level
Background	11.8 mg/kg	5E-05
HI = 1	18 mg/kg	8E-05

¹ As noted in Section 1.4 of this ROD, the cleanup levels for lead selected in this ROD are interim cleanup levels.

² It should be noted that the FS Report mistakenly used the term “Remedial Action Levels” (RALs) instead of “Preliminary Remediation Goals” (PRGs).

³ The arsenic PRG of 18 mg/kg is different than the PRG reflected in the FS Report. See November 7, 2014 Technical Memorandum (included in Administrative Record file) for a detailed discussion of the arsenic PRG.

Both of the above potential PRGs are within the acceptable risk range – they both fall between excess lifetime cancer risk levels of 1E-05 to 1E-04 – and the difference between their risk estimates is minimal. After evaluating the cleanup alternatives against the NCP evaluation criteria described below (see Section 2.10, “Comparative Analysis of Alternatives”), and considering the need to make a cost-effectiveness finding, EPA made the risk-management decision to propose an arsenic PRG of 18 mg/kg. EPA concluded that the \$10 million cost increase associated with a PRG based on background is significant and would result in only limited risk reduction. The proposed arsenic PRG of 18 mg/kg would result in a cleanup that is both protective of human health and cost-effective.

Based on the sampling conducted during the RI, and using an arsenic PRG of 18 mg/kg and a lead PRG of 400 mg/kg, approximately 2,800 of the residential properties in the Off-Site Residential Area portion of OU2 were estimated to require cleanup.

2.6 Summary of Site Risks and Current and Potential Future Land Use

This section summarizes the risks to human health and the environment that are posed by the contamination.

A baseline risk assessment estimates what risks a site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by a remedial action. The risk assessment included the following elements:

- OU1 baseline human health risk assessment (HHRA)
- OU1 screening level ecological risk assessment (SLERA)
- OU1 baseline ecological risk assessment (BERA)

- OU2 HHRA
- OU2 SLERA
- OU2 BERA

Prior to conducting the risk assessment, Geosyntec and SulTRAC (consultants for Carus [OU1] and EPA [OU2], respectively) jointly prepared and submitted a technical approach Consensus Document describing risk assessment methodologies for the HHRAs, SLERAs, and BERAs. The Consensus Document underwent extensive review and comment prior to being approved by EPA and IEPA. Use of the Consensus Document helped ensure that risk assessment methodologies and results for OUs 1 and 2 would be comparable. While OU-specific risks and hazards were prepared and discussed, both the human health and ecological risk assessments identified and evaluated potential exposure of receptors to chemical contamination at both OUs.

Human Health Risks

The risk assessment evaluated both cancer risks and non-cancer hazards. The likelihood of any kind of cancer resulting from exposure to carcinogens at a Superfund site is generally expressed as an upper bound incremental probability, such as a “1 in 10,000 chance” (expressed in scientific notation as 1E-04). In other words, for every 10,000 people exposed to the site contaminants under reasonable maximum exposure conditions, one extra cancer may occur as a result of site-related exposure. This is referred to as an “excess lifetime cancer risk” because it would be in addition to the risk of cancer individuals face from other causes such as smoking or too much sun. The risk of cancer from other causes has been estimated to be as high as one in three. The potential for non-cancer health effects is evaluated by comparing an exposure level over a specified time period (such as a lifetime) with a “reference dose” derived for a similar exposure period. A reference dose represents a level that is not expected to cause any harmful effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ < 1 indicates that the dose from an individual contaminant is less than the reference dose, so non-cancer health effects are unlikely. The HI is generated by adding the HQs for all COCs that affect the same target organ (such as the liver). An HI < 1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, non-cancer health effects from all contaminants are unlikely. An HI > 1 indicates that site-related exposures may present a risk to human health. EPA’s acceptable risk range is defined as a cancer risk range of 1E-06 to 1E-04 and an HI < 1. Generally, remedial action at a site is warranted if cancer risks exceed 1E-04 and/or if non-cancer hazards exceed an HI of 1.

In the summary information presented below, the OU-specific EAs are identified first. Second, the joint and OU-specific exposed populations (receptors) are identified. Third, non-standard or unique receptors, exposure assumptions, and exposure scenarios are discussed. Finally, OU-specific risks and hazards under both current and future land use conditions are summarized. Much more detail regarding the HHRA is available in the AR file for the Site.

Exposure Areas

As noted earlier, OU1 and OU2 were both divided into multiple EAs to evaluate current and potential future exposures, as follows:

OU1 Exposure Areas (see Figure 3)

- Carus Plant Area
- Slag Pile Area
- LVR

OU2 Exposure Areas (see Figure 4)

- Main Industrial Area (EA1)
- North Area (EA2) (also known as Wooded Area - North)
- Wooded Area - Northeast (EA3)
- Building 100 Area (EA4)

- Rolling Mill Area (EA5)
- Off-Site Residential Area (EA6)
- Off-Site Mixed Use Area (EA7)

Exposed Populations (Receptors)

As part of the Consensus Document, a series of joint (i.e., evaluated at both OUs) human receptors, as well as a limited number of OU-specific human receptors, were identified. The joint and OU-specific receptors are identified below.

Joint Receptors

- Commercial/industrial workers (assumed to be adults; under current conditions, these receptors are Carus' employees at OU1).
- Utility workers (assumed to be adults).
- Construction workers (assumed to be adults).
- Trespassers (both adolescents and adults were evaluated).
- Recreationalists (children, adolescents, and adults were evaluated).
- Residents (child and aggregate [time-weighted] residents were evaluated). At OU1, a residential exposure scenario was termed "hypothetical" because replacement of Carus' operations by a residential scenario is very unlikely. Within OU2, EA6 is a current residential area, and at EA2, potential residential development under future land use conditions was evaluated but later determined to be very unlikely.

OU-Specific Receptors

OU-specific receptors were evaluated only at OU1 and include the following:

- Site-specific worker (OU1 workers exposed at the Slag Pile Area; non-traditional exposure).
- Recreational shoreline angler (both adolescent and adult anglers were evaluated).
- Fish consumer (child, adolescent, and adult fish consumers were evaluated).

Non-standard or Unique Receptors, Exposure Assumptions, and Exposure Scenarios

All joint and OU-specific receptors were evaluated, to the extent possible, using standard and approved federal and Illinois assumptions, based on *Risk Assessment Guidance for Superfund* and Illinois' "Tiered Approach to Corrective Action Objectives" guidance documents and directives, respectively. For many receptors (including site-specific workers, trespassers, recreationalists, and recreational shoreline anglers), the primary non-standard exposure assumption was the exposure frequency – the number of days these receptors were assumed exposed each year. While non-standard, the receptor-specific exposure frequency assumptions used for these receptors were informed by assumptions regarding similar receptors at other EPA Region 5 sites, while incorporating

site-specific conditions (for example, the unique situation of the very large slag pile inspected by the site-specific OUI worker).

EPA considered a number of potential assumptions regarding the RBA for lead and arsenic when evaluating potential exposure to those COCs in soil (including slag and sinter where present). The risk assessment discusses evidence of reduced bioavailability of arsenic in slag and sinter (unique to a former smelting operation). However, while this claim of reduced arsenic bioavailability is compelling in many regards, neither within the State of Illinois nor nationally has agreement been reached concerning the level or application of RBA of arsenic in sinter and slag. For the final risk assessment report, an arsenic RBA of 0.8 was applied. However, in December 2012, EPA released guidance entitled *Recommendations for Default Value for Relative Bioavailability of Arsenic in Soil*, which recommended a default RBA of 0.6 (60%) for arsenic in soil. The EPA-recommended default RBA values of 0.6 for arsenic and lead were ultimately used in developing site-specific PRGs.

During agency review of the FS, EPA decided to conduct site-specific bioavailability testing to compare the default RBA numbers that were used in calculating PRGs for both arsenic and lead to site-specific soil samples from the Off-Site Residential Area. In 2014, individual properties were selected for sampling based primarily on lead concentrations in soil. Ten residential properties and two alternate properties were selected for sample collection. Based on the sample results, the site-specific lead RBA was calculated as 0.507 (50.7%) based on the mean of 9 property-specific values. An arsenic RBA was calculated for only four of the 10 total soil samples because only those four had useable arsenic results. As a result, the arsenic RBA was considered as the highest available result, 0.369 (36.9%). For both lead and arsenic, the calculated site-specific RBA value was less than the default EPA-recommended value. For arsenic, all of the sample-specific RBA results (which ranged from 0.273 to 0.369 [27.3% to 36.9%]) were less than the EPA-recommended default value of 0.6. The majority of the sample-specific lead RBA results also were less than the EPA-recommended value of 0.6, while the maximum sample-specific lead RBA result (0.621) was similar to the EPA-recommended default value. Ultimately, EPA decided to use the EPA-recommended default RBA value of 0.6 (60%) when calculating soil PRGs for both arsenic and lead for two primary reasons: (1) based on the small sample size, the calculated site-specific RBAs could theoretically underestimate the actual RBAs; and (2) given the uncertainty, use of the higher EPA-recommended default RBAs would result in more health-protective (lower) soil PRGs. EPA may reconsider the lead RBA value when it re-evaluates, during the remedial design phase, the interim lead cleanup levels selected in this ROD.

EPA also used site-specific risk assessment assumptions regarding exposure frequencies (EFs) and fractional uptakes (FIs). For the inhalation and dermal exposure pathways only, the EF was reduced from the default of 350 days per year to 275 days per year to account for frozen ground and/or snow cover conditions during winter, when limited or no exposure via dermal contact with soil or incidental inhalation of soil would occur. The FI for homegrown produce was reduced from 1.0 to 0.5 (the central tendency value) to

reflect site-specific conditions, as the area surrounding the Site is highly agricultural and many residents ingest home-grown produce from their gardens and local markets.

OU-Specific Risks and Hazards

The various COCs for the Site are included in Table 1 for the various media and exposure scenarios evaluated in the risk assessment. The results of the risk assessment for each OU are summarized below. A complete set of risk tables from the HHRA is provided in Appendix 1. As noted earlier, a variety of land uses and potential receptors were considered. The current and/or most likely future land uses and associated receptors are **bolded and underlined** in the information summarized below.

OU1

Carus Plant Area – soils

- Cancer risks within or below the acceptable risk range (1E-06 to 1E-04) for worker scenarios
- Non-cancer hazards > 1 for worker scenarios (1.3 to 20 for manganese and mercury)
- Lead concentrations > 800 mg/kg in 2 of 32 samples
- Land uses: **commercial/industrial** (active industrial facility)
- Receptors: **commercial/industrial worker**, utility worker, and construction worker
- Exposure route: ingestion, direct contact, inhalation

Slag Pile Area – soils

- Cancer risks within the acceptable risk range for all receptors evaluated
- Non-cancer hazards > 1 for worker scenarios (2.1 to 31 for manganese and lead)
- Lead concentrations > 800 mg/kg in about half of samples
- Land uses: **commercial/industrial**
- Receptors: **commercial/industrial worker, utility (e.g., maintenance) worker, construction worker**, and trespasser
- Exposure route: ingestion, direct contact, inhalation

LVR

- Sediment and surface water cancer risks within or below the acceptable risk range
- Sediment and surface water non-cancer hazards < 1
- Fish consumption cancer risks within or below the acceptable risk range
- Fish consumption non-cancer hazards > 1 (2 for mercury, based on maximum fileet concentration and reasonable maximum exposure assumptions, but concentrations consistent with natural background)
- Land uses: **recreational**
- Human Receptors: **recreational anglers**, fish consumers

- Ecological Receptors: **macroinvertebrates, fish, riparian (shoreline) birds and mammals**
- Exposure route: ingestion, direct contact

OU2

Main Industrial Area – soils

- Cancer risks exceed 1E-04 for utility workers (2E-04)
- Cancer risks within the acceptable risk range for other worker scenarios
- Non-cancer hazards > 1 for all worker scenarios (5.9 to 240 for metals, TCE, and PCBs)
- Lead presents risk to all workers and child recreationalists
- Asbestos risk under non-intrusive scenarios to commercial/industrial worker only
- Land uses: **commercial/industrial** and recreational
- Receptors: **commercial/industrial worker, utility worker, construction worker**, trespasser, and recreationalist
- Exposure route: ingestion, direct contact, inhalation

North Area - soils

- Cancer risks within the acceptable risk range for all workers
- Non-cancer hazards > 1 for worker scenarios (1.6 for commercial/industrial, but < 1 and insignificant when segregated by target organs; 4.0 for future construction worker driven by incidental ingestion of zinc)
- Cancer risks and non-cancer hazards exceed the acceptable risk range for future residents, but a future residential scenario was later determined not to be realistic
- Lead presents risk to construction workers (and future residents as was initially evaluated in the FS)
- Land uses: **commercial/industrial** and recreational; future residential was also evaluated but later ruled out
- Receptors: **commercial/industrial worker, utility worker, construction worker**, trespasser, and recreationalist; future residents were also evaluated but later ruled out
- Exposure route: ingestion, direct contact, inhalation

Wooded Area - Northeast – soils

- Cancer risks within the acceptable risk range for all workers and child recreationalists
- Non-cancer hazards > 1 for construction worker only (3.5 for incidental ingestion of arsenic)
- Lead presents risk to construction workers only
- Land Uses: **recreational**
- Receptors: **recreationalist, utility worker, construction worker**, and trespasser
- Exposure route: ingestion, direct contact, inhalation

Building 100 Area - soils

- Cancer risks exceed 1E-04 for commercial/industrial workers (both non-intrusive workers contacting only surface soil [3E-04] and intrusive workers contacting subsurface soil [2E-04])
- Cancer risks within acceptable risk range for all other receptors
- Non-cancer hazards > 1 for commercial/industrial worker and child recreationalists (1.3 to 62 for PCBs and metals)
- Lead presents risk to workers and child recreationalists
- Asbestos risk under non-intrusive scenarios to commercial/industrial workers only
- Land uses: **commercial/industrial** and recreational
- Receptors: **commercial/industrial worker, utility worker, construction worker**, recreationalist, and trespasser
- Exposure route: ingestion, direct contact, inhalation

Rolling Mill Area – soils

- Cancer risks within the acceptable risk range for all workers and child recreationalists
- Non-cancer hazards > 1 for all workers (2.6 to 200 for PCBs and metals)
- Lead presents risk to workers and child recreationalists
- Land uses: **commercial/industrial** and recreational
- Receptors: **commercial/industrial worker, utility worker, construction worker**, recreationalist, and trespasser
- Exposure route: ingestion, direct contact, inhalation

Off-Site Residential Area - soils

- Cancer risks for residents exceed 1E-04 at 26 of the 185 properties tested (2E-04 to 6E-04, driven primarily by arsenic)
- Cancer risks within the acceptable risk range for all workers
- Non-cancer hazards > 1 for construction workers (2.8 for incidental ingestion of arsenic)
- Non-cancer hazards > 1 for residents, related primarily to zinc and to a lesser degree arsenic, antimony, cadmium, and manganese (1.1 to 64 for metals in homegrown produce)
- Lead concentrations > 400 mg/kg at 46 of the 185 properties tested
- Land uses: **residential**
- Receptors: **resident, utility worker, and construction worker**
- Exposure route: ingestion, direct contact, inhalation

Off-Site Mixed Use Area – soils

- Cancer risks within or below the acceptable risk range for all receptors
- Non-cancer hazards < 1 for all receptors
- Lead poses no risk to any receptor
- Asbestos poses no risk to any receptor
- Land Uses: **residential**

- Receptors: **resident, utility worker, and construction worker**
- Exposure route: ingestion, direct contact, inhalation

Groundwater

The State of Illinois has classified the groundwater at the Site as Class II - General Resource Groundwater. The groundwater at the Site is not used as a source of potable water; no groundwater supply wells are present at either OU1 or OU2. Further, a City of LaSalle ordinance, in conjunction with an MOU between the City of LaSalle and Illinois EPA, legally prohibits drilling of water wells at both OU1 and OU2 in order to obtain a water supply. Nevertheless, the risk assessment evaluated hypothetical future ingestion, dermal, and inhalation exposure pathways assuming potable groundwater use to provide risk managers with quantitative risk and hazard calculations to support the evaluation of risk management measures regarding groundwater at the Site. (Even the future commercial/industrial worker scenarios assumed potable use of site groundwater.) Cumulative risk from ingestion, dermal, and inhalation pathways were calculated in the risk assessment, but are not considered complete current or possible future pathways and, therefore, were not further considered for risk management decision-making. While groundwater was ultimately evaluated on a site-wide basis, the risk assessment for each OU evaluated the groundwater beneath that specific portion of the Site and can be found in the Risk Assessment section of the RI Report.

Ecological Risk

As with the HHRA, separate ecological risk assessments were completed for OU1 and OU2. The results for each operable unit are summarized below.

OU1

OU1 was divided into three ecological habitats (see Figure 3): Carus Plant Area, Slag Pile Area, and LVR.

Carus Plant Area

The results of the SLERA for the Carus Plant Area indicated that concentrations of several constituents, primarily metals, in surface soil exceeded ecological screening values (ESVs), which was the SLERA metric for predicting potential adverse effects on terrestrial wildlife receptors. Maximum HQs for most metals were above the EPA threshold value of 1, and in several instances, maximum HQs approached or exceeded 100. Given the magnitude of the HQs at the Carus Plant Area, it was considered unlikely that the potential for ecological risk could be attributed to the conservative assumptions or inherent uncertainties of the SLERA. Therefore, additional evaluation (e.g., a BERA) was not conducted for this area. However, as an industrial use property, the Carus Plant Area has and will continue to have minimal value as ecological habitat. Consequently, potential risks to terrestrial ecological receptors do not warrant further consideration in the identification of PRGs for this portion of the Site.

Slag Pile Area

The Slag Pile Area is composed of waste material generated from the primary zinc smelting process. Relative to the natural landscape, the Slag Pile Area inherently represents highly-disturbed habitat. Results of the SLERA for surface soil at the Slag Pile Area indicate that concentrations of several constituents, primarily metals, exceed ESVs. Maximum HQs for most metals were above the EPA threshold value of 1, and in several instances, maximum HQs approached or exceeded 100. Given the magnitude and widespread distribution of these metals at the Slag Pile Area, it was considered unlikely that the potential for ecological risk could be attributed to the conservative assumptions or inherent uncertainties of the SLERA. Therefore, a BERA was not conducted for this area. To evaluate whether future vegetation and support of ecological receptors is feasible, a 21-day lettuce seed germination test was conducted during the RI. The results of the phytotoxicity test indicate Slag Pile Area soils are unlikely to support vegetation.

LVR

Results of the SLERA indicated that concentrations of constituents, primarily metals, in the sediment and surface water of the LVR exceed ESVs for benthic and aquatic receptors. Based on the habitat characterization, the LVR was identified as the most ecologically-valuable habitat associated with the Site. Therefore, further evaluation in a BERA was conducted for the riverine/riparian habitat of the LVR.

The BERA emphasized site-specific approaches (e.g., measurement endpoints) to characterize ecological effects on selected assessment endpoints. Assessment endpoints evaluated in the BERA were specified to protect mammalian, avian, benthic macroinvertebrate, and fish receptors in order to ensure a viable ecological community in the LVR. Risks to mammalian and avian receptors were evaluated using food chain models (FCMs) and biotic and abiotic data obtained from the LVR. Risks to benthic invertebrates were evaluated using toxicity testing and results of a community assessment. Risks to aquatic (fish) receptors were also evaluated using results of a community assessment. When possible, data regarding benthic invertebrates and fish on site were compared to data from an upstream reference reach not affected by site activities.

In accordance with EPA guidance, the BERA combined each line of evidence (measurement endpoint results) through a process of weighing the evidence to characterize the overall status of the ecological community in the LVR. Based on the weight of evidence, the BERA supports the following conclusions:

- No unacceptable risks were identified for mammalian receptors (mink);
- For avian receptors (kingfisher), an HQ of 1.8 for zinc was the only instance of a constituent HQ above 1;
- According to toxicity testing results combined with the more site-specific biological community assessment and resulting macroinvertebrate index of biotic

integrity and Macroinvertebrate Biotic Index metrics, the benthic macroinvertebrate community is functioning and viable; and

- According to the biological community assessment and resulting fish index of biotic integrity metrics, the aquatic (fish) community is functioning and viable.

Given the conservative assumptions in the FCMs and the lack of toxicity predicted for individual mammalian receptors, it is unlikely that the Site is adversely affecting populations of upper-trophic-level receptors that feed/forage along the LVR adjacent to the Site.

Together, these lines of evidence support a conclusion that the Site is not significantly adversely affecting the overall health of the ecological community of the LVR. As indicated above, some measurement endpoints suggest the possibility of limited impacts on the benthic community, but those effects, if any, are not consistently observed (e.g., no effects in the chronic toxicity tests and no acute effects at some sampled reaches along the Site) and are difficult to attribute to contaminants at the Site.

OU2

The following four major habitat areas were identified at OU2, as depicted on Figure 7:

- Main Industrial Area (called “Main Plant Area” on Figure 7) – highly disturbed (little or no vegetation); includes large portions of the Main Industrial Area
- Adjacent to the Main Plant – disturbed with vegetation (woodland/grassland); includes Building 100 Area, Rolling Mill Area, portions of the Main Industrial Area, and North Area
- Savannah – includes portions of North Area and Wooded Area - Northeast
- Oak-Hickory Woodland – includes Wooded Area - Northeast

Both a SLERA and a BERA were completed for the upland portion of OU2, consistent with EPA ecological risk assessment guidance. During the SLERA, maximum analyte concentrations in soil samples from each habitat area were compared to appropriate ESVs, and risks were identified within each habitat. These risks were associated with metals, pesticides, PCBs, and PAHs. Based on this information, a BERA was recommended for three of the four habitat areas: (1) Adjacent to the Main Plant – disturbed with vegetation (woodland/grassland), (2) Savannah, and (3) Oak-Hickory Woodland. Because of the poor quality of the habitat and the high levels of contamination in the Main Industrial Area, no BERA was conducted for this area.

The BERA used as many site-specific assumptions as possible so that the assessment would reflect site conditions. The BERA took into account site-specific chemical analytical data, site-specific bioaccumulation information, FCMs, and available scientific literature. The BERA evaluated potential exposures to plants, soil invertebrates, and mammalian and avian receptors (e.g., herbivores, invertivores, omnivores, and carnivores) within the three habitats. Site-specific information was obtained regarding bioaccumulations of metals in above-ground and below-ground portions of vegetation,

and bioaccumulations of metals in earthworms within site soils. In addition, soil toxicity was evaluated by collecting soil samples within each habitat and subjecting the soils to a seed germination and root-and-shoot elongation test. The soil exposure point concentrations (EPCs) were calculated for each habitat (the lower of the 95% upper confidence limit on the mean or the maximum concentration), and these data were used to assess risks to the various potential receptors. For plants and soil invertebrates, the EPCs were compared to plant- and soil-invertebrate-specific screening values to assess risks. In addition, soil toxicity and bioaccumulation test results were evaluated as part of a weight-of-evidence evaluation. An FCM was used to assess risks to mammalian and avian receptors.

Results of the BERA indicated the following risks within the three areas evaluated:

- Adjacent to the Main Plant – plants, soil invertebrates, and mammalian and avian receptors were all found to be at risk due to metals contamination. The most common metals were antimony, lead, mercury, selenium, and zinc;
- Savannah – plants, soil invertebrates, and mammalian and avian receptors were all found to be at risk due to metals contamination. The most common metals were lead and zinc; and
- Oak-Hickory Woodland – plants, soil invertebrates, and mammalian (only invertivores) and avian receptors were found to be at risk due to metals contamination. The most common metals were chromium, selenium, and zinc.

Because the Adjacent to the Main Plant area and the Savannah are viewed as likely industrial properties for future land use, ecological risks were not used in formulating PRGs. The Oak-Hickory Woodland in the northeast portion of OU2 was more closely evaluated for remediation using ecological restoration as a goal.

The Oak-Hickory Woodland habitat includes a steep slope from the OU2 area down to the LVR, and the woodlands visually appeared insignificantly impacted (established woodlands and supporting understory habitat were observed). A number of uncertainties associated with the risks within the Oak-Hickory Woodlands likely led to an overestimation of risk to this habitat. In summary, these uncertainties are related to the following factors:

- Risks to plants and invertebrates were calculated based on No Observed Adverse Effect Levels (NOAELs) rather than Lowest Observed Adverse Effect Levels (LOAELs), but the plant community present at the Site, as well as bioassay results, imply that the impacts have not been as great on this habitat as would be expected based on the numbers alone.
- FCM results based on LOAELs and maximum concentrations indicated potential impacts. However, the most significant exposure pathway is soil ingestion, and the FCM does not consider bioavailabilities of metals in the soils. Low bioavailabilities of metals are expected because of the pyroclastic composition of the material at the Site.

The Oak-Hickory Woodland habitat adjacent to the LVR appears to be stable and viable, and the community apparently is not significantly impacted by elevated metal concentrations in the soils. The most likely remedial action for this area of the Site would be removal of the upper layer of soils. This could be accomplished only by removing a significant amount of vegetation in the process, in turn significantly destabilizing the soil, increasing potential for erosion, and posing a long-term threat to the LVR from surface water runoff. Based on this weight of evidence, EPA concluded that the Wooded Area - Northeast would not benefit from remedial action, and the habitat should be allowed to continue its recovery. This conclusion is outlined in a Technical Memorandum dated October 10, 2013, which is included in the AR.

2.7 Remedial Action Objectives

RAOs are goals for protecting human health and the environment. Risk can be associated with current or potential future exposures. RAOs were developed for the Site based on the contaminant levels and exposure pathways that present current and/or future unacceptable risk to human health and the environment. Although each OU at the Site was subdivided into separate EAs during the risk assessment, the RAOs below were developed for each OU based on the media and areas that presented risks that need to be addressed; the RAOs are not necessarily broken down by the various EAs evaluated in the risk assessment.

Site-Specific RAOs

The following RAOs were developed to address the risks identified at the Site.

OU1

- Minimize or reduce the potential for ingestion, direct contact with, and inhalation of site COCs in impacted soils/solid matrices at the Carus Plant Area that could result in unacceptable human health risk to current or future commercial or industrial workers as determined in the HHRA.
- Minimize or reduce the potential for ingestion, direct contact with, and inhalation of site COCs in impacted soils/solid matrices at the Slag Pile Area that could result in unacceptable human health risk to current or future commercial/industrial workers, current or future utility workers, or future construction workers as determined in the HHRA.
- Reduce surface water runoff and erosion of material from the Slag Pile slope to prevent any unacceptable risks to any current or future human or ecological receptors and to protect the remedy being implemented.

OU2

- Site Property Soils (Main Industrial Area, North Area, Wooded Area - Northeast, Building 100 Area, Rolling Mill Area): Minimize or reduce the potential for exposure to metals, PCBs, TCE and asbestos through ingestion of, inhalation of,

or direct contact with soil that could result in unacceptable risks for current and future commercial/industrial workers, current and future utility workers, or future construction workers as determined in the HHRA.

- Off-Site Residential Area: Prevent direct contact with, or ingestion or inhalation of, COCs in affected soils at residential properties by current residential or potential future residential receptors that could result in an unacceptable human health risk as determined in the HHRA.

There are no RAOs for groundwater because EPA believes that groundwater does not warrant response action under CERCLA. As discussed earlier, Illinois EPA has classified the groundwater at the Site as Class II - General Resource (i.e., non-potable) groundwater. There are no groundwater supply wells at the Site and groundwater is not used for potable or industrial uses, including irrigation, and the groundwater is not appropriate for use as a potable source in the future. Further, an ordinance of the City of LaSalle, in conjunction with an MOU between the City and Illinois EPA, legally prohibits the drilling of water wells throughout the City of LaSalle for the purpose of obtaining a water supply, so ICs prohibiting the use of groundwater as a water supply are already in place. Although there are exceedances of the State's Class II standards, those standards are not health-based standards and, therefore, do not pose an unacceptable risk to human health or the environment.

2.8 Description of the Alternatives

In order to address the RAOs described above, a variety of remedial alternatives were developed for each EA of the Site that posed unacceptable risk. The remedial alternatives listed and briefly described below are those that were carried through the FS for detailed evaluation. The costs provided below are estimated present worth costs. With the exception of the Off-Site Residential Area (the PRG for which was discussed earlier), the costs for the various remedial alternatives were calculated assuming the acceptable risk level of 1E-05. The Proposed Plan had mistakenly indicated that the cleanup of some areas would use cleanup values based upon a risk level of 1E-06, but the PRGs that were presented in the Proposed Plan were all correctly based upon a risk level of 1E-05. This discrepancy is clarified in this ROD, and all costs and selected remedies now are based upon a risk level of 1E-05 (except the Off-Site Residential Area).

A more detailed description of each alternative that was carried through the FS is provided in Appendix 2, and additional details about each alternative are contained in the FS Report and other documents in the AR. All cost estimates assumed a 7% discount rate.

For each alternative below that includes on-site consolidation of excavated soils, there is a possibility that some of the excavated soils will be identified as characteristically hazardous due to toxicity. This is because some of the soil samples collected during the RI – specifically samples from the OU1 Slag Pile Area and the OU2 Main Industrial Area – exceeded the maximum concentration related to toxicity characteristic regulatory levels, based on TCLP results. The remedial alternatives that include on-site

consolidation of excavated soils assume that any characteristically hazardous soils can be effectively treated, via chemical stabilization, to render them non-hazardous so they can be contained on site instead of being transported off site for disposal. This issue will be further evaluated during the remedial design.

For each alternative below, excluding the No Action alternative, it is assumed that some type of IC will be needed for each area. The objectives for the ICs would be to prevent exposure to and disturbance of wastes and contaminated soils, interference with the remedy, and usage of groundwater at the Site. These objectives would be accomplished by various ICs such as environmental covenants and/or deed restrictions, along with property access restrictions. The type and placement of each IC will be determined during the remedial design phase of the project.

OUI

Carus Plant Area

- ALTERNATIVE 1 - NO ACTION
No action will be taken to mitigate risk. No cost is associated with this alternative.
 - *Estimated Capital Cost: \$0*
 - *Estimated Annual Operation and Maintenance (O&M) Cost: \$0*
 - *Estimated Present Worth Cost: \$0*
 - *Estimated Construction Timeframe: None*

- ALTERNATIVE 4 - EXCAVATION (WITH OFF-SITE DISPOSAL)
Excavate areas of the Carus Plant Area with soil concentrations above acceptable commercial/industrial human health risk levels. Transport wastes off site for disposal. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost: \$5,621,150*
 - *Estimated Annual O&M Cost \$10,000*
 - *Estimated Present Worth Cost: \$5,950,000*
 - *Estimated Construction Timeframe. 3-4 months*

- ALTERNATIVE 5 - LOW PERMEABILITY COVER
Install an engineered low-permeability cover to isolate impacted soil at the Carus Plant Area from commercial/industrial, utility, and construction workers. The cover may consist of a synthetic material, clay, or paving; asphalt paving is a likely option as the majority of the plant area is currently paved. Remove a small quantity of accumulated soil and vegetation from a gravel-paved storage area and consolidate the materials in the on-site slag pile prior to installation of the low-permeability cover over the gravel area. Implement land use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.
 - *Estimated Capital Cost: \$1,184,300*
 - *Estimated Annual O&M Cost \$10,000*

- *Estimated Present Worth Cost: \$1,530,000*
 - *Estimated Construction Timeframe 1 month*
- ALTERNATIVE 6 - SOIL COVER
Install an engineered soil cover to isolate impacted soil at the Carus Plant Area from commercial/industrial, utility, and construction workers. Remove a small quantity of accumulated soil and vegetation from a gravel-paved storage area and consolidate the materials in the on-site slag pile prior to installation of asphalt over the gravel area. Implement land use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.
 - *Estimated Capital Cost: \$1,274,300*
 - *Estimated Annual O&M Cost: \$14,000*
 - *Estimated Present Worth Cost: \$1,620,000*
 - *Estimated Construction Timeframe 1 month*

Slag Pile Area (including Slope Stability)

- ALTERNATIVE 1 - NO ACTION
No action will be taken to mitigate risk. No cost is associated with this alternative.
 - *Estimated Capital Cost: \$0*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$0*
 - *Estimated Construction Timeframe. None*
- ALTERNATIVE 4 - EXCAVATION (WITH OFF-SITE DISPOSAL)
Excavate areas at the Slag Pile Area with soil concentrations above acceptable commercial/industrial human health risk levels (this assumes that all slag would be removed). Transport excavated materials off site for disposal. Backfill the excavated areas. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost: \$213,576,000*
 - *Estimated Annual O&M Cost: \$16,000*
 - *Estimated Present Worth Cost: \$214,069,000*
 - *Estimated Construction Timeframe: 22 months*
- ALTERNATIVE 5 - LOW PERMEABILITY COVER
Install an engineered low-permeability cover to isolate impacted soil at the Slag Pile Area from commercial/industrial, utility, and construction workers. The cover may consist of a synthetic material or clay. Implement land use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.
 - *Estimated Capital Cost: \$6,756,000*
 - *Estimated Annual O&M Cost: \$16,000*

- *Estimated Present Worth Cost \$7,309,000*
 - *Estimated Construction Timeframe: 9 months*
- **ALTERNATIVE 6 - SOIL COVER**
 Install an engineered soil cover to isolate impacted soil at the Slag Pile Area from commercial/industrial, utility, and construction workers. Implement land use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.
 - *Estimated Capital Cost: \$6,534,000*
 - *Estimated Annual O&M Cost: \$16,000*
 - *Estimated Present Worth Cost: \$7,087,000*
 - *Estimated Construction Timeframe: 9 months*
 - **ALTERNATIVE 12 - EXCAVATION (WITH ON-SITE CONSOLIDATION ON OU2)**
 This alternative is the same as Alternative 4 except that the excavated materials from the Slag Pile Area would be taken to OU2 for consolidation in an on-site consolidation area instead of being transported off site for disposal. Any characteristically hazardous wastes (i.e., soils that fail TCLP) would be consolidated and treated in-situ to render the wastes non-hazardous before being covered with a soil cover in the consolidation area.
 - *Estimated Capital Cost: \$101,083,000*
 - *Estimated Annual O&M Cost: \$16,000*
 - *Estimated Present Worth Cost: \$101,636,000*
 - *Estimated Construction Timeframe: 22 months*

The following two alternatives would physically stabilize the slope of the slag pile and would reduce surface runoff and slope erosion. These alternatives may be implemented in conjunction with Alternatives 5 or 6 above

- **ALTERNATIVE 14 - SLOPING AND BENCHING + REVETMENTS⁴ AT THE TOE OF THE SLOPE + BEST MANAGEMENT PRACTICES (BMPS)**
 Remove existing vegetation from the slag pile. Excavate, slope, and bench the slag pile along the LVR, and install a 2-foot-thick engineered soil cover. Install revetments at the toe of the slope for erosion protection along the river. Implement BMPs, including seeding for the soil cover. Implement additional BMPs such as straw wattles, graded benches with check dams and rip-rapped down-chutes, and top of slope surface runoff control berms and graded surface swales.
 - *Estimated Capital Cost: \$17,479,000*
 - *Estimated Annual O&M Cost: \$14,000*
 - *Estimated Present Worth Cost \$17,986,000*
 - *Estimated Construction Timeframe: 10 months*

⁴ A revetment is a facing to sustain an embankment.

- ALTERNATIVE 15 - SLOPING AND BENCHING + PLANTINGS + REVETMENTS AT THE TOE OF THE SLOPE + BMPS

This alternative is the same as Alternative 14 except for the addition of high-density tree planting to further stabilize the slope of the slag pile.

- *Estimated Capital Cost: \$17,617,000*
- *Estimated Annual O&M Cost: \$14,000*
- *Estimated Present Worth Cost: \$18,124,000*
- *Estimated Construction Timeframe: 10 months*

OU2

Main Industrial Area

- ALTERNATIVE 1 - NO ACTION

No action will be taken to mitigate risk. No cost is associated with this alternative.

- *Estimated Capital Cost: \$0*
- *Estimated Annual O&M Cost: \$0*
- *Estimated Present Worth Cost: \$0*
- *Estimated Construction Timeframe: None*

- ALTERNATIVE 2 - SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER

Excavate areas at the Main Industrial Area with soil concentrations above acceptable commercial/industrial human health risk levels. Consolidate excavated materials in an on-site consolidation area at the Main Industrial Area. Any characteristically hazardous wastes (i.e., soils that fail TCLP) would be consolidated and treated in-situ to render the wastes non-hazardous before being covered with a soil cover in the consolidation area. Implement land use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.

- *Estimated Capital Cost \$34,400,000*
- *Estimated Annual O&M Cost. \$34,560 [Years 1-5]; \$24,100 [Years 6-30]*
- *Estimated Present Worth Cost: \$34,800,000*
- *Estimated Construction Timeframe. 26 months*

- ALTERNATIVE 3 - EX-SITU CHEMICAL STABILIZATION

Excavate areas at the Main Industrial Area with soil concentrations above acceptable commercial/industrial human health risk levels. Use chemical stabilization to treat the excavated materials at an on-site treatment location within the Main Industrial Area. This would reduce the mobility and bioavailability of the COCs and decrease risks to acceptable levels. Use the treated, stabilized soil as backfill material at the original excavation location. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.

- *Estimated Capital Cost \$72,000,500*
 - *Estimated Annual O&M Cost. \$60,000 first year; none after first year*
 - *Estimated Present Worth Cost: \$72,586,000*
 - *Estimated Construction Timeframe. 33 months*
- **ALTERNATIVE 4 - SOIL EXCAVATION + EX-SITU TREATMENT BY SOIL WASHING**
Excavate areas at the Main Industrial Area with soil concentrations above acceptable commercial/industrial human health risk levels. Use soil washing to treat the excavated materials at an on-site soil-washing treatment location within the Main Industrial Area, to reduce concentrations of COCs to acceptable levels. Use the treated soil as backfill material at the original excavation location. Transport and dispose of washing wastewater and dewatered sludge at an off-site facility. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost \$181,948,500*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$182,001,000*
 - *Estimated Construction Timeframe: 70 months*
- **ALTERNATIVE 5 - SOIL EXCAVATION + OFF-SITE DISPOSAL**
Excavate areas at the Main Industrial Area with soil concentrations above acceptable commercial/industrial human health risk levels. Transport the excavated materials off site for disposal. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost. \$124,489,500*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$124,542,000*
 - *Estimated Construction Timeframe: 42 months*

North Area⁵

- **ALTERNATIVE 1 - NO ACTION**
No action will be taken to mitigate risk. No cost is associated with this alternative.
 - *Estimated Capital Cost: \$0*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$0*
 - *Estimated Construction Timeframe: None*

⁵ It should be noted that the cost estimates for the North Area were developed during the FS and were based on the reasonably anticipated land use being residential. It was later determined that future residential use of the North Area is unlikely, and that the current reasonably anticipated land use is commercial/industrial, consistent with current zoning. Because the cost estimates are based on residential land use and not commercial/industrial land use, they likely overestimate the costs. The cost of the selected alternative for the North Area will be refined during the remedial design phase and will reflect the degree of cleanup necessary for commercial/industrial land use.

- **ALTERNATIVE 2 - ICS ONLY**
 Implement land use restrictions to ensure the land use remains commercial/industrial. Require any excavation be done with knowledge of residual contamination such that proper precautions are taken to protect commercial/industrial, utility, and construction workers from exposure to COCs.

 - *Estimated Capital Cost: \$144,000*
 - *Estimated Annual O&M Cost: \$6,970*
 - *Estimated Present Worth Cost: \$283,000*
 - *Estimated Construction Timeframe: 1 month (no construction)*

- **ALTERNATIVE 3 - PHYTOREMEDIATION**
 Treat soil contaminants at the North Area through phytoremediation. Install appropriate plants that specialize in uptake of the various COCs. Harvest plants up to two times per season (including at the end of each growing season) and transport off site for disposal. Implement land use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.

 - *Estimated Capital Cost: \$12,013,000*
 - *Estimated Annual O&M Cost: \$19,320 [Years 1-5]; \$13,270 [Years 6-30]*
 - *Estimated Present Worth Cost: \$12,152,000*
 - *Estimated Construction Timeframe: 1 month*

- **ALTERNATIVE 4 - SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER**
 Excavate areas at the North Area with soil concentrations above acceptable commercial/industrial human health risk levels. Consolidate excavated materials in an on-site consolidation area at the Main Industrial Area. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.

 - *Estimated Capital Cost: \$14,900,000*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$14,900,000*
 - *Estimated Construction Timeframe: 7 months*

- **ALTERNATIVE 5 - SOIL EXCAVATION + OFF-SITE DISPOSAL**
 This alternative is the same as Alternative 4 above except that the excavated materials from the North Area would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.

 - *Estimated Capital Cost: \$34,800,000*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$34,800,000*
 - *Estimated Construction Timeframe: 7 months*

Building 100 Area

- ALTERNATIVE 1 - NO ACTION
No action will be taken to mitigate risk. No cost is associated with this alternative.
 - *Estimated Capital Cost: \$0*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$0*
 - *Estimated Construction Timeframe: None*

- ALTERNATIVE 2 - ICS ONLY
Implement land use restrictions to ensure the land use remains commercial/ industrial. Require any excavation be done with knowledge of residual contamination such that proper precautions are taken to protect commercial/ industrial, utility, and construction workers from exposure to COCs.
 - *Estimated Capital Cost: \$292,000*
 - *Estimated Annual O&M Cost: \$30,930*
 - *Estimated Present Worth Cost: \$431,000*
 - *Estimated Construction Timeframe: 1 month (no construction)*

- ALTERNATIVE 3 - SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
Excavate areas at the Building 100 Area with soil concentrations above acceptable commercial/industrial human health risk levels. Consolidate excavated materials in an on-site consolidation area at the Main Industrial Area. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost: \$3,200,000*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$3,200,000*
 - *Estimated Construction Timeframe: 4 months*

- ALTERNATIVE 4 - SOIL EXCAVATION + OFF-SITE DISPOSAL
This alternative is the same as Alternative 3 above except that the excavated materials from the Building 100 Area would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.
 - *Estimated Capital Cost: \$9,200,000*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$9,200,000*
 - *Estimated Construction Timeframe: 5 months*

Rolling Mill Area

- ALTERNATIVE 1 - NO ACTION
No action will be taken to mitigate risk. No cost is associated with this alternative.
 - *Estimated Capital Cost: \$0*
 - *Estimated Annual O&M Cost: \$0*

- *Estimated Present Worth Cost: \$0*
- *Estimated Construction Timeframe: None*

- **ALTERNATIVE 2 - ICS ONLY**
 Implement land use restrictions to ensure the land use remains commercial/industrial. Require any excavation be done with knowledge of residual contamination such that proper precautions are taken to protect commercial/industrial, utility, and construction workers from exposure to COCs.
 - *Estimated Capital Cost: \$330,000*
 - *Estimated Annual O&M Cost: \$6,970*
 - *Estimated Present Worth Cost: \$469,000*
 - *Estimated Construction Timeframe: 1 month (no construction)*

- **ALTERNATIVE 3 - SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER**
 Excavate areas at the Rolling Mill Area with soil concentrations above acceptable commercial/industrial human health risk levels. Consolidate excavated materials in an on-site consolidation area at the Main Industrial Area. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost: \$3,600,000*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$3,600,000*
 - *Estimated Construction Timeframe: 3 months*

- **ALTERNATIVE 4 - SOIL EXCAVATION + EX-SITU TREATMENT BY SOIL WASHING**
 Excavate areas at the Rolling Mill Area with soil concentrations above acceptable commercial/industrial human health risk levels. Use soil washing to treat the excavated materials at an on-site soil-washing treatment location within the Main Industrial Area to reduce concentrations of COCs to acceptable levels. Use the treated soil as backfill material at the original excavation location. Transport and dispose of washing wastewater and dewatered sludge at an off-site facility. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.
 - *Estimated Capital Cost: \$10,074,800*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$10,127,000*
 - *Estimated Construction Timeframe: 4 months*

- **ALTERNATIVE 5 - SOIL EXCAVATION + OFF-SITE DISPOSAL**
 Excavate areas at the Rolling Mill Area with soil concentrations above acceptable commercial/industrial human health risk levels. Transport the excavated materials off site for disposal. Implement land use restrictions and property access restrictions to ensure the land use remains commercial/industrial.

- *Estimated Capital Cost: \$7,300,000*
- *Estimated Annual O&M Cost: \$0*
- *Estimated Present Worth Cost: \$7,300,000*
- *Estimated Construction Timeframe: 3 months*

Off-Site Residential Area

During the RI, approximately 200 properties in the Off-Site Residential Area were tested. In order to estimate the number of properties that are likely to require cleanup, the Off-Site Residential Area was divided into four zones, based on the density of properties sampled during the RI and distance from the on-site areas of OU2. Based on an extrapolation of the RI sampling results (and using the residential lead PRG of 400 mg/kg), EPA estimates that approximately 2,800 properties will require cleanup. The actual number of properties that require cleanup will be determined by extensive sampling of the Off-Site Residential Area during the remedial design phase. Additionally, as noted in Section 1.4 of this ROD, EPA will re-evaluate the lead cleanup numbers during the remedial design phase. Any resulting changes to the residential lead cleanup number may impact the number of properties that require cleanup.

Due to the large number of properties that are likely to require cleanup, and the length of time for all the properties to be addressed, EPA will likely use a phased approach for the residential cleanup activities. Properties might be prioritized in order to address properties with higher concentrations of COCs first, where sensitive receptors are present, and/or where children with elevated blood lead levels are present. These decisions will be made during the remedial design phase.

- **ALTERNATIVE 1 - NO ACTION**
No action will be taken to mitigate risk. No cost is associated with this alternative.
 - *Estimated Capital Cost: \$0*
 - *Estimated Annual O&M Cost: \$0*
 - *Estimated Present Worth Cost: \$0*
 - *Estimated Construction Timeframe: None*

- **ALTERNATIVE 2 - ON-SITE SOIL COVER**
Cover contaminated soil at impacted properties in the Off-Site Residential Area with a 1-foot-thick soil cover. Implement land use restrictions at impacted properties to exclude gardens (except for raised-bed gardens using imported clean soil) and to protect the constructed remedy components.
 - *Estimated Capital Cost \$104,894,000*
 - *Estimated Annual O&M Cost: \$1,678,800 [Years 1-5]; \$1,018,000 [Years 6-30]*
 - *Estimated Present Worth Cost \$127,590,000*
 - *Estimated Construction Timeframe: 148 months*

- **ALTERNATIVE 3 - SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER**

Excavate contaminated soil at impacted properties in the Off-Site Residential Area to a maximum depth of 24 inches. Consolidate excavated materials in an on-site consolidation area at the Main Industrial Area. If contamination remains in place deeper than 24 inches, install a visual barrier on top of the underlying contamination prior to backfilling with clean soil, and implement land use restrictions as appropriate.

- *Estimated Capital Cost: \$112,147,700*
- *Estimated Annual O&M Cost: \$0*
- *Estimated Present Worth Cost: \$112,925,000*
- *Estimated Construction Timeframe: 177 months*

- **ALTERNATIVE 4 - SOIL EXCAVATION + OFF-SITE DISPOSAL**

This alternative is the same as Alternative 3 above except that the excavated materials from the Off-Site Residential Area would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.

- *Estimated Capital Cost: \$156,248,000*
- *Estimated Annual O&M Cost: \$0*
- *Estimated Present Worth Cost: \$157,025,000*
- *Estimated Construction Timeframe: 176 months*

2.9 Common Elements

Section 121(d) of CERCLA requires that Superfund remedial actions meet ARARs. A complete listing of ARARs can be found in Table 3.

There are three categories of ARARs that are evaluated during the FS process at Superfund sites: location-specific, action-specific, and chemical-specific ARARs. Location-specific ARARs establish restrictions on activities such as the management of waste or hazardous substances in specific locations (such as the capped consolidation area), discharges of waste effluent from former mine areas, and protection of endangered species in sensitive habitats. Action-specific ARARs are technology-based or activity-based requirements or limitations on actions taken with respect to remediation, and are triggered by particular remedial activities that are selected to accomplish the remedial objectives. Chemical-specific ARARs are health- or risk-based numerical values or methodologies that establish concentration or discharge limits, or a basis for calculating such limits, for particular substances, pollutants or contaminants.

When evaluating federal and state requirements to determine whether they are ARARs, EPA evaluates whether they are *applicable* to the site or *relevant and appropriate* to the circumstances at the site. Additionally, EPA may consider other requirements, known as “*to-be-considered*” requirements (TBCs), for use at a site. Table 3 describes how EPA views each particular ARAR that was identified for this Site.

Soils and other wastes at the Site contaminated with PCBs will be cleaned up in accordance with the Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2601-2629, and EPA's regulations implementing TSCA which are set forth at 40 C.F.R. Part 761. Soils and other wastes contaminated with asbestos will be cleaned up in accordance with the State of Illinois' asbestos regulations set forth at 35 IAC Part 228.

Any soils excavated at the Site that are characterized as hazardous waste as that term is defined under the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992k, will be addressed with in-situ treatment under EPA's Area of Contamination Policy. This policy allows for the consolidation of contiguous contamination into one area, which can then be treated in-situ, capped in place, or processed within this area to improve its structural stability. The specific in-situ treatment method will be evaluated during the remedial design, but is assumed to be chemical stabilization. If the remedial design evaluation shows that the excavated characteristically hazardous wastes cannot be effectively treated in-situ, then those wastes would be transported off site for disposal in accordance with the Off-Site Rule, 40 C.F.R. § 300.440.

Any potential effluent generated in OU1 will be monitored as specified under the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES), 33 U.S.C. §1251-1387, CWA NPDES Permit Program (40 CFR Part 122), which establishes effluent standards for contaminants in navigable waters of the United States, regulates quality standards for surface waters, and establishes a permit program to regulate a discharge into the navigable waters of the United States, including wetlands.

Long-term ICs at the Site will comply with 765 ILCS 122: Illinois' Uniform Environmental Covenants Act, which establishes requirements for implementing activity and use limitations at sites within Illinois, including NPL sites.

Since the Site did formerly have mines located on OU2, the requirements of 20 ILCS 1920: Abandoned Mined Lands and Water Reclamation Act will apply for the potential reclamation of abandoned mined lands in order to restore lands and waters to productive use.

2.10 Comparative Analysis of Alternatives

Section 121(b)(1) of CERCLA presents several factors that EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives. The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with federal and state ARARs (threshold criteria), consider technical or economic merits (primary balancing criteria), or involve the evaluation of non-EPA reviewers that may influence an EPA decision (modifying criteria).

Explanation of the Nine Evaluation Criteria

Threshold Criteria

1. **Overall protection of human health and the environment:** Alternatives are evaluated to determine whether they can protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants, or contaminants by eliminating, reducing, or controlling exposures.
2. **Compliance with ARARs:** Alternatives are evaluated to determine whether they attain requirements under federal, tribal, and state environmental laws and regulations, or provide grounds for invoking a waiver. This evaluation includes a review of whether alternatives can meet chemical-specific, action-specific, and location-specific ARARs.

Primary Balancing Criteria

3. **Long-term effectiveness and permanence:** Alternatives are evaluated for the degree of long-term effectiveness and permanence they provide and for the degree of certainty that the alternative will prove to be successful.
4. **Reduction of toxicity, mobility, or volume through treatment:** Alternatives are evaluated to determine the degree to which they employ treatment to reduce the toxicity, mobility, or volume of the site contaminants.
5. **Short-term effectiveness:** Short-term impacts on the community and workers during implementation of alternatives are evaluated. Such impacts include transportation (including noise, dust, and traffic hazards), protection of workers, and the timeframe for implementing the remedy. This criterion also considers the effectiveness of mitigative measures until protection is achieved through attainment of the RAOs.
6. **Implementability:** The ease of implementing alternatives is evaluated, considering technical difficulties and reliability of various technologies, coordination with other offices and agencies, and availability of services and materials.
7. **Cost:** Capital costs and ongoing, long-term costs are evaluated. The estimated costs for each alternative have an expected accuracy of +50% to -30%.

Modifying Criteria

8. **State Acceptance:** The State's position and key concerns on the remedial alternatives are considered, as well as comments on ARARs or proposed use of waivers.
9. **Community Acceptance:** The community's support of, reservations about, or opposition to the remedial alternatives are considered.

Comparison of Alternatives

The FS Report contains a detailed discussion of the comparative analysis of alternatives, where the various alternatives for each area of the Site are compared against each other in terms of how they fare against the nine evaluation criteria. Table 4 provides an overall summary of the comparative analysis, and Table 5 provides a more detailed description of the comparative analysis, including the rankings and scoring of each alternative. Note that the “Cost” information in Table 5 often provides three costs for each alternative; these represent the estimated costs for cleanup to the 1E-04, 1E-05, and 1E-06 risk levels, as PRGs had not yet been selected when this information was developed.

A narrative summary of the comparative analysis of alternatives is provided below.

Overall Protection of Human Health and the Environment

For each separate area of the Site, all of the retained alternatives – with the exception of each area’s “no action” alternative – would protect human health and the environment. Because the “no action” alternative (Alternative 1 in each instance) would not protect human health and the environment, Alternative 1 was eliminated from consideration and will not be discussed under the remaining eight criteria. For all of the remaining alternatives, RAOs would be achieved immediately upon completion of the construction work. The discussion below summarizes how the remaining alternatives for each area would achieve protectiveness.

OUI

- ***Carus Plant Area:*** Alternative 4 would meet the RAOs by excavating and transporting off site for disposal all wastes posing unacceptable risks. Alternatives 5 and 6 would meet the RAOs by covering with a low-permeability cover and a soil cover, respectively, those areas of the plant that pose an unacceptable risk. Alternatives 4, 5, and 6 all would include the use of ICs and property access restrictions to limit this area of the Site to commercial/industrial land use.
- ***Slag Pile Area (including Slope Stability):*** Alternative 4 would meet the RAOs by excavating and transporting off site for disposal all wastes posing unacceptable risks. Alternatives 5 and 6 would meet the RAOs by covering with a low-permeability cover and a soil cover, respectively, slag pile soils that pose an unacceptable risk. Alternative 12 would meet the RAOs by excavating and consolidating within an on-site, consolidation area all wastes posing unacceptable risks, and treating any characteristically hazardous wastes in-situ via chemical stabilization. Slope stability Alternatives 14 and 15 would meet the RAOs by reducing surface runoff and erosion from the slag pile. Alternatives 4, 5, and 6 would include the use of ICs and property access restrictions to limit this area of the Site to commercial/industrial land use.

OU2

- **Main Industrial Area:** Alternative 2 would meet the RAOs by excavating and consolidating within an on-site, consolidation area all wastes posing unacceptable risks, and treating any characteristically hazardous wastes in-situ via chemical stabilization. Alternative 3 would meet the RAOs by excavating contaminated soils, mixing them with a chemical stabilizer, and returning the stabilized soils to their original location. Alternative 4 would meet the RAOs by using soil-washing to treat excavated soils and returning the treated soils to their original location. Alternative 5 would meet the RAOs by excavating and transporting off site for disposal all wastes posing unacceptable risks. Alternatives 2, 3, 4, and 5 all would include the use of ICs and property access restrictions to limit this area of the Site to commercial/industrial land use.
- **North Area:** Alternative 2 would meet the RAOs by limiting potential exposures to the contamination through the use of ICs. Alternative 3 would use phytoremediation to meet the RAOs. Alternatives 4 and 5 would meet the RAOs by excavating all wastes posing unacceptable risks and either consolidating them in an on-site consolidation area or transporting them off site for disposal, respectively.
- **Building 100 Area:** Alternative 2 would meet the RAOs by limiting potential exposures to the contamination through the use of ICs. Alternatives 3 and 4 would meet the RAOs by excavating all wastes posing unacceptable risks and either consolidating them in an on-site consolidation area or transporting them off site for disposal, respectively.
- **Rolling Mill Area:** Alternative 2 would meet the RAOs by limiting potential exposures to the contamination through the use of ICs. Alternatives 3 and 5 would meet the RAOs by excavating all wastes posing unacceptable risks and either consolidating them in an on-site consolidation area or transporting them off site for disposal, respectively. Alternative 4 would meet the RAOs by treating excavated soils using soil-washing technology before using the treated soils as backfill materials.
- **Off-Site Residential Area:** Alternative 2 would meet the RAOs by covering contaminated soils with a clean soil cover to minimize direct contact with the contamination, and by using ICs to ensure the soil cover at each property remains intact and undisturbed. Alternatives 3 and 4 would meet the RAOs by excavating all soils posing unacceptable risks and either consolidating them in an on-site consolidation area or transporting them off site for disposal, respectively.

Compliance with ARARs

For each separate area of the Site, all of the retained remedial action alternatives would comply with their respective ARARs from federal and state laws. Specific citations for ARARs can be found in Table 3, including a description of whether they are applicable,

relevant and appropriate, or to-be-considered requirements. The key ARARs that the Selected Remedy would need to address, and the TBCs that the Selected Remedy would consider, are listed below.

State ARARs and TBCs

- 35 IAC Part 228.141: Asbestos (ARAR)
- 35 IAC Part 807.305c and 807.502: Final Cover and Closure Standards (ARAR)
- 765 ILCS 122: Illinois Uniform Environmental Covenants Act (ARAR)
- 35 IAC Part 742: Tiered Approach to Corrective Action Objectives (TBC)

Federal ARARs and TBCs

- Resource Conservation and Recovery Act of 1976 (ARAR)
- Endangered Species Act (ARAR)
- Toxic Substances Control Act (ARAR)
- Clean Water Act of 1977 (TBC)
- Fish and Wildlife Conservation Act (TBC)

Long-Term Effectiveness and Permanence

OU1

- ***Carus Plant Area:*** Alternative 4 would provide the highest degree of long-term effectiveness and permanence through the excavation and off-site disposal of contaminated soil exceeding PRGs. Alternatives 5 and 6 would rely on continued maintenance of a cover over contaminated soils to ensure long-term effectiveness and permanence.
- ***Slag Pile Area (including Slope Stability):*** Alternatives 4 and 12 would provide the highest degree of long-term effectiveness and permanence through the excavation of all slag pile soils that pose a risk; Alternative 4 would transport the excavated soils off site for disposal, and Alternative 12 would manage them in an on-site consolidation area. Alternatives 5 and 6 would rely on continued maintenance of a cover over the slag pile to ensure long-term effectiveness and permanence. When used in conjunction with either Alternative 5 or Alternative 6, slope stability Alternative 15 would provide slightly better permanence and erosion control than Alternative 14 due to the addition of plantings along the slope.

OU2

- ***Main Industrial Area:*** Alternatives 2 and 5 would provide the highest degree of long-term effectiveness and permanence through the excavation of all soils that pose a risk; Alternative 5 would transport the excavated soils off site for disposal, and Alternative 2 would manage the excavated soils in an on-site consolidation area. The long-term effectiveness and permanence of Alternative 3 would depend on the

reliability of the chemical stabilizer used to treat the excavated soils, including the ability of the stabilizer to withstand weather conditions over the long term that may cause it to break down, reducing its effectiveness. Alternative 4 is considered less effective than Alternatives 2, 3, and 5 because ex-situ treatment by soil washing may be less effective on non-metal COCs, such as PCBs and PAHs, than on metals.

- **North Area:** Alternatives 4 and 5 would provide the highest degree of long-term effectiveness and permanence through the excavation of all soils that pose a risk; Alternative 5 would transport the excavated soils off site for disposal, and Alternative 4 would manage the excavated soils in an on-site consolidation area. The ability of Alternative 3 to provide long-term effectiveness and permanence depends on a number of factors, including identifying the correct variety of plants during remedial design that would uptake the range of COCs in the North Area. Phytoremediation would require multiple harvesting events and is limited to the root depth of the plants; Alternative 3 would, therefore, rely on ICs to leave deeper soils undisturbed. Alternative 2 is considered less effective than the other alternatives because it does not include remedial action components that contain or reduce COC concentrations in soil and ICs would be the only mechanism used to address risks.
- **Building 100 Area:** Alternatives 3 and 4 would provide the highest degree of long-term effectiveness and permanence through the excavation of all soils that pose a risk; Alternative 4 would transport the excavated soils off site for disposal, and Alternative 3 would manage the excavated soils in an on-site consolidation area. Alternative 2 is considered less effective than the other alternatives because it does not include remedial action components that contain or reduce COC concentrations in soil and ICs would be the only mechanism used to address risks.
- **Rolling Mill Area:** Alternatives 3 and 5 would provide the highest degree of long-term effectiveness and permanence through the excavation of all soils that pose a risk; Alternative 5 would transport the excavated soils off site for disposal, and Alternative 3 would manage the excavated soils in an on-site consolidation area. Alternative 4 is considered less effective than Alternatives 3 and 5 because ex-situ treatment by soil washing may be less effective on non-metal COCs, such as PCBs and PAHs, than on metals. Alternative 2 is considered less effective than the other alternatives because it does not include remedial action components that contain or reduce COC concentrations in soil and ICs would be the only mechanism used to address risks.
- **Off-Site Residential Area:** Alternatives 3 and 4 would provide the highest degree of long-term effectiveness and permanence through the excavation of all soils that pose a risk; Alternative 4 would transport the excavated soils off site for disposal, and Alternative 3 would manage the excavated soils in an on-site consolidation area. Alternative 2 is considered less effective than the other alternatives because ICs would be needed at numerous residential properties to ensure that the soil cover remains undisturbed and it would be difficult to monitor and enforce the ICs.

Reduction of Toxicity, Mobility, or Volume through Treatment

OU1

- **Carus Plant Area:** None of the Carus Plant Area alternatives include a treatment component to reduce the toxicity, mobility, or volume of the contaminated soils.
- **Slag Pile Area (including Slope Stability):** Alternative 12 is the only Slag Pile Area alternative that includes a treatment component. Alternative 12 would chemically stabilize COCs in excavated soils and slag materials and would reduce their mobility, but would not reduce their toxicity or volume.

OU2

- **Main Industrial Area:** Alternatives 2, 3 and 4 include the use of treatment technologies. Alternatives 2 and 3 would chemically stabilize COCs in soils and would reduce their mobility, but would not reduce their toxicity or volume. Alternative 4 would reduce the mass of COCs in soil with ex-situ soil-washing technology. By reducing the COC mass, the volume of the COCs in soil would also be reduced, making Alternative 4 rank the highest in this category. Alternative 5 does not include a treatment component.
- **North Area:** Alternative 3 is the only North Area alternative that includes a treatment component. Alternative 3 would reduce the mobility and volume of COCs by removing contaminants from soil and concentrating them in plants, which would then be harvested and sent off site for disposal. This alternative would not reduce the toxicity of the contaminants that would remain in the plants.
- **Building 100 Area:** None of the Building 100 Area alternatives include a treatment component to reduce the toxicity, mobility, or volume of the contaminated soils.
- **Rolling Mill Area:** Alternative 4 is the only Rolling Mill Area alternative that includes a treatment component. Alternative 4 would reduce the mass of COCs in soil with ex-situ soil-washing technology. By reducing the COC mass, the volume of the COCs in soil would also be reduced.
- **Off-Site Residential Area:** None of the Off-Site Residential Area alternatives include a treatment component to reduce the toxicity, mobility, or volume of the contaminated soils.

Short-Term Effectiveness

OU1

- **Carus Plant Area:** Alternative 4 would pose greater potential short-term impacts to the workers conducting the cleanup than Alternatives 5 and 6 because more

excavation of contaminated soils is associated with that alternative. Alternative 4 would also involve excavation near existing infrastructure and utilities, but such risks would be minimized through development and implementation of appropriate health and safety protocols. Appropriate dust control measures would be used during implementation of all three alternatives to control particulate emissions during excavation and/or cover installation.

- ***Slag Pile Area (Including Slope Stability):*** Alternatives 4, 5, 6, 12, 14, and 15 would all pose moderate to high risks to the workers conducting the cleanup work due to the steep and potentially unstable slopes associated with the slag pile. However, these risks would be minimized through development and implementation of appropriate health and safety protocols. Other potential short-term impacts common to all alternatives include particulate emissions during excavation and/or cover installation, but these risks would be controlled through appropriate dust control measures. Alternatives 4 and 12 would pose greater potential short-term impacts to the workers conducting the cleanup than the other alternatives because Alternatives 4 and 12 include excavation of the entire contaminated slag pile, but such risks would be minimized through development and implementation of appropriate health and safety protocols. Alternatives 4 and 12 also would take much longer to implement than Alternatives 5 and 6, so the timeframe to reach RAOs would be longer. Alternative 4 would pose greater short-term risks to the community than all the other alternatives because of the significant amount of truck traffic needed for off-site disposal of the entire slag pile.

OU2

- ***Main Industrial Area:*** Alternatives 2, 3, 4, and 5 would all pose potential short-term impacts to workers due to potential exposure to contaminated soil, since all of these alternatives involve the excavation of all soils exceeding PRGs. These risks would be minimized through development and implementation of appropriate health and safety protocols. Measures would be taken during implementation of all remedial alternatives to limit the risk of off-site migration of particulate emissions during remedial activities. Alternative 5 would pose greater short-term risks to the community than all of the other alternatives because of the significant amount of truck traffic required for off-site disposal of a significant volume of contaminated soils.
- ***North Area:*** Alternative 2 would pose no short-term impacts to workers or the community because no active remedial measures would be implemented. Alternative 3 would pose only minimal short-term impacts, since the main remedial activities would be planting, weeding, fertilizing, and harvesting the plants. Alternatives 4 and 5 would pose greater short-term impacts to the workers conducting the cleanup than the other alternatives because Alternatives 4 and 5 include excavation of all contaminated soils. These risks would be minimized through development and implementation of appropriate health and safety protocols. Alternative 5 would pose somewhat greater short-term impacts to the community than the other alternatives

because the excavated soils would be transported off site for disposal, requiring truck traffic through the community.

- **Building 100 Area:** Alternative 2 would pose no short-term impacts to workers or the community because no active remedial measures would be implemented. Alternative 3 would pose only minimal short-term impacts, since the amount of contaminated soils being excavated and handled is relatively small. Alternative 4 would pose somewhat greater short-term impacts to the community than the other alternatives because the excavated soils would be transported off site for disposal, requiring truck traffic through the community.
- **Rolling Mill Area:** Alternative 2 would pose no short-term impacts to workers or the community because no active remedial measures would be implemented. Alternatives 3 and 4 would pose only minimal short-term impacts, since the amount of contaminated soils being excavated and handled is relatively small. Alternative 5 would pose somewhat greater short-term impacts to the community than the other alternatives because the excavated soils would be transported off site for disposal, requiring truck traffic through the community.
- **Off-Site Residential Area:** Alternatives 2, 3, and 4 would all pose short-term impacts to the community and workers during implementation, as all three alternatives involve truck traffic through the community over a significant period of time. The short-term impacts associated with Alternative 2 would be less than those associated with Alternatives 3 and 4, since most of the contaminated soils would remain in place undisturbed (e.g., not excavated) and covered with clean soil. Alternatives 3 and 4 include additional short-term impacts associated with excavation and transportation – either back to the main portion of OU2 or to an off-site disposal facility – of all contaminated soils. Air monitoring and dust control measures would be implemented during the construction work to limit the risk to residents and on-site personnel.

Implementability

OU1

- **Carus Plant Area:** Alternatives 5 and 6 would be the simplest to implement. Alternative 4 would pose some challenges during implementation, including excavating in the vicinity of existing site pavement and structures and coordinating the excavation work to minimize disruption to plant operations, but these challenges would not be difficult to overcome.
- **Slag Pile Area:** Alternatives 4 and 12 would be difficult to implement because the entire slag pile, including materials beneath the water table, would need to be excavated and moved. Alternatives 5 and 6 would be easier to implement than Alternatives 4 and 12, particularly when implemented in conjunction with either Alternative 14 or 15. Extra care would be needed to ensure safe access for workers and equipment during sloping, benching, and revetment construction.

OU2

- **Main Industrial Area:** All of the Main Industrial Area alternatives could be readily implemented. The treatment technologies used in Alternatives 2, 3 and 4 are widely-used and available. However, Alternative 4 would require the excavation area to remain open while the excavated soil undergoes the soil-washing treatment, and the open excavation would need to be managed to deal with rain water and infiltrating groundwater, making it not quite as easily implemented as the other alternatives.
- **North Area:** All of the North Area alternatives are considered implementable.
- **Building 100 Area:** All of the Building 100 Area alternatives could be readily implemented.
- **Rolling Mill Area:** All of the Rolling Mill Area alternatives could be readily implemented. The treatment technology used in Alternative 4 is widely-used and available. However, Alternative 4 would require the excavation area to remain open while the excavated soil undergoes the soil-washing treatment, and the open excavation would need to be managed to deal with rain water and infiltrating groundwater, making it not quite as easily implemented as the other alternatives.
- **Off-Site Residential Area:** Alternative 2 would be difficult to implement, since installing a soil cover at each contaminated property would require raising the grade of a yard and would cause technical and administrative challenges. Alternatives 3 and 4 are considered implementable.

Cost

OU1

- **Carus Plant Area:** Alternative 4 is the most expensive Carus Plant Area alternative. Alternatives 5 and 6 have similar costs, with Alternative 5 costing slightly less.
- **Slag Pile Area (including Slope Stability):** Alternative 4 is the most expensive Slag Pile Area alternative. Alternative 12 is the next most expensive, costing roughly one-half as much as Alternative 4. Alternatives 5 and 6 cost approximately the same amount, and are the least expensive primary alternatives for the Slag Pile Area. The two add-on alternatives that address slope stability cost roughly the same amount.

OU2

- **Main Industrial Area:** Alternative 4 is the most expensive Main Industrial Area alternative, and Alternative 5 is the next most expensive alternative. Alternative 3 is the third most expensive alternative, costing less than one-half as much as Alternative

4. Alternative 2 is the least expensive alternative, costing less than one-half as much as Alternative 3.
- **North Area:** Alternative 5 is the most expensive North Area alternative. Alternative 4 is the second most expensive alternative, costing less than one-half the cost of Alternative 5. Alternative 3 is the third most expensive alternative. The least expensive option is Alternative 2, which involves no active remediation measures.
 - **Building 100 Area:** Alternative 4 is the most expensive Building 100 Area alternative. Alternative 3 is the next most expensive alternative, costing less than one-half as much as Alternative 4. The least expensive option is Alternative 2, which involves no active remediation measures.
 - **Rolling Mill Area:** Alternative 4 is the most expensive Rolling Mill Area alternative. Alternatives 5 and 3 are the second and third most expensive alternatives, respectively. The least expensive option is Alternative 2, which involves no active remediation measures.
 - **Off-Site Residential Area:** Alternative 4 is the most expensive Off-Site Residential Area alternative, and Alternative 2 is the second most expensive. Alternative 3 is the least expensive alternative. All three alternatives are estimated to cost \$100 million or more because of the large number of residential properties that are estimated to require cleanup.

State/Support Agency Acceptance

As the support agency, IEPA expressed its support for the preferred alternatives in the Proposed Plan. However, IEPA has indicated that there may be a potential change in the land use designation for the OU2 North Area in the future. EPA's proposed (and selected) alternative for the North Area is based on commercial/industrial land use, which is consistent with the current zoning for that area. Should the land use for the OU2 North Area change in the future, EPA will consider modifying the remedy for that area to reflect and be protective of the exposure scenarios associated with the new land use.

Recognizing the potential for a remedy change at the OU2 North Area in the future, the alternatives supported by IEPA based on current land uses at the site are listed below.

OU1

- **Carus Plant Area:** Alternative 6 – Soil Cover
- **Slag Pile Area (including Slope Stability):** Alternative 6 – Soil Cover, in conjunction with Alternative 15 – Sloping and Benching + Plantings + Revetments at the Toe of the Slope + BMPs

OU2

- **Main Industrial Area:** Alternative 2 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **North Area:** Alternative 4 – Soil Excavation + On-Site Consolidation under a Soil Cover (subject to EPA’s consideration of a remedy modification for this area should the designated land use change in the future, as noted above)
- **Building 100 Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **Rolling Mill Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **Off-Site Residential Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

Community Acceptance

During the public comment period, the community expressed general support for cleanup of the Site as a whole. The community did express concerns regarding the Off-Site Residential Area, including the length of time it will take to conduct the cleanup. One commenter expressing the opinion that EPA should not select a remedy for the Off-Site Residential Area until all residential properties had been tested. EPA’s responses to the public comments received during the public comment period are provided in the Responsiveness Summary in Part 3 of this ROD.

2.11 Principal Threat Wastes

The principal threat concept is applied to the characterization of “source material” at a Superfund site. Source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contaminants to groundwater, surface water or air, or acts as a source for direct exposure. EPA has defined principal threat wastes as those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(1)(iii)(A)).

The majority of the wastes at the Site are low-level threat wastes that are not highly toxic or highly mobile, and that can reliably be contained on site. However, some samples from the OU1 Slag Pile Area and the OU2 Main Industrial Area exceeded TCLP criteria and are therefore classified as hazardous waste due to their characteristics. These hazardous wastes are considered to be principal threat wastes.

For the OU1 Slag Pile Area, only Alternative 12 includes the use of treatment, as that alternative includes moving the wastes to an on-site consolidation area and any characteristically hazardous wastes would need to be treated in-situ to render them non-hazardous. None of the Slag Pile Area alternatives that leave the slag pile in place include

the use of treatment, because treatment of the large slag pile, if not being excavated, is not practicable or cost-effective.

For the OU2 Main Industrial Area, Alternatives 2, 3, and 4 include the use of treatment technologies that would address the principal threat wastes.

2.12 Selected Remedy

The Selected Remedy for the Site is comprised of the individual selected alternatives for each different area of the Site. The selected alternative(s) for each area of the Site are listed below, followed by a summary of the rationale for why those alternatives were selected. A more detailed description of the Selected Remedy is provided further below.

OU1 Selected Alternatives

- ***Carus Plant Area:*** Alternative 6 – Soil Cover
- ***Slag Pile Area (including Slope Stability):*** Alternative 6 – Soil Cover, in conjunction with Alternative 15 – Sloping and Benching + Plantings + Revetments at the Toe of the Slope + BMPs

Summary of Rationale for the OU1 Selected Alternatives

The selected alternatives for OU1 were chosen over the other alternatives because they are expected to achieve long-term risk reduction, will meet the RAOs within a reasonable time frame and at a reasonable cost, and will allow the OU1 property to be used for the current and reasonably anticipated future land use, which is commercial/industrial. The selected alternatives include the use of ICs and property access restrictions to ensure long-term effectiveness and permanence. EPA has determined that the selected alternatives for OU1 provide the best balance of tradeoffs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site disposal without treatment, and considering IEPA and community acceptance.

OU2 Selected Alternatives

- ***Main Industrial Area:*** Alternative 2 – Soil Excavation + On-Site Consolidation under a Soil Cover
- ***North Area:*** Alternative 4 – Soil Excavation + On-Site Consolidation under a Soil Cover
- ***Building 100 Area:*** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

- **Rolling Mill Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover
- **Off-Site Residential Area:** Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

Summary of Rationale for the OU2 Selected Alternatives

The selected alternatives for OU2 were chosen over the other alternatives because they are expected to achieve long-term risk reduction, will meet the RAOs within a reasonable time frame and at a reasonable cost, and will allow the on-facility property to be used for the current and reasonably anticipated future land use, which is commercial/industrial, and the off-site residential properties to be used for the current and reasonably anticipated future land use, which is residential. The selected alternatives for the on-facility portions of OU2 include the use of ICs and property access restrictions to ensure long-term effectiveness and permanence. ICs will be needed for the Off-Site Residential Area only if contamination extends deeper than the maximum excavation depth of two feet. EPA has determined that the selected alternatives for OU2 provide the best balance of tradeoffs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site disposal without treatment, and considering IEPA and community acceptance.

Site-Wide Groundwater

As noted earlier, EPA is not selecting a remedy for groundwater at the Site. EPA believes that the exceedances of the State’s Class II groundwater standards do not warrant CERCLA action. Although the risk assessment showed that there are unacceptable risks associated with the hypothetical ingestion of groundwater at the Site, the groundwater ingestion pathway is not a reasonably-anticipated exposure pathway. The groundwater at the Site is classified as non-potable groundwater, and ICs to prohibit the use of groundwater as a water supply are already in place. IEPA may choose to establish a groundwater management zone at the Site pursuant to regulations in the Illinois Administrative Code related to groundwater quality (35 IAC, Subtitle F, Chapter I, Part 620), but this is not part of EPA’s Selected Remedy. EPA anticipates that the Selected Remedy, once implemented, will control the Site-related sources of groundwater contamination, and that the level of groundwater contamination will decrease over time.

Although EPA is not selecting a groundwater remedial action, groundwater monitoring is included as part of the Selected Remedy. The purpose of the groundwater monitoring is to evaluate the impact of the Selected Remedy on groundwater concentrations over time.

Detailed Description of Selected Remedy

For both OUs, an Institutional Control Management Plan (ICMP) will be prepared for the Site. The ICMP will detail the land and groundwater use restrictions to be implemented. The ICMP will include a checklist of elements to be assessed during regularly scheduled

on-site inspections. Appropriate long-term restrictions, such as restrictive covenants, will be put in place on the Site ensuring that the remedy remains protective of human health and the environment. The ICMP will be prepared following EPA Guidance entitled *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites* (OSWER 9355.0-89, EPA-540-R-09-001 - November 2010 - Interim Final).

OU1

Carus Plant Area: Alternative 6 – Soil Cover

This alternative includes remedial action components that will reduce exposure to contaminant concentrations in the soil by placing a clean soil cover over contaminated soils. This alternative also includes controls to reduce potential risks and hazards from exposure to contamination by implementing ICs and property access restrictions.

The results of the risk assessment and the preliminary identification of areas to be covered assumed all soil at the Plant Area was available for direct contact. However, the majority of the Plant Area is currently covered with asphalt or concrete. In areas where the existing asphalt or concrete cover has been damaged or new cover is necessary to reduce potential direct exposure risks, a soil cover will be placed. The Plant Area cover for Alternative 6 is a soil cover, which will be placed after sub-grade excavation to acquire proper grade.

A gravel-paved storage area is located in the northeast portion of the Plant Area. As part of Alternative 6, accumulated soil and vegetation will be removed from the storage area and disposed of on site with the slag at the Slag Pile Area. The quantity of accumulated material in the storage area is expected to be small and insignificant relative to the existing material currently present at the Slag Pile Area. Following removal of the accumulated material, the base, side slopes, and top edges of the storage area will then be lined with asphalt. Total asphalt placement in the storage area is assumed to be approximately 4,100 square yards.

The total present worth cost for OU1 Plant Area Alternative 6 is estimated to be \$1,620,000. The estimated implementation time is 1 month.

Slag Pile Area (including Slope Stability) Alternative 6 – Soil Cover, in conjunction with Alternative 15 – Sloping and Benching + Plantings + Revetments at the Toe of the Slope + BMPs

This alternative includes the removal of the existing Slag Pile Area vegetation, and excavation, sloping, and benching of the Slag Pile along the LVR. At a maximum, the excavation, sloping, and benching will result in a 1:2 vertical-to-horizontal slope with 5-foot-wide benches at approximately 32-foot elevation intervals. A minimum 2-foot thick cover consisting of 6 inches of clayey topsoil over a minimum 18 inches of compacted soil or 18 inches of compacted low permeability clay will be placed in a minimum of two

compacted layers. The benches on the slope will be graded, draining surface flow down chutes to the LVR.

The toe of the slope along the river may include, if necessary, an 8-foot-wide retained bench, which is 3 to 5 feet above the low river level. The toe of slope and top of bench, to an approximate elevation of 475 feet above mean sea level, will be protected with 18 inches of riprap over geotextile for river erosion protection. An exception to the 1:2 vertical-to-horizontal slope is the slope along the LVR near the holding pond located at the south end of OU1; the excavation and sloping along the LVR near the holding pond will be at a minimum 1:2.5 (vertical to horizontal). The 1:2.5 slope will also be used as the exterior slope for the east side (river side) berm of a modified and newly-constructed holding pond and NPDES discharge point. The east side berm or top of the west side hill may also function as a haul route for delivery of soils and materials for OU1 and OU2 remedial action work. In that case, revised grading along the pond would be needed. This alternative also includes high density tree planting to further stabilize the slope. The two-foot cover will be sufficient to support the anticipated tree root depth. During the development of this alternative, areas to be covered for the protection of human health were identified on a sample-specific basis by comparing measured concentrations of COCs in soil/solid matrix to the PRGs. Specifically, the cover footprint was defined as follows:

- Soil locations were identified for covering if any COC in surface (0 to 2 ft bgs) or subsurface (>2 ft bgs) soil exceeded the PRG for commercial/industrial workers, utility workers, or construction workers.
- The horizontal extent of the area for each location was identified based on adjacent sample results and best professional judgment.

The Slag Pile Area soil cover will consist of 2 feet of soil used to grade the area. The preliminary grading plan for the Slag Pile Area is shown in Figure 8.

The total present worth cost for OU1 Slag Pile Alternative 6 and Alternative 15 is \$25,211,000. The estimated implementation time is 19 months.

OU2

For OU2, the pre-design activities described below have been assumed for on-site soil areas. The cost estimates assume the collection of up to 5 surface and 5 subsurface soil samples (plus quality control samples, for a total of 12 samples) per acre, at a cost of \$3,900 per acre. The cost estimates also assume the following: the samples will be collected using a direct-push drill rig and will consist of a surface sample between 0 and 2 ft bgs and a subsurface sample between 2 ft bgs and refusal; and the samples will be analyzed for a subset of the following analyses, as required: metals (including hexavalent chromium), PAHs, VOCs, and disposal analyses. The cost of the pre-design investigation is included in each selected alternative. For OU2, all present physical hazards will be demolished during site preparations.

Each surface and subsurface structure on OU2 will be assessed by a structural engineer to evaluate if the structure poses a safety hazard while implementing the Selected Remedy. In addition, asbestos was noted in building material samples collected in the Main Industrial Area during the RI. Although no bulk asbestos product was observed during the RI, the areas where positive asbestos samples were collected will be inspected by a Licensed Asbestos Site Inspector prior to demolition. If asbestos-containing material (ACM) is observed, the ACM will be collected, bagged, and disposed of properly. If the structure is deemed to be structurally unsound and any identified ACM has been removed, the structure will be demolished and the material will be crushed and disposed of within the on-site consolidation area. If possible, some crushed material will be used on site as a recycled material as road base or backfill and metal will be sent off site to a recycling facility. If the structure is deemed structurally sound and safe, the structure will be left as is.

Each physical hazard will be demolished using heavy construction equipment and under the supervision of an engineer. No explosives will be used during demolition. Continuous dust suppression techniques, such as wetting, will be utilized to minimize dust generation during demolition activities. Perimeter air monitoring will be performed during demolition and samples will be collected and analyzed for particulates, metals, and asbestos. Above-ground and subsurface building foundations and walls will be demolished. The construction/demolition (C/D) debris will be stockpiled on site in the Main Industrial Area. Wood debris will be stockpiled separately and will be transported off site for disposal. Metal debris will be stockpiled separately and will be recycled off site. Any C/D debris that appears to be contaminated (for example, with petroleum products, asbestos, etc.) will be stockpiled separately with like material and will be inspected by the on-site Engineer and/or Licensed Asbestos Inspector. Contaminated pieces of C/D debris will not be placed within the consolidation area; such material will be transported off site to a licensed disposal facility. Any C/D material that exists on OU2 in the form of debris piles will also be addressed. The piles will be separated by material type, as needed, and non-C/D material will be added to the consolidation area.

Subsurface voids, such as manholes and the abandoned sewer line, will be filled with a flowable fill material. The flowable fill will be pumped into the sewer line from manholes located throughout OU2. Any water present in subsurface physical hazards will be pumped out, tested, and treated or disposed of accordingly. The cost estimates assume that water present in the acid tanks will be transported off site for treatment and disposal as a hazardous liquid.

Main Industrial Area: Alternative 2 – Soil Excavation + On-Site Consolidation under a Soil Cover

This alternative includes remedial action components to contain contaminated soil within an on-site consolidation area. The on-site consolidation area is expected to be located within the Main Industrial Area. Impacted soils outside the planned consolidation area will be excavated and moved to the consolidation area, where all impacted soils will be contained beneath a soil cover. Any excavated soils that are characteristically hazardous

will be addressed with in-situ treatment in accordance with EPA's Area of Contamination Policy. This policy allows for the consolidation of contiguous contamination into one area, which can then be treated in-situ, capped in place, or processed within this area to improve its structural stability. The on-site consolidation area will be located within the same contiguous area of contamination. The characteristically hazardous waste will be consolidated within the consolidation area and treated in-situ. The treatment method to be used as part of this alternative is presumed to be chemical stabilization but will be evaluated during the remedial design.

This alternative controls potential exposure risks and hazards by limiting direct contact with contaminated soil by consolidating soils exceeding cleanup levels under a soil cover. In addition, all physical hazards will be demolished and the nonhazardous materials not separated out for recycling/reuse will be consolidated in the on-site consolidation area.

Soil will be excavated from the Main Industrial Area. Soil beneath Building 1943 will not be excavated because the building will not be demolished. Prior to excavation, demolition of subsurface structures and obstructions will occur. Demolition debris, including concrete foundation, steel piping, etc., will be separated and classified for either on-site consolidation or off-site disposal. The excavated material will be stockpiled in the Main Industrial Area and transferred into the consolidation area on a regular basis, once the consolidation area is fully prepared and ready to accept excavated soil. To limit dust creation, excavated material will be covered and perimeter air monitoring will be conducted during soil handling activities. Additional precautions such as soil wetting will be implemented if necessary to limit dust creation during excavation and soil handling activities.

After all contaminated soil has been moved to the on-site consolidation area it will be covered with a soil cover. The soil cover will consist of 2 feet of compacted clay with a hydraulic conductivity of $1E-07$ cm/s or less, followed by 1 foot of topsoil, which will restrict direct contact with contaminated soil. A permeable geotextile liner will be placed on top of the contaminated soil to demarcate the clean cover from the contaminated soil. Erosion mats will be installed to protect and stabilize the cover along the top and slopes of the consolidation area. A storm water drainage system will be installed on each slope of the consolidation area and around the perimeter to drain water from the consolidation area into the existing LaSalle storm water system.

The total present worth cost for Main Industrial Area Alternative 2 is \$34,800,000. The estimated implementation time is 26 months.

North Area. Alternative 4 – Soil Excavation + On-Site Consolidation under a Soil Cover

This alternative addresses potential risks and hazards from exposure to contaminated soil by excavating soil exceeding cleanup levels, based on the pre-design investigation results, and placing those soils in the on-site consolidation area under a soil cover. To limit dust creation, excavated material will be covered and perimeter air monitoring will be conducted during soil handling activities. Additional precautions such as soil wetting

will be implemented if necessary to limit dust creation during excavation and soil handling activities.

The total present worth cost for North Area Alternative 4 is \$14,900,000.⁶ The estimated implementation time is 7 months.

Building 100 Area: Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

This alternative addresses potential risks and hazards from exposure to contaminated soil by excavating soil exceeding cleanup levels, based on the pre-design investigation results, and placing those soils in the on-site consolidation area under a soil cover. In addition, all physical hazards will be demolished and the nonhazardous materials not separated out for recycling/reuse will be consolidated in the on-site consolidation area.

Soil will be excavated from the Building 100 Area. Soil beneath the building in the Building 100 Area will not be excavated because the building will not be demolished. Prior to excavation, demolition of subsurface structures and obstructions will occur. To limit dust creation, excavated material will be covered and perimeter air monitoring will be conducted during soil handling activities. Additional precautions such as soil wetting will be implemented if necessary to limit dust creation during excavation and soil handling activities.

The total present worth cost for Building 100 Area Alternative 3 is \$3,200,000. The estimated implementation time is 4 months.

Rolling Mill Area: Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

This alternative addresses potential risks and hazards from exposure to contaminated soil by excavating soil exceeding cleanup levels, based on the pre-design investigation results, and placing those soils in the on-site consolidation area under a soil cover. In addition, all physical hazards will be demolished and the nonhazardous materials not separated out for recycling/reuse will be consolidated in the on-site consolidation area.

Soil will be excavated from the Rolling Mill Area. Soil beneath the building in the Rolling Mill Area will not be excavated because the building will not be demolished. Prior to excavation, demolition of subsurface structures and obstructions will occur. To limit dust creation, excavated material will be covered and perimeter air monitoring will be conducted during soil handling activities. Additional precautions such as soil wetting will be implemented if necessary to limit dust creation during excavation and soil handling activities.

⁶ See footnote 5, earlier in this ROD, regarding the cost estimate for the North Area.

The total present worth cost for Rolling Mill Area Alternative 3 is \$3,600,000. The estimated implementation time is 3 months.

Off-Site Residential Area. Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover

This alternative addresses potential risks and hazards from exposure to contaminated soil by excavating soil exceeding cleanup levels, based on pre-design investigation results, and placing those soils in the on-site consolidation area under a soil cover.

In order to estimate the percentage of properties that likely require remedial action, the Off-Site Residential Area was divided into four zones, based on the density of properties sampled during the RI and distance from the on-site areas of OU1 and OU2. Figure 9 shows the approximate locations of the residential samples collected during the RI as well as the four evaluation zones. The percentage of properties tested during the RI in each separate zone that had concentrations exceeding cleanup levels was used to extrapolate the RI results to the entire zone, resulting in an estimated total number of properties within each zone that are likely to require cleanup. Based on the assumptions used in the FS (including use of 400 mg/kg lead PRG), an estimated 2,778 of the nearly 5,000 properties in the Off-Site Residential Area are expected to require cleanup, with an estimated volume of approximately 200,000 cubic yards of soil to be excavated. The actual number of properties to be remediated and the depth of cleanup needed at each property will be established during the remedial design phase. EPA's re-evaluation during the remedial design of the interim lead cleanup level selected in this ROD for the Off-Site Residential Area may also impact the number of properties requiring cleanup. Since only a small percentage (4%) of the residential properties were tested during the RI, many additional properties remain to be tested.

For cost-estimating purposes, the maximum excavation depth of 24 inches bgs was assumed. However, the required excavation depth at any given property may be less, based on that property's sample results.

In the event that contamination extends deeper than 24 inches bgs at any residential properties, a visual barrier, such as orange construction fence or landscape fabric, will be placed on top of the contaminated soil at 24 inches bgs before the excavation is backfilled with clean soil. In such cases, ICs will need to be implemented, and an ICMP will be prepared following EPA guidance. However, since only surface soil samples were collected from residential properties during the RI, it is not currently known whether residential properties have contamination at depth. The remedial design sampling will determine whether any residential properties have contamination exceeding cleanup levels at depths greater than 24 inches bgs.

Soil wetting will be implemented as necessary to limit dust creation during excavation and soil handling activities. At each residential property, excavated areas will be backfilled with clean soil, including 6 inches of topsoil, to maintain the original grade. Each yard will be restored as closely as practicable to its pre-remedial-action condition.

The cost estimate assumed that excavated yards at residential properties would be sodded and that non-residential properties, such as schools, parks, commercial/industrial properties, etc., would be seeded. Once the properties are sodded or seeded, maintenance of the sod/seed, including watering, fertilizing, and cutting, will be conducted for 30 days. After the initial 30-day period, property owners will be responsible for the maintenance of their yards.

Due to the large number of properties that are likely to require cleanup, and the length of time required before all the properties can be addressed, EPA will consider using a phased approach for the residential cleanup activities. Properties might be prioritized in order to address properties with higher concentrations of COCs first, where sensitive receptors are present, and/or where children with elevated blood lead levels are present. These decisions will be made during the remedial design phase.

The total present worth cost for Off-Site Residential Area Alternative 3 is \$112,925,000. The estimated implementation time is 177 months.

Expected Outcomes of the Selected Remedy

The selected remedies at the Site will reduce the risks to human health and the environment by reducing contamination to levels within EPA's acceptable risk range. This will be accomplished by covering contaminated soil and slag in OU1 with a clean soil cover and by excavating contaminated soil from across OU2 (including the Off-Site Residential Area) and consolidating it within a properly covered on-site containment cell.

As shown in the chart below, the land use for the Off-Site Residential Area will remain residential following implementation of the remedy. The land use for OU1 and all other areas of OU2 will remain commercial/industrial following implementation of the remedy.

Construction Timeframes and Resulting Land Uses

Area of site	Available uses of land upon achieving cleanup levels	Construction timeframe required to achieve cleanup levels*
OU1		
Carus Plant Area	commercial/industrial	1 month
Slag Pile Area	commercial/industrial	19 months
OU2		
Main Industrial Area	commercial/industrial	26 months
North Area	commercial/industrial	7 months
Building 100 Area	commercial/industrial	4 months
Rolling Mill Area	commercial/industrial	3 months
Off-Site Residential Area	residential	177 months

*Note. the construction timeframes listed here assume full funding is available to complete the work as envisioned by the FS cost estimates. Additionally, construction may not occur simultaneously at all Site areas

The selected cleanup levels for soils are listed below and also are provided on page 2 of Table 2. Table 2 also describes the basis for each cleanup level. All of the PRGs were adopted as final cleanup levels, except for lead, whose PRGs for on-site soils and Off-Site Residential Area soils were selected as *interim* cleanup levels.

Selected Cleanup Levels for Soils

COC	Cleanup Level for On-Site Soil (all areas except Off-Site Residential Area) (all units are mg/kg unless otherwise noted)	Cleanup Level for Off-Site Residential Area Soil (mg/kg)
Antimony	118.8	–
Arochlor-1248	4.2	–
Arochlor-1260	4.2	–
Arsenic	37.0	18.0
Asbestos	1%	–
Benzo(a)anthracene	21.1	–
Benzo(a)pyrene	2.1	–
Benzo(b)fluoranthene	21.1	–
Cadmium	263.9	6.4
Chromium (hexavalent) ¹	214.9	1.0
Cobalt	88.6	–
Copper	11,879	–
Cyanide	3.0	–
Dibenzo(a,h)anthracene	2.1	–
Indeno(1,2,3-cd)pyrene	21.1	–
Lead	800*	400*
Manganese	6,778	1,056
Mercury	4.8	–
Thallium	3.2	–
Trichloroethene	3.2	–
Zinc	89,091	1,379

¹Hexavalent chromium was assumed to be present as a percentage of total chromium. Additional investigation is needed during the remedial design to determine if hexavalent chromium is present and should be retained as a COC.

*The lead values in this table are interim cleanup levels. EPA will re-evaluate the lead cleanup levels in light of OLEM Directive 9200 2-167, dated December 22, 2016, and will address any revisions to the cleanup levels in an appropriate decision document.

Cost of the Selected Remedy

The cost of the selected remedial alternative for each area of the Site is listed in the table below, along with the cost of the remedy for each OU and for the Site as a whole. A detailed cost estimate for the Selected Remedy is provided in Table 6.

Remedy Costs

OU and Area	Total Present Worth Cost of Selected Alternatives
OU1 – Plant Area	\$1,620,000
OU1 – Slag Pile Area	\$25,211,000
OU1 Total Cost	\$26,831,000
OU2 – Main Industrial Area	\$34,800,000
OU2 – North Area	\$14,900,000
OU2 – Building 100 Area	\$3,200,000
OU2 – Rolling Mill Area	\$3,600,000
OU2 – Off-Site Residential Area	\$112,925,000
OU2 Total Cost	\$169,425,000
TOTAL COMBINED COST	\$196,256,000

ARARs for the Selected Remedy

The ARARs for the Selected Remedy are discussed above in Section 2.9 and 2.10 and are listed in Table 3.

2.13 Statutory Determinations

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes. The following sections discuss how the Selected Remedy meets these statutory requirements.

Protection of Human Health and the Environment

OU1

- ***Carus Plant Area:*** The selected alternative (Alternative 6 – Soil Cover) will provide overall protection of human health and the environment by placing a soil cover over contaminated media. It will achieve RAOs immediately upon completion, which is estimated at one month. The remedy will then be protective for commercial/industrial purposes.
- ***Slag Pile Area:*** The selected alternatives (Alternative 6 – Soil Cover, and Alternative 15 – Sloping and Benching + Plantings + Revetments + BMPs) will provide overall protection of human health and the environment by sloping, benching and covering contaminated media under a soil cover. Plantings and revetments will also be used to stabilize the slope. It will achieve RAOs immediately upon completion, which is

estimated at 19 months. The remedy will then be protective for commercial/industrial purposes.

OU2

- **Main Industrial Area:** The selected alternative (Alternative 2 – Soil Excavation + On-Site Consolidation under a Soil Cover) will provide overall protection of human health and the environment by excavating and consolidating contaminated media within an on-site consolidation area and covering the contaminated media with a soil cover. Soils identified as characteristically hazardous will be consolidated and treated in-situ before being covered with a soil cover. The selected alternative will achieve RAOs immediately upon completion, which is estimated at 26 months. The remedy will then be protective for commercial/industrial purposes.
- **North Area:** The selected alternative (Alternative 4 – Soil Excavation + On-Site Consolidation under a Soil Cover) will provide overall protection of human health and the environment by excavating and placing contaminated media under a soil cover within an on-site consolidation area. It will achieve RAOs immediately upon completion, which is estimated at 7 months. The remedy will then be protective for commercial/industrial purposes.
- **Building 100 Area:** The selected alternative (Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover) will provide overall protection of human health and the environment by excavating and placing contaminated media under a soil cover within an on-site consolidation area. It will achieve RAOs immediately upon completion, which is estimated at 4 months. The remedy will then be protective for commercial/industrial purposes.
- **Rolling Mill Area:** The selected alternative (Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover) will provide overall protection of human health and the environment by excavating and placing contaminated media under a soil cover within an on-site consolidation area. It will achieve RAOs immediately upon completion, which is estimated at 3 months. The remedy will then be protective for commercial/industrial purposes.
- **Off-Site Residential Area:** The selected alternative (Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover) will provide overall protection of human health and the environment by excavating and placing contaminated media under a soil cover within an on-site consolidation area. It will achieve RAOs for each impacted property immediately upon the completion of cleanup work at each individual property, and will achieve RAOs for the entire Off-Site Residential Area immediately upon completion of the residential cleanup, which is estimated at 177 months. The remedy will then be protective for residential purposes.

Compliance with Applicable or Relevant and Appropriate Requirements

The Selected Remedy is expected to comply with the federal and state ARARs that are specific to the Selected Remedy. The ARARs for this action are discussed above in Sections 2.9 and 2.10 and are listed in Table 3.

Cost-Effectiveness

In EPA's judgment, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP Section 300.430(f)(1)(ii)(D)). The selected alternatives for OU1 and OU2 are cost-effective and will immediately achieve their RAOs after completion of construction. After considering the cost-effectiveness of the various cleanup alternatives using cleanup levels based on background and various risk levels within EPA's acceptable risk range, EPA selected cleanup levels for the Site based on a risk level of 1E-05 (with the exception of arsenic in the Off-Site Residential Area and lead, as discussed in the "Preliminary Remediation Goals" portion of Section 2.5, above). This will conserve approximately \$25 million compared to using cleanup levels based on a risk level of 1E-06.⁷ The Selected Remedy is long-term effective and permanent and will reduce exposure to contaminated materials.

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

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a practicable manner at the Site. Treatment of the wastes is a component of the selected alternative for the OU2 Main Industrial Area, where excavated soils that are characteristically hazardous will be consolidated within the on-site consolidation area and treated in-situ prior to being covered. Treatment of the characteristically hazardous wastes at the OU1 Slag Pile Area is impracticable due to the large volume of the slag pile, which is being left in place and covered to reduce risks to acceptable levels. Treatment of the low-level threat wastes in other areas of the Site is impracticable because that contamination does not lend itself to any cost-effective treatment. Long-term effectiveness will be achieved through engineering controls that will be monitored and maintained, in conjunction with institutional controls. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the selected alternatives provide the best balance of tradeoffs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site disposal without treatment, and considering IEPA and community acceptance.

⁷ EPA also notes that, for some COCs, cleanup levels based on a risk level of 1E-06 would be below background and not achievable.

Preference for Treatment as a Principal Element

The Selected Remedy uses treatment technologies to reduce the mobility of the principal threat wastes at the OU2 Main Industrial Area. Treatment of the principal threat wastes at the OU1 Slag Pile Area is not considered practicable or cost-effective.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on the Site above levels that allow for UU/UE, statutory review of the remedy's protectiveness will be conducted every five years.

2.14 Documentation of Significant Changes

CERCLA Section 117(b) and NCP Section 300.430(f)(5)(iii) require an explanation of any significant changes from the remedy presented in the Proposed Plan that was published for public comment. The Proposed Plan was issued for public comment on October 5, 2015. The Proposed Plan public comment period ran from October 5, 2015, through December 12, 2015.

EPA reviewed all written and verbal comments submitted during the public comment period and determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate as a result of public comment. However, as noted above in Section 1.4, the lead cleanup numbers selected in this ROD for residential and commercial/industrial portions of the Site are considered interim cleanup levels. New EPA guidance, entitled *Updated Scientific Considerations for Lead in Soil Cleanups* (OLEM Directive 9200.2-167, December 22, 2016), highlights the current science and risk assessment tools that EPA Regions may consider when addressing lead-contaminated soils at CERCLA sites. In light of this new guidance, EPA will re-evaluate the lead cleanup levels for this Site during the remedial design phase, prior to initiating the remedial action. Any changes to the lead cleanup levels will be addressed in an appropriate future decision document.

One other minor change from the proposed plan is that this ROD selects a cleanup level for asbestos in soil, as opposed to determining the appropriate cleanup level during remedial design.

Part 3 – Responsiveness Summary

In accordance with CERCLA Section 117, 42 U.S.C. Section 9617, EPA issued the Proposed Plan on October 5, 2016. The public comment period ran through December 12, 2016. EPA published the AR for the Proposed Plan and held public meetings regarding the Proposed Plan on October 20 and December 3, 2016, at the LaSalle Peru Township High School in LaSalle, Illinois. Approximately 40 people attended the first meeting and 60 people attended the second meeting. Representatives from EPA and IEPA were present at both public meetings, and a representative from the Agency for Toxic Substances and Disease Registry was present at the second meeting. Written transcripts from the public meetings are available in the AR for this ROD. The AR index is attached to this ROD as Appendix 3.

EPA is not required to reprint each public comment verbatim and may paraphrase where appropriate. In this responsiveness summary, EPA has paraphrased certain comments and included large segments of the original language of other comments. Comments shown in quotation marks represent the original comment (or portion thereof) as received by EPA. Persons wishing to see the full text of the comments should refer to the original comments, which are included in the AR.

The comments and responses below are grouped as follows: comments from private citizens are presented first, followed by comments from representatives of the City of LaSalle, and finally by comments from potentially responsible parties or their representatives.

COMMENTS FROM PRIVATE CITIZENS

1. **Comment:** Several people asked whether it is safe to eat homegrown produce from their yards.

Response: *As part of the Superfund cleanup process, EPA conducts site-specific risk assessments to address the unique contaminants and range of potential exposure scenarios at a site. At the Matthiessen and Hegeler Zinc Site, EPA found that there is some risk to people who come into contact with contaminated soil on residential property. While the chance of becoming sick as a result of exposure to the contaminants is small, it is serious enough to require that actions be taken to reduce the risk of exposure to the contaminants present in the soil.*

To date, EPA has not identified an actionable risk associated with ingestion of homegrown produce, but EPA will continue to evaluate the data as more properties are tested during the remedial design phase. To help reduce potential risks associated with the ingestion of homegrown produce, EPA recommends the following actions. (1) wash all produce to remove dirt before cooking or consuming, (2) peel or remove the skin from fruits and vegetables, especially for root produce (such as carrots and potatoes); and (3) to the extent practicable, grow produce in raised beds or pots filled with commercially-available gardening soil.

2. **Comment:** Several people raised concerns related to public involvement at the Site and requested that EPA hold additional public meetings and provide additional information.

Response: *In response to concerns raised at the public meeting and in comments on this proposed plan, EPA revised and updated the community involvement plan (CIP) for this site. Site-related documents, including the revised CIP and the fact sheets about the proposed cleanup plan that were distributed at the October and December 2015 public meetings, are available on EPA's website at <http://www.epa.gov/superfund/matthiessen-hegeler-zinc>. All factsheets, notices, and presentations are also available at the LaSalle Public Library. EPA will hold more public meetings and/or availability sessions in the future as the remedial design and remedial action cleanup work progresses.*

3. **Comment:** "As there are only 3,900 residences in LaSalle (there are only 3,900 water meters, which is the most accurate count by the city). How do you state nearly 5,000 in presentation? The materials you handed out should be revised to include the entire map of LaSalle because to show just a few homes around the plant was misleading when you later state that your proposal covers 5,000 homes."

Response: *The area to be tested around the Site was estimated, and included potential locations in both LaSalle and Peru, Illinois. The map that was part of the presentation and mailer has been revised to include the entire area surrounding the Site, not just the area adjacent to the Carus Plant area.*

4. **Comment:** Several people asked if their properties had been tested and what the results were, and whether EPA can share the results with the public. Some people also asked if there is a home test that individual property owners can use.

Response: *The sampling plans and results from the testing done during the remedial investigation are part of the Remedial Investigation Report, which is included in the AR for the Site. However, due to privacy concerns, EPA generally provides individual property test results only to the owner of that property and does not make available to the public test results that contain specific addresses, owner names, or other personally-identifiable information. EPA is not aware of any home test that can be purchased by individual property owners to gather information on contaminants in soil.*

5. **Comment:** "None of the Alternatives shown meet the criterion for Reduction of Toxicity, Mobility, or Volume Through Treatment. Are there no other Alternatives available? Are they cost prohibitive? It says that the Applicable or Relevant and Appropriate Requirements are met. Reduction of Toxicity, Mobility, or Volume Through Treatment is not an ARAR? The City of La Salle's main storm water overflow runs through the property. How will the clean-up affect this? Should the City wish to run future lines across this property how will the clean-up affect those lines?"

Response: *Remedial alternatives that include treatment options were evaluated during the feasibility study. The list of options evaluated can be found in the Feasibility Study Report, the Proposed Plan, and this ROD, all of which are included in the AR for the Site. EPA's Selected Remedy includes treatment of excavated hazardous wastes.*

“Reduction of toxicity, mobility, or volume through treatment” is one of the nine evaluation criteria that EPA uses to evaluate potential remedial alternatives, and is one of the five primary balancing criteria. The nine evaluation criteria are not applicable or relevant and appropriate requirements. ARARs include cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that either directly apply to the site or address problems or situations sufficiently similar that their use is well-suited to the site. As described earlier in this ROD, EPA is required to select alternatives that meet the two threshold criteria and that provide the best balance of the five primary balancing criteria, while taking into account state and community acceptance.

The storm water line that run through the Site will be protected during any remedial action work at the Site, and if the line is damaged it will be repaired. Following implementation of the remedial action cleanup work, a restrictive covenant will be placed on the land that will prohibit the installation of additional lines through contamination left on the Site without written approval of EPA.

6. **Comment:** “La Salle's comprehensive plan states the Site should be an interpretive park once it is remediated. My concern is that remediation will remove all cultural artifacts (structures, foundations, grades, etc.) that would be used to interpret the Site. The removal of these would remove the opportunity for the City to develop a tourist draw as well as a monument to its heritage.”

Response: *Many of the abandoned structures and foundations have unsafe concentrations of metals, and are surrounded by soil and debris that also contain unsafe levels of contamination. This information can be found in the Remedial Investigation Report in sections 2.2.3 Building Material Investigation and 4 2.3 Building Material Results. This material as it currently exists on the Site poses a risk to human health and the environment and must be remediated to reduce the unacceptable risks. Structures and foundations that don't need to be demolished as part of the Selected Remedy will remain in place at the Site.*

7. **Comment:** “Could USEPA spend \$200 on milkweed seed and let the monarch butterflies have the place? Mother Nature has encapsulated the Site for free, why disturb it?”

Response: *EPA has evaluated an array of cleanup options for the Site, including no action. The “no action” alternatives for the various areas of the Site do not address the risks to human health and the environment posed by the Site, and therefore are not protective of human health and the environment. Similarly, selecting a remedy that would only provide milkweed seed for monarch butterflies would not be protective. EPA cannot select remedial alternatives that are not protective, so the “no action” alternatives and the action suggested in this comment are not eligible for selection.*

8. **Comment:** “Since monetary constraints appear to limit the speed of site remediation and also what steps can be done in a timely fashion, doesn't Superfund look for monies from culpable parties? If not, why is this glaring problem not being addressed at cleanup sites?”

Response: *EPA has an “enforcement first” policy and actively pursues past and current owners, operators or generators at Superfund sites to contribute financially to site investigation and cleanup actions Carus conducted and paid for the remedial investigation/feasibility study at the portion of the Site it owns EPA plans to negotiate with responsible parties after the ROD is signed in an effort to get those parties to pay for cleanup work.*

9. **Comment:** “Wonder if option two is actually needed in outlying areas or is overkill. I doubt if that much territory is contaminated. If the EPA proceeds with option two and contamination does exist who pays for the replacement of the flowers/exotic plants many of us fill our property with?”

Response: *EPA will sample each residence in the area surrounding the Site to determine which properties need to be cleaned up Properties with soil concentrations exceeding EPA’s cleanup levels will need to be remediated. The cleanup and property restoration work will be paid for either by EPA or responsible parties*

10. **Comment:** “Re: Commentary on Proposed Plan, and an alternative Proposed Plan with regard to OU2, residential properties and other non-industrial parcels not otherwise listed specifically in another part of OU1 or OU2.

“My husband and I have an ownership interest in three properties that would fall under your Proposed Soil Cleanup Plan of the Matthiessen & Hegeler Zinc Superfund Site. My parents have an ownership interest in at least two additional properties thusly impacted by said Proposed Plan. My father is a former city attorney of the City of La Salle, and we both serve on several City boards.

“Not one citizen has come forward in support of the plan proposed by the EPA. I have spoken with upwards of 400 of my fellow citizens, including 7 aldermen, the City Attorney (James McPhedran), La Salle County State’s Attorney (who is my neighbor), and I appeared on a radio call in show hosted by Rod Thorson on the issue of the Proposed Plan. Not one of the citizens of the City of La Salle is happy with the plan being proposed by the EPA for several reasons.

“All of us believe that instead, we prefer my proposed plan, and ask that you adopt same and proceed to implement this plan via your Decision and Order.

“We the citizens of La Salle want to have laboratory (not XRF) soil testing of each and every parcel of land in La Salle, and we want to have input into the methodologies employed in the testing. We want the testing to include arsenic, lead, cadmium. We want to have written laboratory results provided to each resident of the tested lot and (in cases where the parcel is non-owner occupied), same should also be provided to the owner(s) of the parcel.

“We do not want any remedy beyond testing selected for us at this time because without testing, we do not possess sufficient information to make a good decision at this time (*the

EPA has tested only 4% of plots, leaving 96% of us clueless as to contamination levels). Once every parcel of land has been tested, we then want to discuss potential remedies with the EPA to jointly craft a cleanup plan that will minimize impact to our commerce, value of our land, and will consider the most cost-effective means to effectuate a well-organized cleanup. We do not believe that the EPA has sufficient data to make good decisions, and we as citizens, without these test results, are essentially being denied due process because we cannot have meaningful input in a discussion of remedies until we know from the EPA the status of our parcels. We want the right to seek more significant remedies if necessary, but also do not want land within acceptable contamination guidelines to remain unsaleable pending testing which may be 20 years away if the EPA plan was followed.

“The citizens of La Salle demand that once the testing phase is concluded, that those parcels with the greatest need for cleanup be addressed first. It may be fair to add in some scoring system whereby households testing with the highest lead concentrations and possessing children would take precedence.

“We need to explore the consequences of the various cleanup methodologies upon our infrastructure- whether it can bear the heavy machinery, whether we should consider re-routing certain traffic areas, whether we can plan cleanups necessary at school sites in the months when children are out of school, and designate public park cleanup if necessary (like Hegeler Park) at a time when we can obtain an alternate place for the children to have PE (at two schools they do all their recess and sports functions at the park). The effect on our local banks which hold the paper on La Salle properties, whether people can dig in their yards without permission from the EPA to build a fence or add an addition, whether a person will be given certification as to having a decontaminated yard if they do not consent to dig up special trees and plantings- all these questions are unanswered. Some are unanswerable perhaps, but we deserve to have far more interaction and information from the EPA prior to any determination of what our remedies and rights will be in this process.

“In short, the residential portion of the proposed plan needs to accommodate the needs of the people you seek to help. We believe that doing what I propose will save money, achieve better and faster results with far fewer unintended consequences. Best of all, if something goes amiss, you can blame us, as we requested you test first.

“I understand that to the EPA people, La Salle is just another economically depressed City. My Father's parents, who both served in the Navy during WW2 with distinction, came here for peace and quiet after WW2 to build a life for their family. My Dad was born here, my siblings and I were born here. My family is buried here, as someday I will be.

“I have moved around the country and traveled extensively, but I came here to make my home, and start my own business and raise a family. I love this place. You will only be here for a short while, but this is our home. We are long-term stakeholders here; the EPA is not. My neighbors and friends are my extended family. This is not a financially healthy city- we have most of our children qualifying for free breakfast and lunch programs, and many seniors whose only major asset is their home. Still, this is a city of a type that doesn't exist many places anymore. People slow down for yellow lights, wave to one another, and think nothing

of digging a stranger's car out of a snow bank when it is 5 degrees outside. When someone from here is sick or hurt in an accident, we come together and give until it hurts without being asked. In the past several years, our citizens alone gave to the United Way an amount in excess of what was given by the citizens of Peoria, IL, a city many hundreds of times larger in population than La Salle because the people here are good, decent, and kind people. The actor Spencer Tracy lived here until he was six years old. Nat King Cole sang in our nightclubs. A month before her tragic last flight, Amelia Earhart came here to speak in the same auditorium in which the EPA meeting was held. La Salle was the party spot of some of the most notorious gangsters of the roaring 20s, including Al Capone. James "Wild Bill" Hickock worked his first job off the farm during the construction of Lock 16 at the I & M Canal near First Street. This place is just another name, one more project to all of you, but to those of us who live here, this is a special place worth protecting and fighting for – we want you to care about this place, and us and what we think. We are grateful that the EPA wants to help us, but the wrong kind of help, at the wrong pace can be worse than no help at all. The simple changes I have proposed will conserve EPA dollars, and allow the EPA to create a far better cleanup plan, with more accurate planning. Better planning permits better execution. I beg that you please give us lab testing now, before selecting any other remedy. If you must, call the remedy further investigation, with future determination as to how, when, and where the soil cleanup will progress.

“We need to have a great deal of information to protect ourselves, and our City workers who are facing risks different than those of the average homeowner. As not one citizen favors the proposed plan, and all concerned have voiced support for my proposal, I ask that you adopt my plan with regard to the residential property portion of OU2.”

Response: *It is obvious that you care deeply about your community and the potential impact of EPA's Selected Remedy for the Off-Site Residential Area portion of the Site. EPA takes very seriously its mission to protect human health and the environment, and appreciates the suggestions you have made.*

At many Superfund sites across the country, contamination from industrial facilities has spread to neighboring properties or entire communities. When the potentially-impacted residential area surrounding a facility is large, such as at this site, EPA tests only a small fraction of the residential properties to (1) determine whether or not the facility has indeed impacted the surrounding properties, (2) to gage the approximate extent – based on a sound sampling design – of that impact, and (3) to gather enough information to select an overall remedy for the off-site area. Note that the overall remedy – in this case, excavation of contaminated soil and restoration of excavated properties – would be the same regardless of whether 4% or 100% of the properties were tested before issuing the ROD.

Once a remedy for an off-site residential area is selected in a ROD, the remedial design phase can begin. Many of the issues you raised and the suggestions you made will be addressed during the remedial design. During the remedial design, each and every property will be tested to determine if soil concentrations exceed EPA's cleanup levels and to determine the depth of cleanup required. Even those properties tested during the

remedial investigation and found to exceed cleanup levels will need to be retested to gather enough testing information for design purposes. Each 6" soil depth will be tested in different parts of each property to determine the depth of cleanup required (i.e., 0-6", 6-12", 12-18", 18-24") and whether contamination extends beyond the maximum excavation depth of 24" (i.e., 24-30") Testing will be conducted for the Off-Site Residential Area contaminants of concern – arsenic, cadmium, chromium, lead, manganese, and zinc – using some combination of XRF and laboratory analysis, as determined by EPA. When backed up with technically-sound site-specific correlations to laboratory analytical data, XRF can be an effective screening technology for obtaining cost-effective and quick soil concentrations results. Individual property owners will be notified of the results of the testing on their property.

For properties that require cleanup, existing conditions will be documented, including structures, vegetation, and other property features, so that an effective cleanup plan for each property can be developed that is tailored to the specific circumstances at each property. Decisions will be made during remedial design on the appropriate equipment and machinery to use, and engineers will be available to evaluate issues such as structural integrity and how to mitigate potential adverse impacts to property features. Property owners will be involved in discussions about how the cleanup will be implemented on their property and how their property will be restored, and the needs of each property owner will be taken into consideration as much as possible. Decisions on traffic flow patterns will also be made during the remedial design, in consultation with the city. The cleanup work at properties such as schools and parks will be scheduled at times of the year to cause the least possible disruption to the community.

Due to the large number of properties that need to be tested and the large number of properties that are likely to require cleanup, EPA acknowledges that it will be a number of years before all the properties can be addressed. This is an unfortunate reality of large residential cleanup projects. Examples of other large residential cleanups include the Jacobsville Neighborhood Soil Contamination site in Evansville, Indiana (in EPA Region 5), and the Omaha Lead site in Omaha, Nebraska (in EPA Region 7). Selecting a remedy now for the Off-Site Residential Area will allow the residential cleanup to get started much sooner than waiting until all properties are tested before proposing and selecting a remedy, as you suggest. As noted in Section 2.13 of the ROD, EPA will consider using a phased approach for the residential cleanup activities. Properties might be prioritized in order to address properties with higher soil concentrations first, where sensitive receptors are present, and/or where pregnant women or children with elevated blood lead levels are present. These decisions will be made during the remedial design phase

11. **Comment:** Several people asked EPA to define the exact boundaries of the residential contamination area, to describe which properties, yards and areas are affected, and to describe the schedule for cleanup of the various impacted areas, so people understand how and when the cleanup will happen. People also asked EPA to label all the dots on the map presented at the public meeting with the results of the testing.

Response: *The precise boundaries of the Off-Site Residential Area contamination has not yet been determined. As noted in response to Comment #10, only a small portion of the properties in the Off-Site Residential Area were tested during the remedial investigation, and all remaining properties will be sampled during the remedial design phase. Due to the size of the Off-Site Residential Area, the design sampling and the cleanup work will take a number of years to complete. EPA currently intends to test all residential properties in a methodical fashion, likely beginning closest to the former smelting facility and then working out and away from the facility, based upon the sampling results obtained during the remedial investigation. EPA intends to start cleanup work after a sufficient number of properties have been tested and designed and are ready for cleanup. From that point forward, remedial design testing and remedial action cleanup work will occur concurrently, in different areas, so that remedial design testing will continue to “feed” the cleanup project. The figure presented at the public meeting showing properties sampled to date is available in the AR. However, EPA cannot identify on a publically-available map the sample results for individual properties due to privacy concerns*

12. **Comment:** “Is the Little Vermilion River going to be cleaned up? What areas on the main plant site are going to be cleaned up? What is going to happen with the Rolling Mill building and the Office Building? What is going on inside of the Rolling Mill Building now and was the inside of the building cleaned up?”

Response: *The Little Vermilion River was tested and risks to human health and the environment were fully evaluated during the remedial investigation. The study concluded that the river is fully supportive of aquatic life use in Illinois streams and that the Site is not having a significant adverse effect on the overall health of the ecological community of the river. Based on these findings, no cleanup of the river is needed. The entire industrial portion of the Site requires remediation since it has levels of contamination that are unsafe for human health and the environment. The Rolling Mill building was cleaned up during two prior removal actions and will remain on site. The Rolling Mill building currently is being used for storage. The Office Building was not evaluated during the remedial investigation since it was not part of the production processes and did not contribute contamination to the Site, so no actions at that building are required as part of this cleanup.*

13. **Comment:** Two people asked questions related to real estate disclosure requirements. The questions were: “As a buyer in 2009 using a realtor and attorney – could they or should they have been aware of what was going on since 2007?” and “What should realtors be aware of as far as disclosure goes to potential buyers and sellers?”

Response: *In general, EPA does not comment on real estate disclosure requirements, which often vary from one state or locality to another. Any such disclosure requirements have not been identified as ARARs for this Site. EPA also cannot comment on what people in the community might or might not have been aware of in past years.*

14. **Comment:** “Why does it take so long for the EPA to do anything? When you start testing properties and giving out information, how long after testing are you going to start yard cleanup?”

Response: *EPA acknowledges that the Superfund process can be lengthy, especially for large, complex sites such as this one. As noted in the response to Comment #11, EPA intends to test properties and conduct the cleanup in a methodical, step-wise fashion, and will determine the specific approach during the remedial design phase. At another Region 5 site (the Jacobsville Neighborhood Soil Contamination site), properties tested and designed in one year are scheduled for cleanup during the following construction season, so that significant remedial design and remedial action cleanup work occurs each year.*

15. **Comment:** Several people asked whether the property value of homes around the Site would go down and who would pay for that.

Response: *Although this is a common concern at residential cleanup sites, EPA cannot predict or control the impact of the Site on residential property values*

16. **Comment:** “Has our drinking water has been tested? Can we have blood or urine tests to see if we have metals in our system?”

Response: *EPA did not test the public water supply, since the public water supply wells for both LaSalle and Peru are located up-gradient or cross-gradient from the Site, or sufficiently distant from the Site, and are not impacted by the Site. Municipalities are required to test the quality of the water they provide to residents and to provide that information to the customers they serve. As described earlier in this ROD, there are two water bearing zones at the Site and in the general area of the Site. Water bearing zone 1 (WBZ1) is the shallower zone and is comprised of unconsolidated glacial and alluvial deposits. WBZ2 is the deeper zone and is comprised of bedrock limestone and shale. Any contamination related to the Site would migrate more readily in WBZ1. Groundwater at the Site flows to the east and southeast, toward the Little Vermilion River. Groundwater from WBZ1 discharges directly to the river.*

If a person would like to have their blood or urine tested, they could contact their primary care physician.

17. **Comment:** “There was a previous cleanup at LaSalle Electric Utilities Company that never was completed. Will this cleanup stop mid-way through?”

Response: *The cleanup at this site will continue until it is complete and all unacceptable risks to human health addressed. EPA expects that a significant portion of the cleanup work – both at the former smelter facility and at the Off-Site Residential Area – will be conducted using federal cleanup funds, so the timing and pace of the cleanup work will be dependent on the availability of funding.*

18. **Comment:** “Will a surveyor be used to put back any property boundary corners if a home is excavated?”

Response: *A licensed surveyor will be used as needed throughout the cleanup.*

19. **Comment:** “There used to be railcars on the Site. Where did these cars go and what was in the cars? What else is out at the Site besides lead and arsenic?”

Response: *No railcars currently exist on the Site so their former contents cannot be determined. An old rail line did exist across the Site that brought coal in to the Site and that transported coal, slag, and other materials throughout the Site.*

A list of all of the contaminants found at the Site can be found in the Remedial Investigation Report, which is included in the AR for the Site. The contaminants that were determined to be “contaminants of concern” through the risk assessment process were listed in Table 2 of the Proposed Plan and are listed in Table 1 of this ROD. Both the Proposed Plan and this ROD are included in the AR, and copies are available in the local information repository for the Site

20. **Comment:** “Please send sample result letters out to the owners from the previous sampling.”

Response: *EPA sent sample result letters in February 2016 to the owners of all the properties that were tested during the remedial investigation.*

21. **Comment:** “What are the risks for City workers digging in the soil around LaSalle?”

Response: *Risks are low and within EPA’s acceptable risk range for city workers, as represented by the generalized utility and construction worker scenarios evaluated during the human health risk assessment. For utility workers, the risks are 1E-05 and driven by arsenic, and the non-cancer hazard is less than 1. For construction workers, risks are 1E-06 and again driven by arsenic, and the non-cancer hazard is 2.8. There is a potential risk for construction workers due to lead in soil in some locations.*

22. **Comment:** “How can the options to clean up the Site be limited to only six different options? What is the cost of the other options?”

Response: *EPA evaluated significantly more than six cleanup options. During the feasibility study process, EPA initially considered many more options but narrowed them down to a smaller number for a full, detailed evaluation, in accordance with EPA guidance. More details on how the feasibility study was conducted are available in the Feasibility Study Report, which is contained in the AR for the Site. Additionally, Appendix 2 of the Proposed Plan and Appendix 2 of this ROD include brief narrative descriptions of all the various remedial alternatives that were considered.*

23. **Comment:** “What if EPA finds another hot spot of contamination later after the cleanup is completed?”

Response: *EPA does not anticipate this situation happening, since the entire former facility will be remediated and all properties in the Off-Site Residential Area will be tested. However, if additional contamination is found after cleanup is completed, EPA will evaluate the contamination to determine whether it is site-related and whether it poses an unacceptable risk to human health or the environment, and if so, EPA will evaluate appropriate response actions. Additionally, since the remedial action selected by this ROD will leave waste in place at the Site, EPA will conduct a review of the Site remedy every five years after the start of cleanup to determine if anything has changed that would warrant EPA to take additional actions at the Site.*

24. **Comment:** Could contaminants cause MS or cancer in people in the area?

Response: *The human health risk assessment evaluated both cancer risks and non-cancer hazards, and the results of the risk assessment for each different area of the Site are presented in Section 2.6 of this ROD. The results show that there are both cancer risks and non-cancer hazards associated with various exposure scenarios for different areas of the Site. While there are cancer risks and non-cancer hazards associated with the Site, EPA’s risk assessment process does not predict risks and hazards specific to any one adverse health effect, such as MS, or any particular kind of cancer.*

The Agency for Toxic Substances and Disease Registry (ATSDR) completed a Public Health Assessment for the Matthiessen and Hegeler Zinc Company site in 1999, and that document is available (in HTML format only) at <http://www.atsdr.cdc.gov/HAC/pha/PHA.asp?docid=580&pg=0>. For more information about specific adverse health impacts that may be associated with the contaminants that are present and driving the risks at the Site (as described in Section 2.6), individuals may contact ATSDR, located within the EPA Region 5 Chicago office, at 312-886-0840.

25. **Comment:** “How high do lead concentrations have to be before an immediate action is taken?”

Response: *Generally, when lead concentrations in residential soils exceed 1,200 mg/kg, EPA evaluates whether a removal action should be conducted to reduce the risk of exposure. However, lead concentrations exceeding 1,200 mg/kg do not automatically trigger a removal action. A number of factors are taken into consideration to determine if an immediate action is appropriate. These factors include: (1) the amount and quality of the vegetative cover/grass (which can serve as an interim barrier to exposure) and/or the amount of exposed/bare areas of contaminated soil; (2) whether pregnant women or children (particularly children aged 6 or younger) are living at the property and what is known about the children’s blood lead levels, and (3) whether precautionary measures that residents can follow to reduce the likelihood of exposure to the contaminated soil would be effective.*

26. **Comment:** “If an orange barrier is placed at a house because contaminants are found at greater than two feet how would an owner go about adding an addition to a house if it is going to be where the orange barrier is located?”

Response: *If a visual barrier is placed at two feet depth at a property because contamination exists in soils below two feet, some form of institutional control would also be implemented to restrict actions that would disturb the contamination and cause potential exposures. If a home owner wants to excavate below that depth for a home improvement or other reason, the property owner would be responsible for managing the remaining contaminated soil consistent with the requirement of the institutional control.*

COMMENTS FROM THE CITY OF LASALLE

27. **Comment:** “The ROD should state that there is no ‘immediate’ threat to the health of the citizens of LaSalle, the public in general and the local ecology and there is no need to reasonably alarm the public in these circumstances.

“It needs to be clear that the entire city is not a Superfund site. Further it should be emphasized that there should be no impediment to the continued commerce to the city or sale and transfer of real estate within the city similar to what has transpired within the last in excess of 150 years other than potentially with respect to the specific “Superfund site” itself.

“It should be emphasized in the ROD that there is no overall immediate threat to the health of the residents or to the local ecology that groundwater is safe and that the Little Vermilion River will need no remediation based on USEPA’s investigations.

“It should be emphasized that home-grown produce can still be safely eaten and grown and that it is safe for children to play outside within the residential area.

“It is requested that the residential area be tested as soon as possible. It is requested that if any homeowner would like to sell their home, that they may ask USEPA to test their residence immediately and if contamination is found, it be immediately remediated. It has been suggested that the cleanup process could take 10-20 years. We request that this process be more expeditious.”

Response: *The risk assessment conducted for the different areas of the Site show that there are risks to human health that need to be addressed, but they do not constitute an emergency situation or an immediate threat. Rather, the risks are based on exposure scenarios that assume many years of exposure, and the risks are expressed in terms of “excess lifetime cancer risks” because they are in addition to (and much smaller than) the risk of cancer individuals face from other causes, which has been estimated to be as high as one in three. The risks that are posed by the Site will be addressed by the remedial action selected in this ROD.*

Superfund sites are defined by where the contamination has come to be located. Clearly the entire city is not a Superfund site. While all the residential properties will need to be tested during the remedial design, until that testing is conducted EPA will not know which ones need to be cleaned up.

As noted earlier in the ROD, EPA is not selecting a remedy for groundwater at the Site, nor does the Little Vermilion River require cleanup. Groundwater at the Site is not used as a source of drinking water and has been classified as Class II (non-potable) water by the State. There is no reason to question the quality of the drinking water supply provided to residents by the city, because the water supply wells are either cross-gradient/up-gradient from the Site or sufficiently distant from the Site so as not to be impacted by the Site.

As noted in response to Comment #1, EPA has not identified an actionable risk associated with ingestion of homegrown produce based on currently-available data, but EPA will continue to evaluate the data as more properties are tested during the remedial design phase. See response to Comment #1 for precautionary steps that residents can take to reduce potential exposures from consumption of home-grown produce.

EPA has not yet tested the majority of the properties in the Off-Site Residential Area. In the absence of property-specific data, there are a number of common-sense steps that residents can take to reduce their family's exposures to potentially-contaminated soil, such as:

- not letting children play in bare dirt*
- washing children's hands and feet after they have been playing outside*
- washing children's toys and babies' pacifiers regularly*
- wearing gloves and not eating, chewing gum, or smoking when working in the yard*
- damp-mopping floors and damp-mopping counters and furniture regularly*

EPA will provide informational and educational materials to residents as the cleanup project progresses.

EPA will initiate the remedial design phase after issuing the ROD, and will begin sampling properties in the Off-Site Residential Area as the first priority. EPA plans to begin the testing in areas closest to the former smelting facility, as those properties are more likely to have soil contamination – due to their proximity to the facility – than properties further away from the facility. EPA wants to complete the testing and cleanup work as quickly as possible, but due to funding constraints and the large number of properties to be addressed, the work will be conducted over a number of years, as at other large residential cleanup projects. While the most efficient and cost-effective way to do the testing and cleanup work is in a methodical, neighborhood-by-neighborhood fashion, EPA understands that there may be compelling reasons for occasionally deviating from this approach and addressing certain properties earlier than they otherwise would be addressed. EPA will try to build some flexibility into its process to allow some deviation from its planned approach, to the extent practicable.

COMMENTS FROM POTENTIALLY RESPONSIBLE PARTIES

28. Comment from Carus Corporation: “The proposed alternative for the North Area is not warranted for this part of the Site based on the results of the XRF data, because there is no unacceptable human health and ecological risks, and because the future use scenario of this part of the Site should not be deemed commercial industrial. EPA guidance does allow the selection of an IC-only remedy and that is what have should been selected for the North Area.”

Response: *The risk assessment for the Site indicates that there is a basis for action at the North Area based on anticipated commercial/industrial land use and a construction worker scenario. EPA currently considers this to be the reasonably anticipated future land use for the North Area. EPA understands that Carus Corporation is working to possibly transfer parcels it owns in the North Area to natural resource trustees as part of a potential natural resource damage settlement. If this occurs, EPA understands that the land would be used as an ecological corridor EPA would consider at that time changing the future land use of those specific parcels of land, and, if appropriate based on the new land use, changing the Selected Remedy. Until the parcels are transferred, however, EPA considers commercial/industrial to be the appropriate future land use for this area of the Site.*

29. Comment from Carus Corporation: “The Proposed Plan incorrectly states that Carus purchased the slag pile after the majority of the slag had been placed there.”

Response: *EPA agrees that the whole of the slag pile was placed on the land prior to Carus purchasing the property. The incorrect statement noted in the comment is not included in the ROD*

30. Comment from Carus Corporation: “The Proposed Plan incorrectly describes the maximum concentrations of zinc and lead in surface water for the Little Vermilion River.”

Response: *EPA agrees that the results reported in the Proposed Plan are from the abandoned sewer overflow prior to its entering the Little Vermilion River. The ROD correctly states the results for the Little Vermilion River.*

31. Comment from RPS GaiaTech (on behalf of Fred Carus): RPS GaiaTech (RPS) submitted a lengthy comment letter to EPA on the Proposed Plan. The comment letter is included in the AR and is not re-stated here. The letter contained four main comments, three of which proposed alternative remedial strategies for (1) the Building 100 Area, the Rolling Mill Area, and the Main Industrial Area, (2) the on-site soil consolidation area, and (3) the North Area. The fourth comment provided information supporting the consideration of other potential contaminant source areas in the vicinity of the Site.

Response: *EPA is aware of the phytostabilization soil cap used at the Palmerton Zinc site that is referenced in the comment letter. Similar approaches were considered in the*

development of remedial strategies during the FS, but were not carried forward as an appropriate remedial technology for the Matthiessen and Hegeler Zinc Company Site cleanup.

EPA follows CERCLA guidance by developing RAOs, overlaying General Response Actions (such as containment, treatment, and excavation), identifying remedial technologies and representative process options, and, finally, screening on the basis of effectiveness, implementability, and relative cost. By following the CERCLA process, EPA develops a range of remedial alternatives. In the case of the Matthiessen and Hegeler Zinc site, the Selected Remedy includes demolition of structures, waste consolidation, and containment Treatment through chemical stabilization of excavated hazardous wastes is also part of the Selected Remedy.

The limitations of implementing vegetative stabilization in OU2 include:

- A thin (6-inch) soil layer does not impede infiltration and leaching of contaminants to groundwater;*
- There is little indication of plant action to adsorb or bind metals in the subsurface to limit or reduce available metals to leaching mechanisms,*
- A 6-inch amended soil layer limits root growth and plant fixation;*
- If plants are observed to uptake metals, vegetation will require maintenance, including “harvesting” and disposal Therefore, costs associated with long-term maintenance in this scenario exceed the estimate of maintaining a consolidation cell;*
- Initial savings in a vegetative soil cover remedy are outweighed by continued risk of erosion and potential contact with metals by risk receptors; and*
- Vegetative covers are typically more effective in addressing arsenic contamination than the full suite of contaminants found at the Site.*

The Selected Remedy addresses numerous considerations at the Site, mainly multiple source areas containing variations in contaminants (metals, VOCs, SVOCs, asbestos, and PCBs) The Selected Remedy consolidates contaminants, reduces the footprint of contamination substantially, and increases the available land for commercial/industrial reuse Further, demolition debris from structures at the Site will be recycled to the extent possible, or managed in the proposed consolidation cell, thereby eliminating this waste stream from off-site disposal consideration and associated costs. The suggested remedial alternative of placing excavated material in a topographic low at the Site does not provide for this type of waste materials handling.

EPA agrees that heavy metals identified in the LaSalle-Peru area may not be attributable to a single point source EPA will sample the residential area during the remedial design, starting with residences closest to the former smelting facility. If there appears to be a tapering off of contamination as sampling moves away from the facility, a decision may then be made identifying a boundary for the Site-related contamination in the Off-Site Residential Area. However, currently there is no known demarcation regarding contamination related to zinc manufacturing in the LaSalle-Peru area. EPA’s objective is

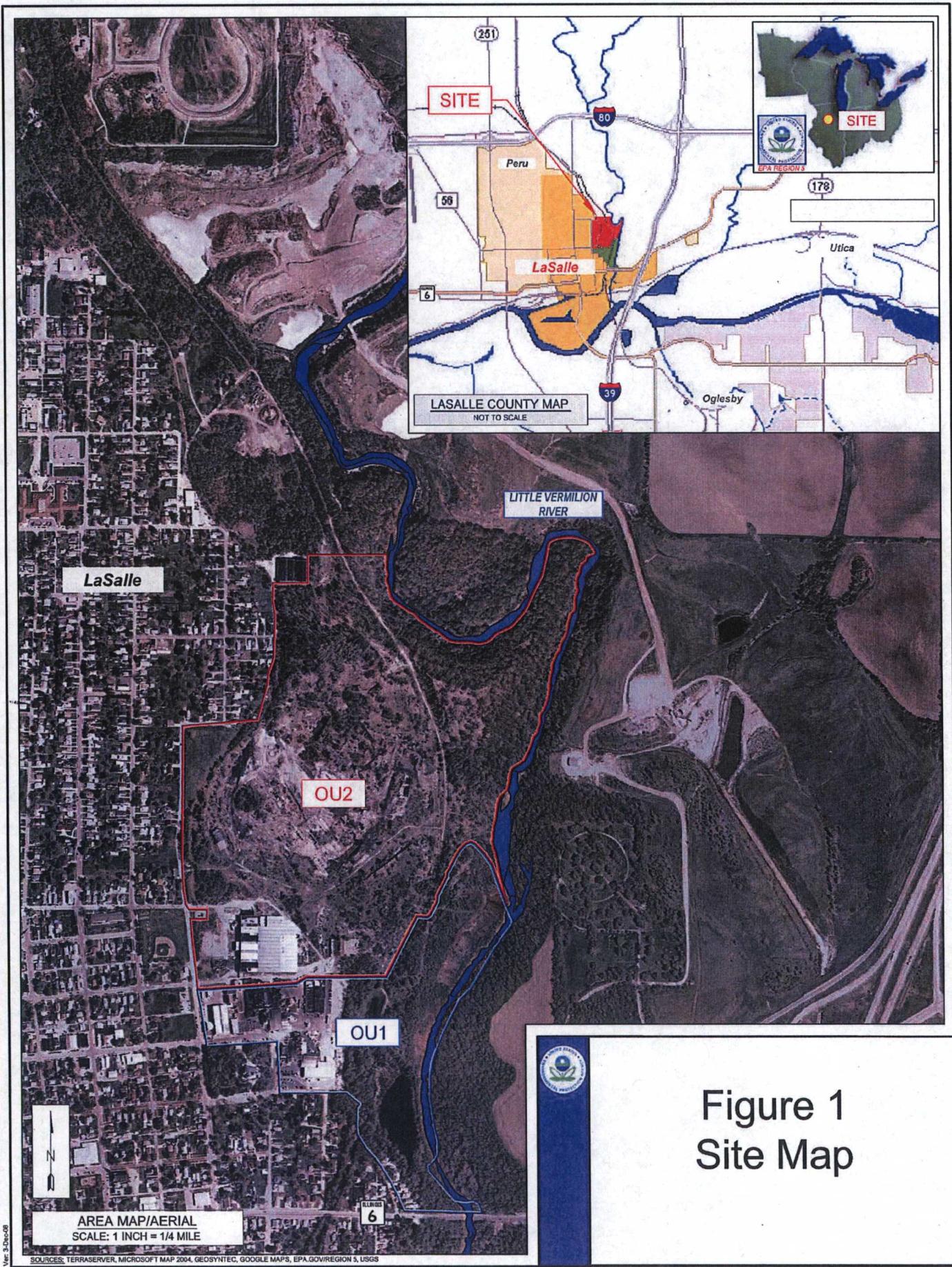
to use best professional judgement and clean up areas that have been contaminated by the Matthiessen and Hegeler Zinc facility

EPA presented information in the RI report indicating a prevailing westerly wind direction in the LaSalle-Peru area. Nonetheless, wind patterns from the east/northeast towards the west/southwest are documented during annual periods in this area. Therefore, it is reasonable to expect that a fraction of the heavy metals observed in the residential area is attributable to Matthiessen and Hegeler Zinc operations. Data indicate a contaminant gradient is present from east (nearer the facility) with gradually reduced concentrations observed toward the west/southwest into the residential area (away from the facility).

Despite the presence of a large slag pile at the Matthiessen and Hegeler Zinc Site and the alleged lack of slag pile at the Illinois Zinc facility discussed in the RPS comment letter, little to no information is available regarding the use of slag from either facility as fill material locally.

EPA acknowledges various anthropogenic sources of localized contamination at Superfund sites located in industrial areas. Data provided in the RPS comment letter summarizes national/regional trends and does not provide specific information about anthropogenic heavy metal contamination in the LaSalle-Peru area or the Off-Site Residential Area of the Site. EPA collected site-specific background samples during the RI process, showing slightly higher localized background metals concentrations compared to default Illinois background concentrations. For example, sampling during the RI showed that site-specific background concentrations of lead in soil were 11.3 mg/kg, compared to the Illinois state-wide average concentration of 10.8 mg/kg.

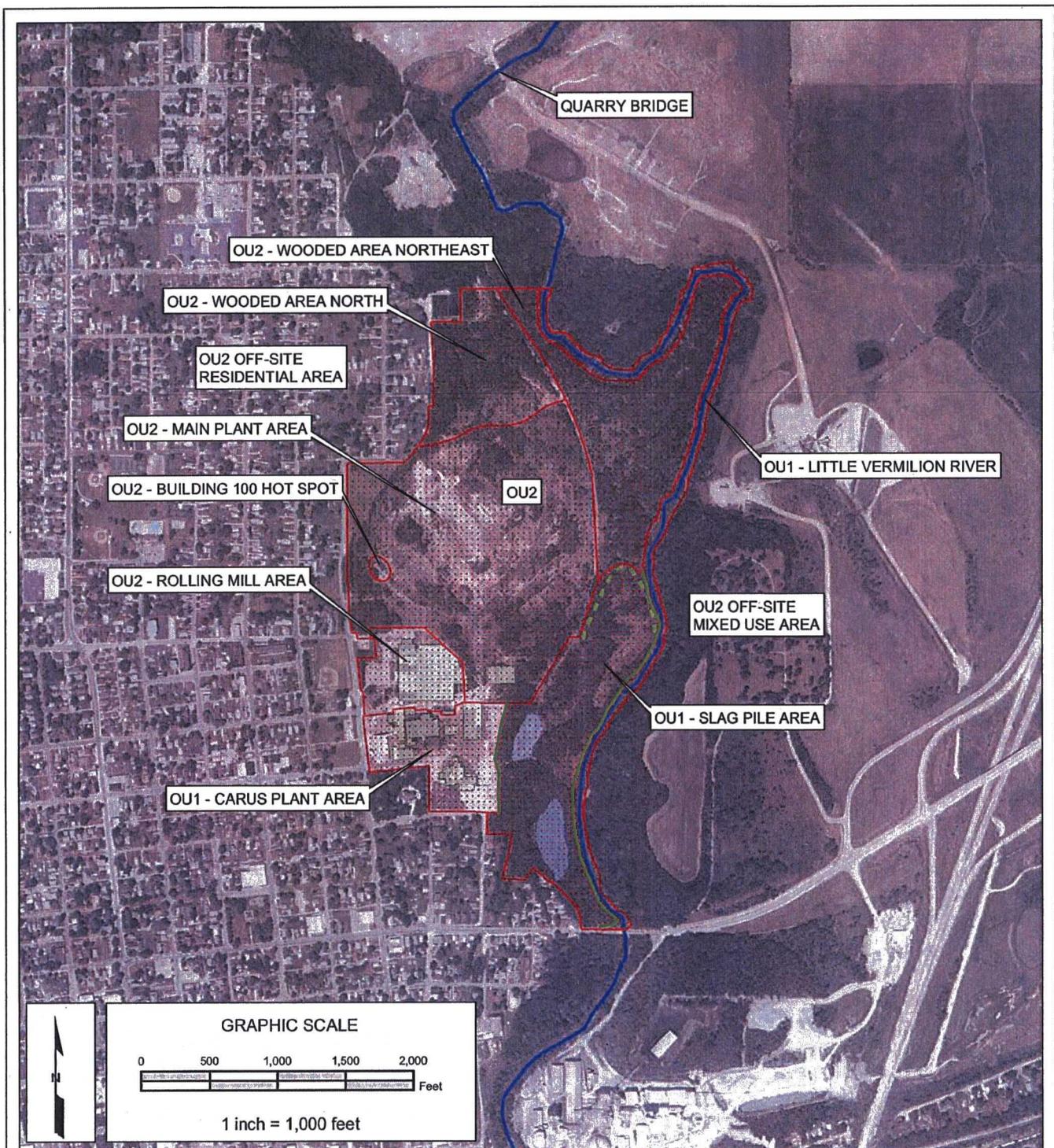
FIGURES



**Figure 1
Site Map**

Ver: 3-Dec-08

SOURCES: TERRASERVER, MICROSOFT MAP 2004, GEOSYNTEC, GOOGLE MAPS, EPA.GOV/REGION 3, USGS



OU Boundaries
 Little Vermilion River
 Approximate Northern Boundary of Slag Pile
 Site Buildings
 NPDES Non-Contact Cooling Water Ponds

Basemap Source:
 USDA NAIP, 2007

Figure 2
Site
Layout
Map

N:\C:\m\0509722_HRA_Data_Scenes\Figure2



- OU Boundaries
- Approximate Highly Disturbed Boundary
- Approximate Disturbed with Vegetation Boundary
- NPDES Non-Contact Cooling Water Ponds
- Riparian Habitat
- Little Vermilion River
- OU1 Exposure Area Boundaries

Figure 3
OU1
Exposure Areas
and
Habitat Map

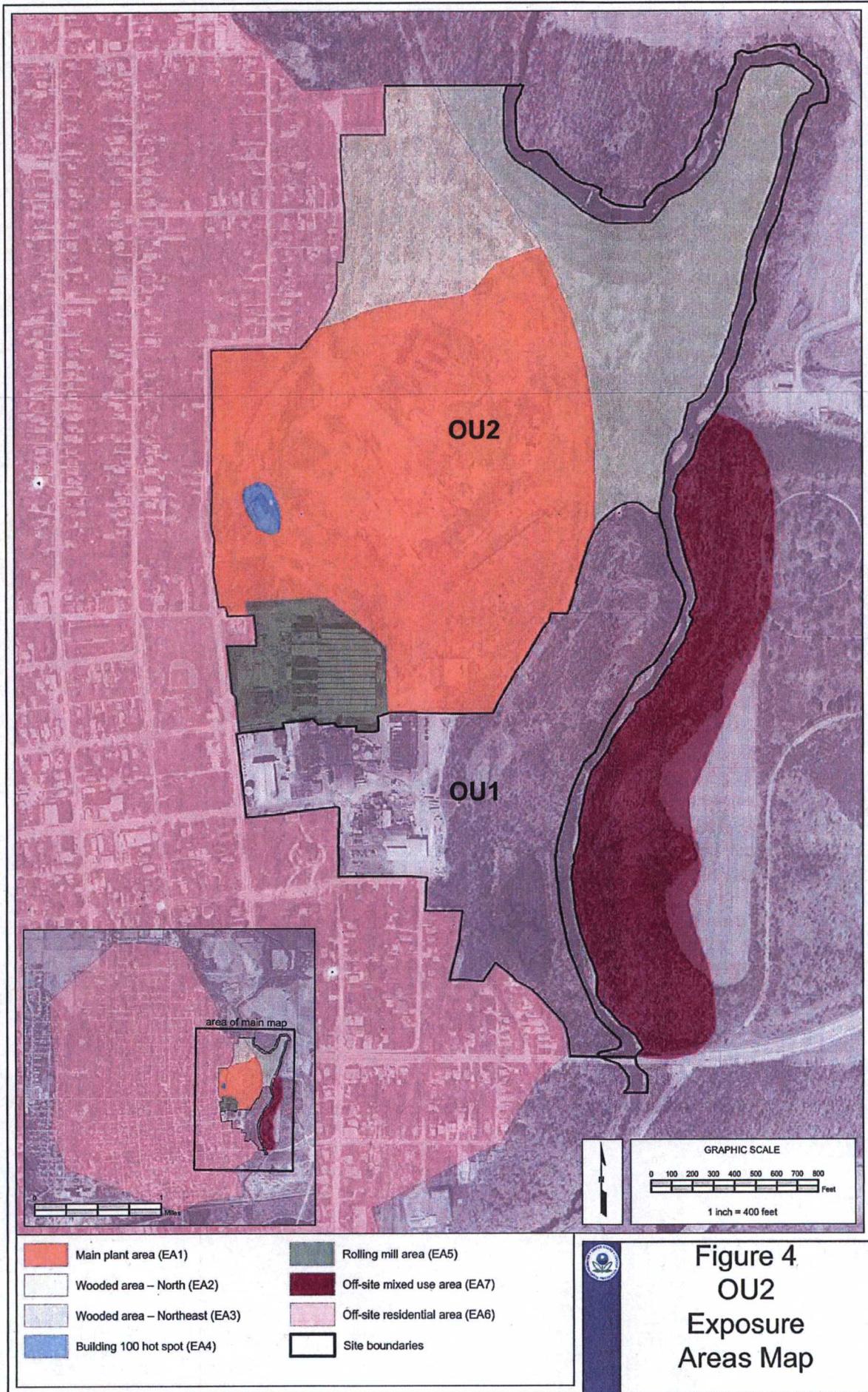


Figure 4
OU2
Exposure
Areas Map

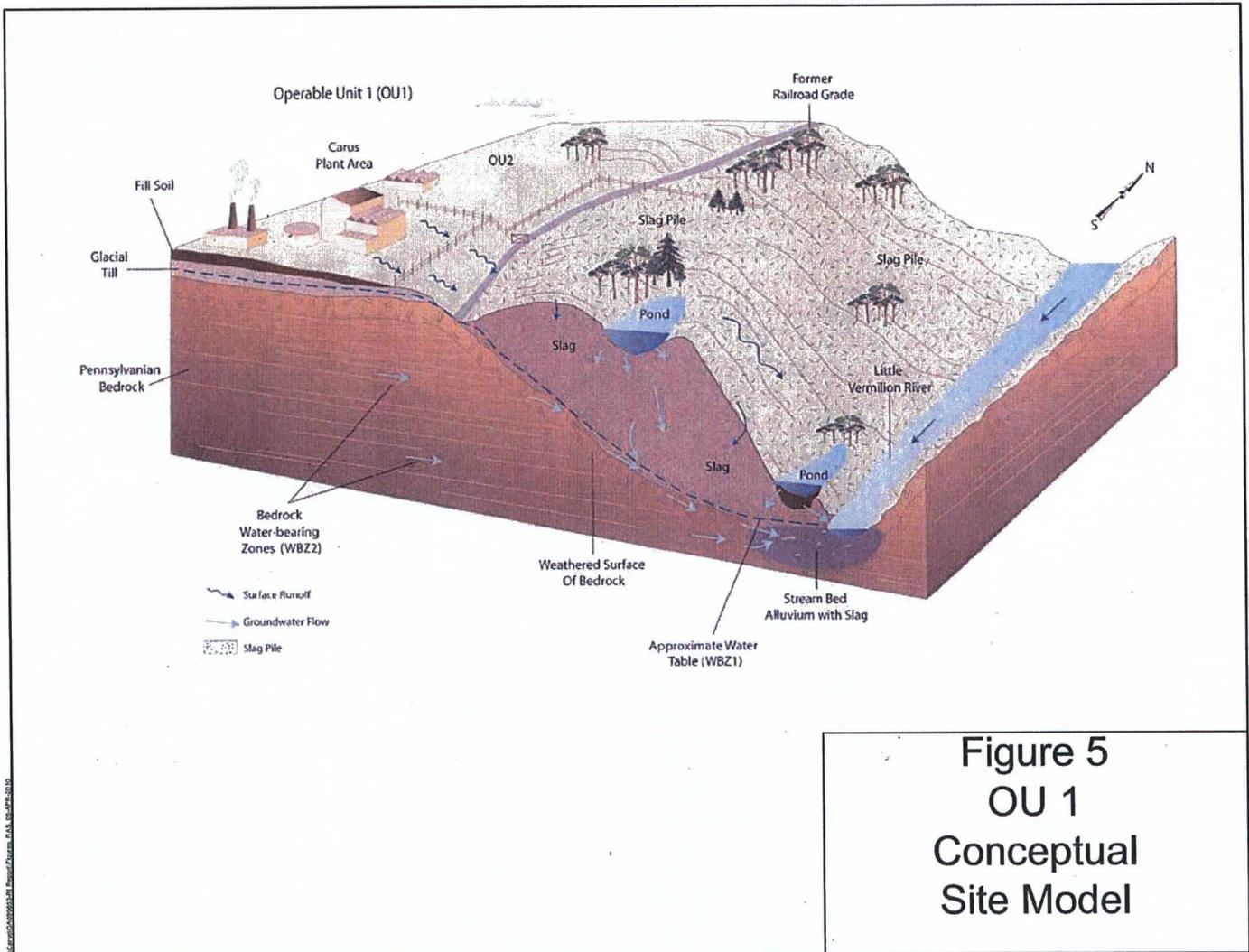


Figure 5
OU 1
Conceptual
Site Model

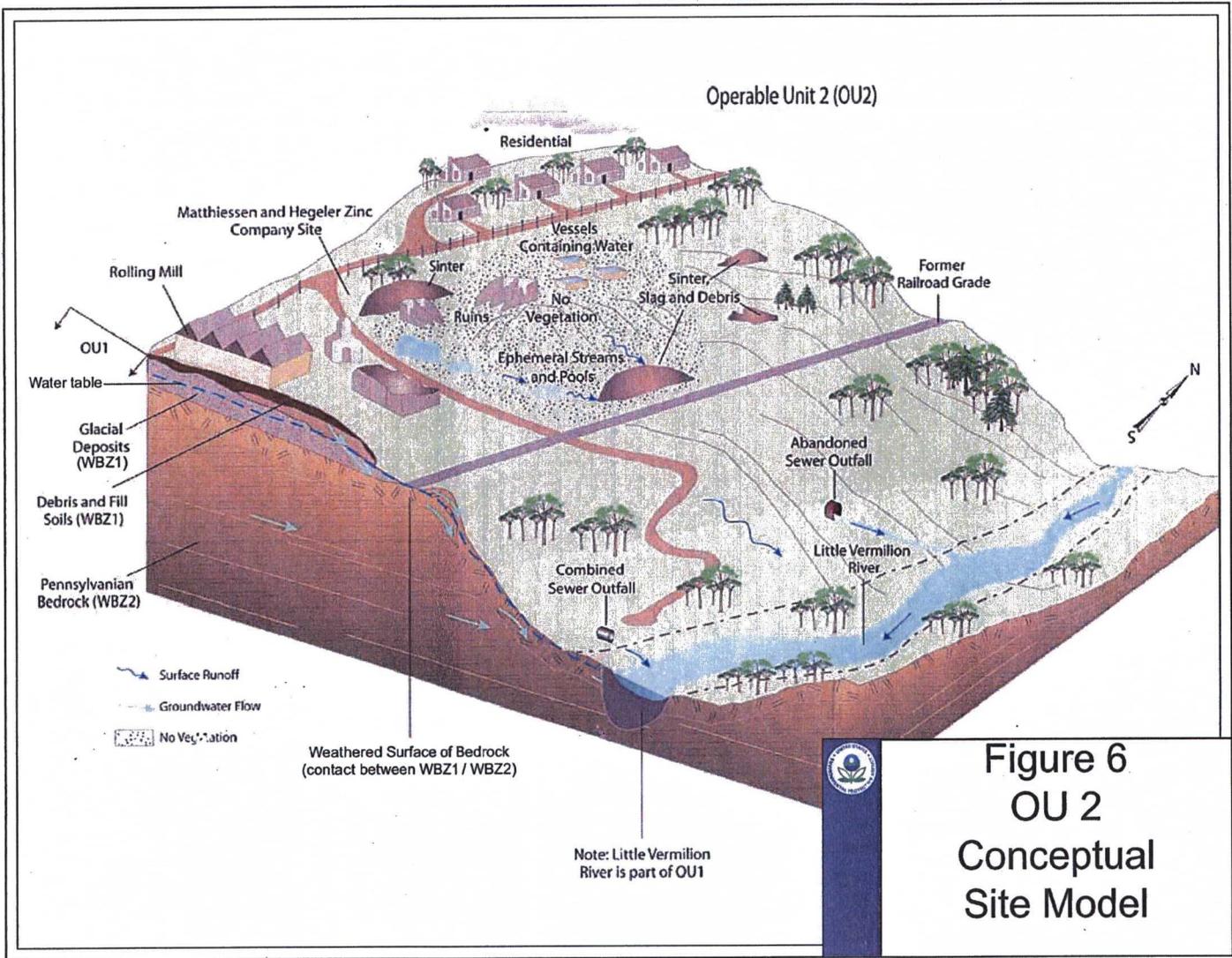
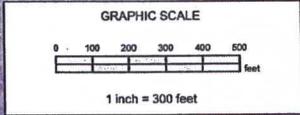


Figure 6
OU 2
Conceptual
Site Model



- Main plant area - highly disturbed (little or no vegetation)
- Adjacent to the main plant - disturbed with vegetation (woodland-grassland)
- Savannah
- Oak-hickory woodland

BERA = Baseline Ecological Risk Assessment



Figure 7
OU 2
Habitat
Map

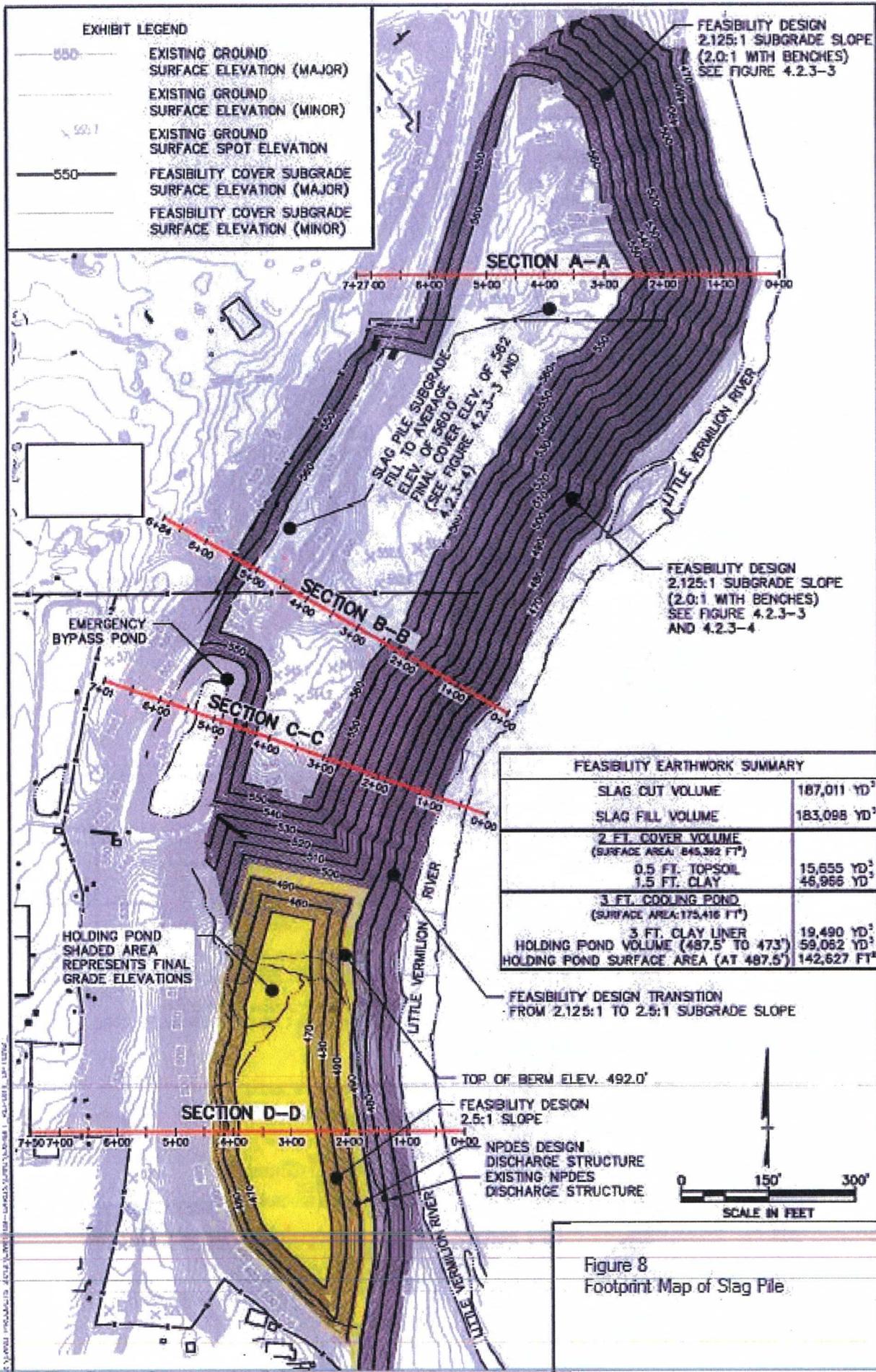
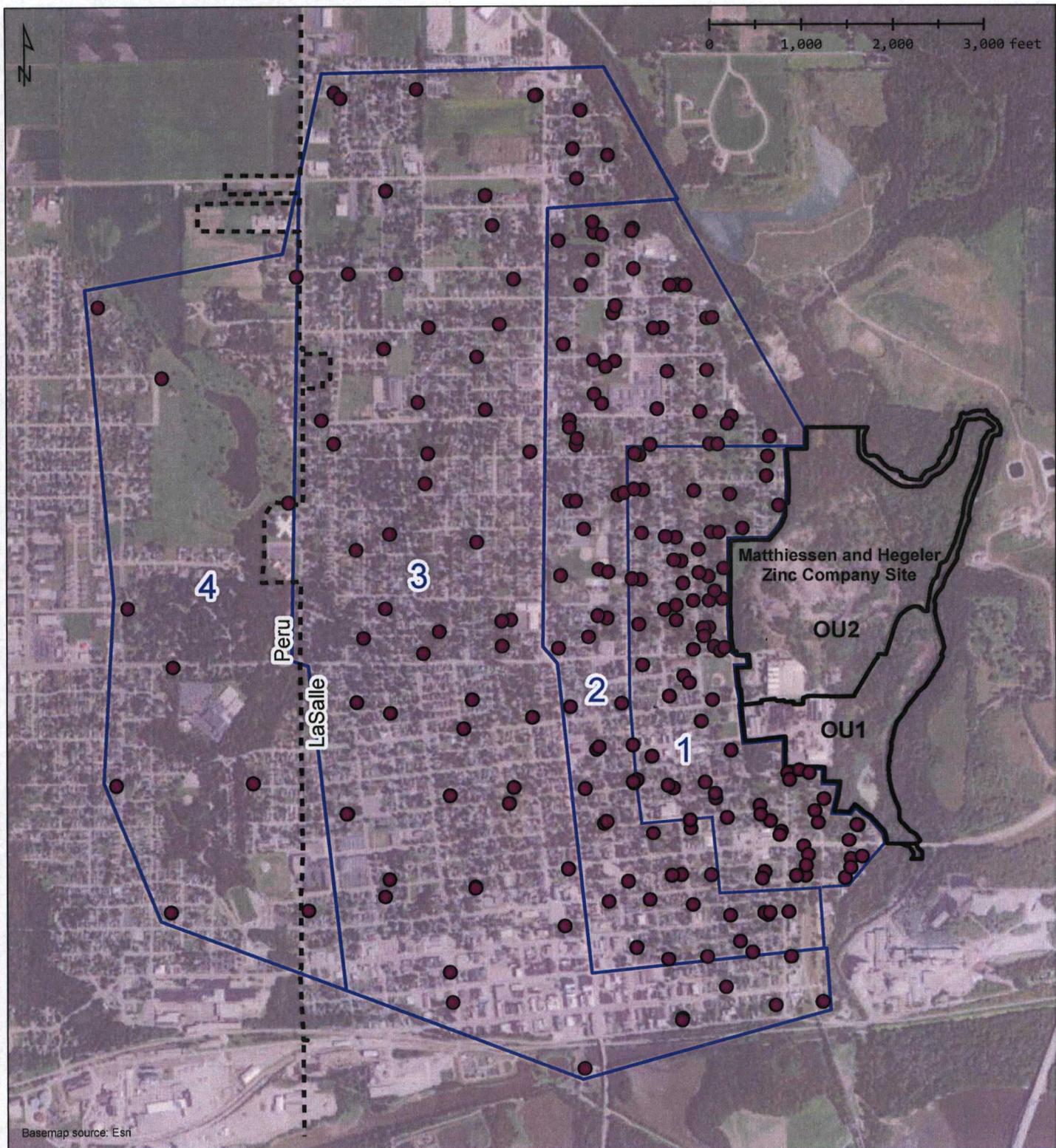


Figure 8
Footprint Map of Slag Pile



Basemap source: Esri

- Residential sample location
- 2 Residential zone
- - - City boundary
- Site boundary



MATTHIESSEN AND HEGELER ZINC COMPANY SITE
OPERABLE UNIT 2, LASALLE COUNTY, ILLINOIS

FIGURE 9
OFF-SITE RESIDENTIAL AREA
SAMPLING LOCATIONS

EPA REGION 5 RAC 2 | REVISION 0 | SEPTEMBER 2016



TABLES

Table 1
Contaminants of Concern

Table 1
Contaminants of Concern for OU1

Exposure Area	Exposure Scenario	Exposure Medium	Chemical of Concern
OU1 PLANT AREA	CURRENT COMMERCIAL/ INDUSTRIAL WORKER	Surface Soil	Arsenic
			Chromium (5)
			Manganese
			Mercury (5)
			Aroclor 1254
			Aroclor 1260
	Benzo(a)pyrene		
	FUTURE COMMERCIAL/ INDUSTRIAL WORKER	Subsurface Soil	Arsenic
			Chromium
			Manganese
			Aroclor 1254
			Aroclor 1260
	Benzo(a)pyrene		
	CURRENT AND FUTURE UTILITY WORKER	Subsurface Soil	Arsenic
			Manganese
	FUTURE CONSTRUCTION WORKER	Subsurface Soil	Lead (7)
			Manganese
			Mercury (6)
	HYPOTHETICAL FUTURE RESIDENT	Surface Soil	Aluminum
			Antimony
			Arsenic
			Cadmium
			Chromium (5)
			Cobalt
			Copper
			Iron
			Lead (7)
			Manganese
Mercury (6)			
Vanadium			
Zinc			
Aroclor 1254			
Aroclor 1260			
Benzo(a)anthracene			
Benzo(a)pyrene			
Benzo(b)fluoranthene			
Benzo(k)fluoranthene			
Dibenz(a,h)anthracene			
Indeno(1,2,3-cd)pyrene			
Subsurface Soil	Aluminum		
	Antimony		
	Arsenic		
	Cadmium		
	Chromium (5)		
	Cobalt		
	Copper		
	Iron		
	Lead (7)		
	Manganese		
Mercury (6)			
Vanadium			
Zinc			
Aroclor 1254			
Aroclor 1260			
Benzo(a)anthracene			
Benzo(a)pyrene			
Benzo(b)fluoranthene			
Benzo(k)fluoranthene			
Dibenz(a,h)anthracene			
Indeno(1,2,3-cd)pyrene			

Exposure Area	Exposure Scenario	Exposure Medium	Chemical of Concern
OU1 SLAG PILE AREA	FUTURE COMMERCIAL/ INDUSTRIAL WORKER	Surface Soil	Arsenic
			Cobalt
			Lead (7)
			Manganese
			Mercury (8)
		Zinc	
		Hexachlorobenzene	
		Subsurface Soil	Arsenic
			Cobalt
			Lead (7)
	Manganese		
	Mercury (8)		
	Zinc		
	Benzo(a)pyrene		
	Hexachlorobenzene		
	CURRENT AND FUTURE SITE-SPECIFIC WORKER	Surface Soil	Arsenic
		Subsurface Soil	Arsenic
	CURRENT AND FUTURE UTILITY WORKER	Surface Soil	Arsenic
		Subsurface Soil	Arsenic
	FUTURE CONSTRUCTION WORKER	Subsurface Soil	Lead (7)
Manganese			
Hexachlorobenzene			
Aluminum			
Antimony			
Arsenic			
Barium			
Cadmium			
Cobalt			
Copper			
Iron			
Lead (7)			
Manganese			
Mercury (8)			
Vanadium			
Zinc			
CURRENT TRESPASSER - ADOLESCENT	Surface Soil	None	
CURRENT TRESPASSER - ADULT	Surface Soil	Arsenic	
FUTURE RECREATIONALIST - CHILD	Subsurface Soil	Arsenic	
FUTURE RECREATIONALIST - ADOLESCENT	Subsurface Soil	None	
FUTURE RECREATIONALIST - ADULT	Subsurface Soil	Arsenic	

Notes

1 Risk-Based Remedial Action Level (RAL) is the minimum of the cancer (CA) and non-cancer (NC) RAL calculated as follows

a) $RAL_{CA} = EPC \times (TCR / \text{Calculated Risk})$

b) $RAL_{NC} = EPC \times (THQ / \text{Calculated HQ})$

where

EPC = Exposure Point Concentration

TCR = Target Cancer Risk

THQ = Target Hazard Quotient

HQ = Hazard Quotient

c) Or, for lead, the RAL is the receptor-specific preliminary remediation goals (PRGs) calculated in Appendix RA-4 of the RI Report using the Integrated Exposure Uptake Biokinetic (IEUBK) Model or the Adult Lead Model (ALM).

2 Laboratory analytical goal limit (PQL) is TBD

3 Site-specific background threshold value (BTW) developed as described in Appendix RA-2 of the RI

4 Human Health RAL is selected as the maximum of the BTW, PQL, or risk-based RAL

5 BTW, PQL, and risk-based RAL are for total chromium concentrations. In the HHRA, total chromium was evaluated assuming a 1:6 hexavalent-to-trivalent ratio and utilizing the species-specific toxicity values. Only hexavalent chromium was identified as a COC. The total chromium risk-based RAL presented in the table was calculated by multiplying the hexavalent chromium risk-based RAL by 7.

6 In the HHRA, mercury was evaluated assuming the most toxic form for a given exposure pathway. Toxicity values for inorganic mercury species were used to evaluate ingestion and dermal contact pathways where as toxicity values for elemental mercury were used to evaluate inhalation pathways. This approach inherently assumes that mercury is simultaneously present in both forms and, therefore, overestimates risk. Thus, the RALs are also conservatively biased.

Table I
Contaminants of Concern for OU2

Investigation Area	Exposure Area	Exposure Medium	Chemical of Concern
IA 3- Former Main Industrial (MIA) Area	Main Plant Area	Surface Soil	Antimony
			Aroclor-1248
			Aroclor-1260
			Arsenic
			Asbestos
			Benzo(a)anthracene
			Benzo(a)pyrene
			Benzo(b)fluoranthene
			Cadmium
			Chromium, hexavalent
			Cobalt
			Dibenzo(a,h)anthracene
			Indeno(1,2,3-cd)pyrene
			Lead
		Manganese	
		Mercury	
		Thallium	
		Zinc	
		Subsurface Soil	Antimony
			Aroclor-1248
			Aroclor-1260
			Arsenic
			Benzo(a)anthracene
			Benzo(a)pyrene
			Benzo(b)fluoranthene
			Cadmium
Chromium, hexavalent			
Cobalt			
Dibenzo(a,h)anthracene			
Indeno(1,2,3-cd)pyrene			
Lead			
Manganese			
Mercury			
Thallium			
Zinc			

Table 1
 Contaminants of Concern for OU2

Investigation Area	Exposure Area	Exposure Medium	Chemical of Concern
IA 4 - North (N) Area	Wooded Area North	Surface Soil	Antimony
			Arsenic
			Benzo(a)anthracene
			Benzo(a)pyrene
			Benzo(b)fluoranthene
			Cadmium
			Chromium, hexavalent
			Copper
			Lead
		Manganese	
		Zinc	
		Subsurface Soil	Antimony
			Arsenic
			Benzo(a)anthracene
			Benzo(a)pyrene
			Benzo(b)fluoranthene
			Cadmium
			Chromium, hexavalent
			Copper
Manganese			
Zinc			
IA 1 - Building 100 (B100) Area	Building 100	Surface Soil	Aroclor-1260
			Arsenic
			Asbestos
			Benzo(a)pyrene
			Dibenzo(a,h)anthracene
			Lead
			Manganese
		Thallium	
		Subsurface Soil	Aroclor-1260
			Arsenic
			Benzo(a)pyrene
			Dibenzo(a,h)anthracene
			Lead
			Manganese
Thallium			

Table 1
Contaminants of Concern for OU2

Investigation Area	Exposure Area	Exposure Medium	Chemical of Concern
IA 2 - Rolling Mill (RM) Area	Rolling Mill Area	Surface Soil	Aroclor-1248
			Arsenic
			Asbestos
			Benzo(a)anthracene
			Benzo(a)pyrene
			Benzo(b)fluoranthene
			Copper
			Cyanide
			Dibenzo(a,h)anthracene
			Indeno(1,2,3-cd)pyrene
		Subsurface Soil	Lead
			Trichloroethene
			Zinc
			Aroclor-1248
			Arsenic
			Benzo(a)anthracene
			Benzo(a)pyrene
			Benzo(b)fluoranthene
			Copper
			Cyanide
IA 5 - Residential (RES) Area	Off-Site Residential Area	Surface Soil	Dibenzo(a,h)anthracene
			Indeno(1,2,3-cd)pyrene
			Lead
			Trichloroethene
			Zinc
		Subsurface Soil	Arsenic
			Lead

Notes

1 Surface soil represents 0-2 ft bgs interval. Subsurface soil represents 2-10 ft bgs interval.

2 PQL is based on Contract Laboratory Program's (CLP) Contract Required Quantitation Limits (CRQL) except for Hexavalent Chromium, which is based on SW-846 Method 7196.

Table 2

Summary of Preliminary Remediation Goals and Final Cleanup Levels

Table 2
Summary of Preliminary Remediation Goals and Final Cleanup Levels

PRGs for On-Site Soil (all areas except Off-Site Residential Area)		
COC	PRG ¹ (mg/kg)	Basis
Antimony	118.8	RBC
Arochlor-1248	4.2	RBC
Arochlor-1260	4.2	RBC
Arsenic	37.0	RBC
Asbestos ³	TBD	TBD
Benzo(a)anthracene	21.1	RBC
Benzo(a)pyrene	2.1	RBC
Benzo(b)fluoranthene	21.1	RBC
Cadmium	263.9	RBC
Chromium (hexavalent) ⁴	214.9	RBC
Cobalt	88.6	RBC
Copper	11,879	RBC
Cyanide	3.0	RBC
Dibenzo(a,h)anthracene	2.1	RBC
Indeno(1,2,3-cd)pyrene	21.1	RBC
Lead	800	RSL
Manganese	6,778	RBC
Mercury	4.8	RBC
Thallium	3.2	BTV
Trichloroethene	3.2	RBC
Zinc	89,091	RBC

PRGs for Off-Site Residential Area Soil		
COC	PRG ² (mg/kg)	Basis
Arsenic	18.0	RBC
Cadmium	6.4	RBC
Chromium (hexavalent)	1.0	PQL
Lead	400	RSL
Manganese	1,056	BTV
Zinc	1,379	RBC

Notes.

- mg/kg milligram per kilogram
- BTV Background Threshold Value
- PRG Preliminary Remediation Goal
- PQL Practical Quantitation Limit
- RBC Risk-Based Concentration
- RSL EPA Regional Screening Level
- TBD To Be Determined

¹ On-site commercial/industrial PRGs are based on the lower of 1E-05 or HI = 1 for the most conservative exposure scenario evaluated in the risk assessment

² Off-site residential PRGs are based on the lower of 1E-06 or HI = 1 for the most conservative exposure scenario evaluated in the risk assessment (except for arsenic which is based on the lower of 1E-04 or HI = 1)

³ The FS Report assumed the PRG for asbestos would be 1% in soil, TBD during remedial design

⁴ The risk assessment and FS Report assumed that hexavalent chromium was present as a percentage of total chromium. Additional investigation is needed during the remedial design phase to determine if hexavalent chromium is present and should be retained as a COC

Table 2
Summary of Preliminary Remediation Goals and Final Cleanup Levels

Final Cleanup Levels for On-Site Soil (all areas except Off-Site Residential Area)		
COC	Final Cleanup Level (mg/kg unless otherwise noted)	Basis
Antimony	118.8	RBC
Arochlor-1248	4.2	RBC
Arochlor-1260	4.2	RBC
Arsenic	37.0	RBC
Asbestos	1%	EPA Guidance
Benzo(a)anthracene	21.1	RBC
Benzo(a)pyrene	2.1	RBC
Benzo(b)fluoranthene	21.1	RBC
Cadmium	263.9	RBC
Chromium (hexavalent) ¹	214.9	RBC
Cobalt	88.6	RBC
Copper	11,879	RBC
Cyanide	3.0	RBC
Dibenzo(a,h)anthracene	2.1	RBC
Indeno(1,2,3-cd)pyrene	21.1	RBC
Lead*	800*	RSL
Manganese	6,778	RBC
Mercury	4.8	RBC
Thallium	3.2	BTV
Trichloroethene	3.2	RBC
Zinc	89,091	RBC

Final Cleanup Levels for Off-Site Residential Area Soil		
COC	Final Cleanup Level (mg/kg)	Basis
Arsenic	18.0	RBC
Cadmium	6.4	RBC
Chromium (hexavalent)	1.0	PQL
Lead*	400*	RSL
Manganese	1,056	BTV
Zinc	1,379	RBC

Notes

- mg/kg milligram per kilogram
- BTV Background Threshold Value
- PQL Practical Quantitation Limit
- RBC Risk-Based Concentration
- RSL EPA Regional Screening Level

¹ The risk assessment and FS Report assumed that hexavalent chromium was present as a percentage of total chromium. Additional investigation is needed during the remedial design phase to determine if hexavalent chromium is present and should be retained as a COC.

* The lead values above are interim cleanup levels. EPA will re-evaluate the lead cleanup levels in light of OLEM Directive 9200.2-167, dated December 22, 2016, and will address any revisions to the cleanup levels in an appropriate decision document.

Table 3

Applicable or Relevant and Appropriate Requirements

TABLE 3

**Applicable or Relevant and Appropriate Requirements
Matthiessen & Hegeler Zinc Company Site**

Action	Requirements	Prerequisite	Citation(s)
<i>ARARs</i>			
Water quality criteria	Establishes water quality criteria for specific pollutants for the protection of human health and aquatic life. These federal water quality criteria are non-enforceable guidelines used by the state to set water quality standards for surface water	Water quality criteria are TBCs used in assessing impacts to surface water and in setting NPDES standards for discharges to surface water, such as point source discharges from sediment dewatering. Technically not applicable to ephemeral streams or drainage ways – to be considered	Federal Water Pollution Control Act as amended by the Clean Water Act (CWA) of 1977, Section 208(b), Section 303, Section 304(a)(1) 40 CFR Part 131-Water Quality Standards
Conservation	Requires federal agencies to utilize their statutory and administrative authority to conserve and promote conservation of non-game fish and wildlife species.	The Act is considered a potential ARAR for construction activities performed during the implementation of remedies that may affect drainageways, streams, ponds, and wetlands – to be considered	Fish and Wildlife Conservation Act (16 USC 2901-2912)
PCB materials	Provides regulations for storage, handling and disposal of materials containing PCBs greater than 50 ppm	Applies to remedies involving excavation – relevant and appropriate	Toxic Substance Control Act 40 CFR Part 761
Discovery of endangered or threatened species	Requires federal agencies to assure that the continued existence of any endangered or threatened species and their habitats will not be jeopardized by a site action	Applies to any action taken at the site – relevant and appropriate	Endangered Species Act 16 USC 1531 et seq. 50 CFR Part 200 50 CFR Part 402
Abandoned Mined Lands and Water Reclamation Act	Provide for the conservation and reclamation of lands and water affected by mining which have been abandoned, in order to restore these abandoned lands and waters to such productive use, in accordance with this State's conservation and land reclamation policies	The purpose of this Act is to implement these policies in a way which satisfies the requirements of the federal Surface Mining Control and Reclamation Act of 1977, P. L. 95-87, as amended, and which makes this State eligible for funds for reclamation of abandoned lands and waters under that Act - relevant and appropriate	20 ILCS 1920

Action	Requirements	Prerequisite	Citation(s)
<i>Waste Characterization under the Resource Conservation and Recovery Act (RCRA)</i>			
Characterization of <i>solid waste</i> (all primary and secondary wastes)	<p>Must determine if solid waste is a hazardous waste using the following method:</p> <ul style="list-style-type: none"> • Should first determine if waste is excluded from regulation under 40 C.F.R. § 261.4; and • Must then determine if waste is listed as a hazardous waste under subpart D 40 C.F.R. § Part 261. 	Generation of solid waste as defined in 40 C.F.R. § 261.2 – applicable	40 C.F.R. § 262.11(a) and (b)
	<p>Must determine whether the waste is (characteristic waste) identified in subpart C of 40 C.F.R. § Part 261 by either:</p> <p>(1) Testing the waste according to the methods set forth in subpart C of 40 C.F.R. § Part 261, or according to an equivalent method approved by the Administrator under 40 C.F.R. § 260.21; or</p> <p>(2) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used.</p>	Generation of solid waste which is not excluded under 40 C.F.R. § 261.4(a) – applicable	40 C.F.R. § 262.11(c)
Characterization of <i>hazardous waste</i> (all primary and secondary wastes)	Must obtain a detailed chemical and physical analysis on a representative sample of the waste(s), which at a minimum contains all the information that must be known to treat, store, or dispose of the waste in accordance with pertinent sections of 40 C.F.R. § 264 and 268.	Generation of RCRA hazardous waste for storage, treatment or disposal – applicable	40 C.F.R. § 264.13(a)(1)
Determinations for management of hazardous waste	Must determine if the hazardous waste meets the treatment standards in 40 C.F.R. § 268.40, 268.45, or 268.49 by testing in accordance with prescribed methods or use of generator knowledge of waste.	Generation of hazardous waste for storage, treatment or disposal – applicable	40 C.F.R. § 268.7(a)

Action	Requirements	Prerequisite	Citation(s)
	Must comply with the special requirements of 40 C.F.R. § 268.9 in addition to any applicable requirements in C.F.R. § 268.7.	Generation of waste or soil that displays a hazardous characteristic of ignitability, corrosivity, reactivity, or toxicity for storage, treatment or disposal – applicable	40 C.F.R. § 268.7(a)
Soil and groundwater standards	TACO establishes a framework for determining soil and groundwater TBC remediation objectives and standards, and for establishing institutional controls. Tier 1 remediation objectives are set at 10^{-6} ELCR and HI = 1 values. Section 742.900(d) Tier 3 remediation objectives allow cleanup levels within the ELCR range of 10^{-4} to 10^{-6} .	TACO is a voluntary program and is not required (Part 742.105 (a)). It provides guidance for development of site-specific soil and groundwater remediation objectives – to be considered	IAC Title 35, Part 742, Tiered Approach to Corrective Action Objectives (TACO)
Waste Storage – Primary Waste (e.g., excavated soils/sediments, sludge, debris) and Secondary Wastes (e.g., treatment residuals and wastewaters)			
Temporary on-site storage of hazardous waste in containers	<p>A generator may accumulate hazardous waste at the facility provided that:</p> <ul style="list-style-type: none"> waste is placed in containers that comply with 40 C.F.R. § 265.171 – 173; the date upon which accumulation begins is clearly marked and visible for inspection on each container; container is marked with the words “hazardous waste”; 	Accumulation of RCRA hazardous waste on site as defined in 40 C.F.R. § 260.10 – applicable	<p>40 C.F.R. § 262.34(a);</p> <p>40 C.F.R. § 262.34(a)(1)(i);</p> <p>40 C.F.R. § 262.34(a)(2) and (3)</p>
	<ul style="list-style-type: none"> container may be marked with other words that identify the contents. 	Accumulation of 55 gal. or less of RCRA hazardous waste <u>or</u> one quart of acutely hazardous waste listed in 261.33(e) at or near any point of generation – applicable	40 C.F.R. § 262.34(c)(1)
Use and management of hazardous waste in containers	If container is not in good condition (e.g. severe rusting, structural defects) or if it begins to leak, must transfer waste from this container to a container that is in good condition.	Storage of RCRA hazardous waste in containers – applicable	40 C.F.R. § 265.171

Action	Requirements	Prerequisite	Citation(s)
	Must use container made or lined with materials compatible with waste to be stored so that the ability of the container to contain is not impaired.		40 C.F.R. § 265.172
	Containers must be closed during storage, except when necessary to add/remove waste. Container must not be opened, handled and stored in a manner that may rupture the container or cause it to leak.		40 C.F.R. § 265.173(a) and (b)
Temporary on-site storage of remediation waste in staging pile (e.g., excavated soils)	Must be located within the contiguous property under the control of the owner/operator where the wastes are to be managed in the staging pile originated. For purposes of this section, storage includes mixing, sizing, blending or other similar physical operations so long as intended to prepare the wastes for subsequent management or treatment.	Accumulation of <i>solid non-flowing hazardous remediation waste</i> (or remediation waste otherwise subject to land disposal restrictions) as defined in 40 C.F.R. § 260.10 – applicable	40 C.F.R. § 264.554(a)(1)
	Staging piles may be used to store hazardous remediation waste (or remediation waste otherwise subject to land disposal restrictions) based on approved standards and design criteria designated for that staging pile. Design and standards of the staging pile should be included in CERCLA Remedial Design document approved or issued by EPA.		40 C.F.R. § 264.554(b)

Action	Requirements	Prerequisite	Citation(s)
Performance criteria for staging pile	Staging pile must be designed to: <ul style="list-style-type: none"> • facilitate a reliable, effective and protective remedy; • must be designed to prevent or minimize releases of hazardous wastes and constituents into the environment, and minimize or adequately control cross-media transfer as necessary to protect human health and the environment (e.g. use of liners, covers, run-off/run-on controls). 	Storage of remediation waste in a staging pile – applicable	40 C.F.R. § 264.554(d)(1)(i) and (ii)
Operation of a staging pile	Must not operate for more than 2 years, except when an operating term extension under 40 C.F.R. § 264.554(i) is granted. <i>Note:</i> Must measure the 2-year limit (or other operating term specified) from first time remediation waste placed in staging pile	Storage of remediation waste in a staging pile – applicable	40 C.F.R. § 264.554(d)(1)(iii)
	Must not use staging pile longer than the length of time designated by EPA in appropriate decision document.		40 C.F.R. § 264.554(h)

Action	Requirements	Prerequisite	Citation(s)
Design criteria for staging pile	<p>In setting standards and design criteria must consider the following factors:</p> <ul style="list-style-type: none"> • Length of time pile will be in operation; • Volumes of waste you intend to store in the pile; • Physical and chemical characteristics of the wastes to be stored in the unit; • Potential for releases from the unit; • Hydrogeological and other relevant environmental conditions at the facility that may influence the migration of any potential releases; and • Potential for human and environmental exposure to potential releases from the unit. 	Storage of remediation waste in a staging pile – applicable	40 C.F.R. § 264.554(d)(2)(i) –(vi)
Operation of a staging pile	<p>Must not place ignitable or reactive remediation waste in a staging pile unless the remediation waste has been treated, rendered, or mixed before placed in the staging pile so that:</p> <ul style="list-style-type: none"> • the remediation waste no longer meets the definition of ignitable or reactive under 40 C.F.R. § 261.21 or 40 C.F.R. § 261.23; and • you have complied with 40 C.F.R. § 264.17(b); or <p>Must manage the remediation waste to protect it from exposure to any material or condition that may cause it to ignite or react</p>	Storage of ignitable or reactive remediation waste in staging pile – applicable .	<p>40 C.F.R. § 264.554(e)</p> <p>40 C.F.R. § 264.554(e)(1)(i)</p> <p>40 C.F.R. § 264.554(e)(1)(ii)</p> <p>40 C.F.R. § 264.554(e)(2)</p>
Operation of a staging pile	Must not place in the same staging pile unless you have complied with 40 C.F.R. § 264.17(b).	Storage of “incompatible” remediation waste (as defined in 40 C.F.R. § 260.10) in staging pile – applicable	40 C.F.R. § 264.554(f)(1)

Action	Requirements	Prerequisite	Citation(s)
Operation of a staging pile	Must separate the incompatible waste or materials, or protect them from one another by using a dike, berm, wall or other device.	Staging pile of remediation waste stored nearby to incompatible wastes or materials in containers, other piles, open tanks or land disposal units – applicable .	40 C.F.R.§ 264.554(f)(2)
	Must not pile remediation waste on same base where incompatible wastes or materials were previously piled unless you have sufficiently decontaminated the base to comply with 40 C.F.R.§ 264.17(b).		40 C.F.R.§ 264.554(f)(3)
Closure of staging pile of remediation waste	Must be closed within 180 days after the operating term by removing or decontaminating all remediation waste, contaminated containment system components, and structures and equipment contaminated with waste and leachate. Must decontaminate contaminated sub – soils in a manner that EPA determines will protect human and the environment.	Storage of remediation waste in staging pile in <i>previously contaminated area</i> – applicable	40 C.F.R.§ 264.554(j)(1) and (2)
	Must be closed within 180 days after the operating term according to 40 C.F.R.§ 264.258(a) and 264.111 or 265.258(a) and 265.111.	Storage of remediation waste in staging pile <i>in uncontaminated area</i> – applicable	40 C.F.R.§ 264.554(k)
<i>Monitoring Well Installation</i>			
Construction of groundwater monitoring well(s)	All monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole; this casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples; the annular space above the sampling depth must be sealed to prevent contamination of groundwater and samples.	Construction of RCRA groundwater monitoring well – relevant and appropriate	40 C.F.R.§ 264.97(c) 77 IAC Part 920: Illinois Water Well Construction Code

Action	Requirements	Prerequisite	Citation(s)
<i>Waste Treatment and Disposal – Primary Waste (e.g., excavated soils/sediments, sludge, debris) and Secondary Wastes (e.g., treatment residuals and wastewaters)</i>			
Disposal of RCRA hazardous waste in a land-based unit	May be land disposed if it meets the requirements in the table “Treatment Standards for Hazardous Waste” at 40 C.F.R. § 268.40 before land disposal.	Land disposal, as defined in 40 C.F.R. § 268.2, of restricted RCRA waste – relevant and appropriate	40 C.F.R. § 268.40(a)
	All underlying hazardous constituents [as defined in 40 C.F.R. § 268.2(i)] must meet the Universal Treatment Standards, found in 40 C.F.R. § 268.48 Table UTS prior to land disposal	Land disposal of restricted RCRA characteristic wastes (D001 –D043) that are not managed in a wastewater treatment system that is regulated under the CWA, that is CWA equivalent, or that is injected into a Class I nonhazardous injection well – relevant and appropriate	40 C.F.R. § 268.40(e)
	<p>To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards of 40 C.F.R. § 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentration in the waste extract or waste, or the generator may use knowledge of the waste.</p> <p>If the waste contains constituents (including UHCs in the characteristic wastes) in excess of the applicable UTS levels in 40 C.F.R. § 268.48, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.</p>	Land disposal of RCRA toxicity characteristic wastes (D004 –D011) that are newly identified (i.e., wastes, soil, or debris identified by the TCLP but not the Extraction Procedure) – relevant and appropriate	40 C.F.R. § 268.34(f)
Transport and conveyance of collected RCRA wastewater to WWTU located on the facility	Any dedicated tank systems, conveyance systems, and ancillary equipment used to treat, store or convey wastewater to an on-site NPDES-permitted wastewater treatment facility are exempt from the requirements of RCRA Subtitle C standards.	On-site wastewater treatment unit (as defined in 40 C.F.R. § 260.10) subject to regulation under § 402 or § 307(b) of the CWA (i.e., NPDES-permitted) that manages hazardous wastewaters – relevant and appropriate	40 C.F.R. § 264.1(g)(6)

Action	Requirements	Prerequisite	Citation(s)
Treatment of hazardous waste in Misc. Treatment Unit with air emissions (e.g., Air Sparging, ERH System)	Unit must be located, designed, constructed, operated and maintained, and closed in a manner that will ensure protection of human health and the environment.	Treatment of RCRA hazardous waste in miscellaneous units, except as provided in 40 C.F.R. § 264.1 – relevant and appropriate	40 C.F.R. § 264.601
	Protection of human health and the environment includes, but is not limited to: prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air, considering the factors listed in 40 C.F.R. § 264.601(c)(1) thru (7).		40 C.F.R. § 264.601(c)
	The requirements of RCRA Subpart AA– Air Emission Standards for Process Vents do not apply to process vents that would otherwise be subject to this subpart when equipped with emission controls and operated in accordance with an applicable Clean Air Act regulation codified under 40 C.F.R. § Part 60, Part 61 or Part 63.	Process vents associated with air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10ppmw – relevant and appropriate	40 C.F.R. § 264.1030(e)
	The requirements of RCRA Subpart CC – Air Emission Standards for Tanks, Surface Impoundments, and Containers do not apply to a waste management unit that is solely used for on-site treatment or storage of hazardous waste that is placed in the unit as result of implementing remedial activities required under RCRA 3004(u) and (v), or 3008(h), or CERCLA authorities.	Air pollutant emissions with volatile organics from a hazardous waste tank, surface impoundment, or container – relevant and appropriate	40 C.F.R. § 264.1080(a)(5)

Action	Requirements	Prerequisite	Citation(s)
Disposal of RCRA characteristic wastewaters in an NPDES permitted WWTU	Are not prohibited, if the wastes are managed in a treatment system which subsequently discharges to waters of the U.S. pursuant to a permit issued under 402 the CWA (i.e., NPDES permitted), unless the wastes are subject to a specified method of treatment other than DEACT in 40 C.F.R. § 268.40.	Land disposal of RCRA restricted hazardous wastewaters that hazardous only because they exhibit a characteristic and are not otherwise prohibited under 40 C.F.R. § 268 – relevant and appropriate	40 C.F.R. § 268.1(c)(4)(i)
Disposal of RCRA <i>hazardous waste debris</i> in a land-based unit (i.e., landfill)	Must be treated prior to land disposal as provided in 40 C.F.R. § 268.45(a)(1)–(5) unless EPA determines under 40 C.F.R. § 261.3(f)(2) that the debris no longer contaminated with hazardous waste <u>or</u> the debris is treated to the waste –specific treatment standard provided in 40 C.F.R. § 268.40 for the waste contaminating the debris.	Land disposal, as defined in 40 C.F.R. § 268.2, of restricted RCRA–hazardous debris – applicable	40 C.F.R. § 268.45(a)
Disposal of RCRA – <i>hazardous waste soil</i> in a land-based unit	Must be treated according to the alternative treatment standards of 40 C.F.R. § 268.49(c) <u>or</u> according to the UTSs specified in 40 C.F.R. § 268.48 applicable to the listed and/or characteristic waste contaminating the soil prior to land disposal	Land disposal, as defined in 40 C.F.R. § 268.2, of restricted hazardous soils – applicable	40 C.F.R. § 268.49(b)
Treatment of RCRA <i>hazardous waste soil</i> on-site	Prior to land disposal, all “constituents subject to treatment” as defined in 40 C.F.R. § 268.49(d) must be treated as follows:	Treatment of restricted hazardous waste soils – applicable	40 C.F.R. § 268.49(c)(1)
	<ul style="list-style-type: none"> • For non –metals (except carbon disulfide, cyclohexanone, and methanol), treatment must achieve a 90 percent reduction in total constituent concentrations, except as provided in 40 C.F.R. § 268.49(c)(1)(C) 		40 C.F.R. § 268.49(c)(1)(A)

Action	Requirements	Prerequisite	Citation(s)
	<ul style="list-style-type: none"> • For metals and carbon disulfide, cyclohexanone, and methanol), treatment must achieve a 90 percent reduction in total constituent concentrations as measured in leachate from the treated media (tested according to TCLP) <u>or</u> 90 percent reduction in total constituent concentrations (when a metal removal technology is used), except as provided in 40 C.F.R. § 268.49(c)(1)(C) 		40 C.F.R. § 268.49(c)(1)(B)
	<ul style="list-style-type: none"> • When treatment of any constituent subject to treatment to a 90 percent reduction standard would result in a concentration less than 10 times the Universal Treatment Standard for that constituent, treatment to achieve constituent concentrations less than 10 times the universal treatment standard is not required. [Universal Treatment Standards are identified in 40 C.F.R. § 268.48 Table UTS] 		40 C.F.R. § 268.49(c)(1)(C)
	In addition to the treatment requirement required by paragraph (c)(1) of this section, soils must be treated to eliminate these characteristics	Soils that exhibit the characteristic of ignitability, corrosivity or reactivity intended for land disposal – applicable	40 C.F.R. § 268.49(c)(2)
	Provides methods on how to demonstrate compliance with the alternative treatment standards for contaminated soils that will be land disposed.	On –site treatment of restricted hazardous waste soils following alternative soil treatment of 40 C.F.R. § 268.49(c) – to be considered	<i>Guidance on Demonstrating Compliance with the LDR Alternative Soil Treatment Standards</i> [EPA 530 –R –02 –003, July 2002]

Action	Requirements	Prerequisite	Citation(s)
Handling and disposal of PCB-contaminated soil	<p>PCB remediation waste left on Site must be cleaned-up to risk based levels or disposed of in accordance with performance standards or risk-based disposal methods.</p> <p>Also, provides standards and procedures for handling of PCB remediation waste being disposed of off-site.</p>	Clean-up and disposal of PCB-contaminated soil – applicable	40 C.F.R. Part 761
<i>Capping Waste in Place – Landfill Closure and Post-Closure</i>			
Landfill closure performance standard	<p>Must close the unit in a manner that:</p> <ul style="list-style-type: none"> • minimizes the need for further maintenance; and • controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to ground or surface waters or to the atmosphere; and • complies with the relevant closure and post-closure requirements of 40 C.F.R. § 264.310. 	Closure of a RCRA hazardous waste management unit – relevant and appropriate	40 C.F.R. § 264.111(a) – (c) 35 IAC Part 724 Subpart N

Action	Requirements	Prerequisite	Citation(s)
Landfill cover design and construction	<p>Must cover the landfill or cell with a final cover designed and constructed to:</p> <ul style="list-style-type: none"> • provide long-term minimization of migration of liquids through the closed landfill; • function with minimum maintenance; • promote drainage and minimize erosion or abrasion of the cover; • accommodate settling and subsidence so that the cover's integrity is maintained; and • have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present. 	Closure of a RCRA hazardous waste management unit – relevant and appropriate	40 C.F.R. § 264.310(a)(1)–(5)
Run-on/run-off control systems for landfill cover	Run-on control system must be capable of preventing flow onto the active portion of the landfill during peak discharge from a 25-year storm event.	Construction of a RCRA hazardous waste landfill cover – relevant and appropriate	40 C.F.R. § 264.301(g)
Run-on/run-off control systems for landfill cover	Run-off management system must be able to collect and control the water volume from a runoff resulting from a 24-hour, 25-year storm event.	Construction of a RCRA hazardous waste landfill cover – relevant and appropriate	40 C.F.R. § 264.301(h)
Protection of closed landfill	Post-closure use of property must never be allowed to disturb the integrity of the final cover, liners, or any other components of the containment system or the facility's monitoring system unless necessary to reduce a threat to human health or the environment.	Closure of a RCRA hazardous waste landfill – relevant and appropriate	40 C.F.R. § 264.117(c)

Action	Requirements	Prerequisite	Citation(s)
General post-closure care for closed landfill	Owner or operator must: <ul style="list-style-type: none"> • maintain the effectiveness and integrity of the final cover including making repairs to the cap as necessary to correct effects of settling, erosion, etc.; • prevent run-on and run-off from eroding or otherwise damaging final cover; and • protect and maintain surveyed benchmarks used to locate waste cells. 	Closure of a RCRA hazardous waste landfill – relevant and appropriate	40 C.F.R. § 264.310(b)(1), (5) and (6)
Hazardous soils	Soils that are characterized as hazardous waste as defined under RCRA will be taken off-site for disposal	Hazardous soils – to be considered	Off-Site Rule 40 CFR – Section 300.440
USEPA Area of Contamination Policy	Allows wastes within an Area of Contamination to be consolidated and treated in-situ without triggering RCRA LDRs or minimum technology requirements	Applicable to onsite consolidation, treatment and covering/capping of soils and sediments - to be considered	USEPA Area of Contamination Policy
Post-closure notices for closed landfill	Must submit to the local zoning authority a record of the type, location, and quantity of hazardous wastes disposed of within each cell of the unit.	Closure of a RCRA hazardous waste landfill – relevant and appropriate	40 C.F.R. § 264.119(a)
performance standards related to onsite consolidation, treatment and covering/capping of contaminated materials	The Illinois solid waste management regulations apply to the design, permitting, operations, and closure of solid waste disposal facilities used for nonhazardous wastes.	Capping of waste left in place – relevant and appropriate	IAC Title 35, Part 807 Solid Waste

Action	Requirements	Prerequisite	Citation(s)
	<p>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 a title search – that will in perpetuity notify any potential purchaser of the property that:</p> <ul style="list-style-type: none"> • land has been used to manage hazardous wastes; • its use is restricted under 40 C.F.R. § Part 264 Subpart G regulations; and • the survey plat and record of the type, location, and quantity of hazardous wastes disposed within each cell or other hazardous waste disposal unit of the facility required by Sections 264.116 and 264.119(a) have been filed with the local zoning authority and with the EPA Regional Administrator. 	<p>Closure of a RCRA hazardous waste landfill – relevant and appropriate</p>	<p>40 C.F.R. § 264.119(b)(1)(i)-(iii)</p>
Waste Transportation – Primary and Secondary Wastes			
<p>Transportation of hazardous waste <i>on-site</i></p>	<p>The generator manifesting requirements of 40 C.F.R. § 262.20–262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in 40 C.F.R. § 263.30 and 263.31 in the event of a discharge of hazardous waste on a private or public right-of-way.</p>	<p>Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way – applicable</p>	<p>40 C.F.R. § 262.20(f)</p>
<p>Transportation of hazardous waste <i>off-site</i></p>	<p>Must comply with the generator standards of Part 262 including 40 C.F.R. § 262.20–23 for manifesting, Sect. 262.30 for packaging, Sect. 262.31 for labeling, Sect. 262.32 for marking, Sect. 262.33 for placarding,</p>	<p>Preparation and initiation of shipment of hazardous waste off-site – applicable</p>	<p>40 C.F.R. § 262.10(h);</p>
<p>Transportation of <i>hazardous materials</i></p>	<p>Shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 C.F.R. § 171–180 related to marking, labeling, placarding, packaging, emergency response, etc.</p>	<p>Any person who, under contract with a department or agency of the federal government, transports “in commerce,” or causes to be transported or shipped, a hazardous material – applicable</p>	<p>49 C.F.R. § 171.1(c)</p>

Action	Requirements	Prerequisite	Citation(s)
Transportation of samples (i.e. contaminated soils and wastewaters)	Are not subject to any requirements of 40 C.F.R. Parts 261 through 268 or 270 when: the sample is being transported to a laboratory for the purpose of testing; the sample is being transported back to the sample collector after testing; or the sample is being stored by sample collector before transport to a lab for testing	Samples of solid waste <u>or</u> a sample of water, soil for purpose of conducting testing to determine its characteristics or composition - applicable	40 C.F.R. § 261.4(d)(1)(i)–(iii)
	In order to qualify for the exemption in paragraphs (d)(1)(i) and (ii), a sample collector shipping samples to a laboratory must: Comply with U.S. DOT, U.S. Postal Service, or any other applicable shipping requirements; Assure that the information provided in (1) thru (5) of this section accompanies the sample; Package the sample so that it does not leak, spill, or vaporize from its packaging.		40 C.F.R. § 261.4(d)(2)(i)(A) and (B)
<i>Dredging and Discharges of Pollutants into Navigable Waters</i>			
Discharges of pollutants into navigable waters	Regulates discharges of pollutants to navigable waters	Contaminated material remains on-site that may impact surface water run-off - applicable	40 CFR Part 122 National Pollutant Discharge Elimination System (NPDES)
Water quality standards for State of Illinois	Establishes general use standards to protect Illinois water for aquatic life, wildlife, agricultural use, primary and secondary contact uses, most industrial uses, and to ensure the aesthetic quality of the aquatic environment	Groundwater is classified as Class II – applicable	35 IAC Part 302: Water Quality Standards Subpart B: General Use Water Quality Standards
<i>Environmental Covenants</i>			
Establishes restrictions on properties where waste is left in place	Establishes prohibited activities, and implements controls to ensure contaminated land does not pose risks	Residual contamination remains on Site at a level that does not allow for unlimited use and unrestricted exposure after cleanup – applicable	Illinois Environmental Covenants Act: 765 ILCS 122

Action	Requirements	Prerequisite	Citation(s)
General Standards—Asbestos Demolition, Collection, Packaging and Disposal			
Activities potentially causing asbestos emissions	Discharge no visible emissions to the outside air during the collection, processing (including incineration), packaging and transporting of any asbestos-containing material generated by the source, or use one of the emission control and waste treatment methods specified in paragraphs (a)(1) through (4) of this section.	Owner or operator of any source covered under the provisions of § 61.145 <i>Standard for demolition and renovation</i> – applicable	40 CFR § 61.150(a)
Emission control methods	<p>Adequately wet asbestos-containing waste material as follows:</p> <ul style="list-style-type: none"> • Mix control device asbestos waste to form a slurry; adequately wet other asbestos-containing waste material; and • Discharge no visible emissions to the outside air from collection, mixing, wetting, and handling operations, or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air; and • After wetting, seal all asbestos-containing waste material in leak-tight containers while wet; or, for materials that will not fit into containers without additional breaking, put materials into leak-tight wrapping; and • Label the containers or wrapped materials specified in paragraph (a)(1)(iii) of this section using warning labels specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(4) or 1926.1101(k)(8). The labels shall be printed in letters of sufficient size and contrast so as to be readily visible and legible. • For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated. 	Owner or operator of any source covered under the provisions of § 61.145 <i>Standard for demolition and renovation</i> – applicable	40 CFR § 61.150(a)(1)(i) – (v)
Emission control for processing	<p>Process asbestos-containing waste material into non-friable forms as follows:</p> <ol style="list-style-type: none"> (i) Form all asbestos-containing waste material into non-friable pellets or other shapes; (ii) Discharge no visible emissions to the outside air from collection and processing operations, including incineration, or use other method specified in § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented, the outside air. 	Owner or operator of any source covered under the provisions of § 61.145 <i>Standard for demolition and renovation</i> – applicable	40 CFR § 61.150(a)(2)(i) and (ii)

Action	Requirements	Prerequisite	Citation(s)
Emission control for asbestos-containing waste after demolition	<p>Adequately wet the asbestos-containing waste material at all times after demolition and keep wet during handling and loading for transport to a disposal site.</p> <p>Asbestos-containing waste materials covered by this paragraph do not have to be sealed in leak-tight containers or wrapping but may be transported and disposed of in bulk.</p>	Facilities demolished where RACM (as defined in 40 CFR § 61.141), is not removed prior to demolition according to §61.145(c)(1)(i)-(iv) <u>or</u> for facilities demolished according to § 61.145(c)(9) – applicable	40 CFR § 61.150(a)(3)
Disposal of asbestos-containing waste material	<p>All asbestos-containing waste material shall be deposited as soon as practicable by the waste generator at:</p> <ul style="list-style-type: none"> • A waste disposal site operated in accordance with the provisions of § 61.154, or • An EPA-approved site that converts RACM and asbestos-containing waste material into non-asbestos (asbestos-free) material according to the provisions of § 61.155. • The requirements of paragraph (b) of this section do not apply to Category I non-friable ACM that is not RACM. 	Owner or operator of any source covered under the provisions of § 61.145 <i>Standard for demolition and renovation</i> – applicable	40 CFR § 61.150(b)(1)-(3)
Pre-transport of asbestos-containing waste material	<p>Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that the signs are visible.</p> <p>The markings must conform to the requirements of §§ 61.149(d)(1)(i), (ii), and (iii).</p>	Owner or operator of any source covered under the provisions of § 61.145 <i>Standard for demolition and renovation</i> – applicable	40 CFR § 61.150(c)

Action	Requirements	Prerequisite	Citation(s)
Remediation of soils contaminated with asbestos	<p>No commercial activity, not otherwise hereinafter prohibited, involving the potential discharge of visible amounts of asbestos fiber or asbestos-containing materials into the ambient air from the construction, alteration, repair or demolition of a structure or from the processing or manufacturing of asbestos-containing products, shall be conducted unless the person or entity in charge of such activity complies with the following:</p> <p>a) Personnel shall be designated to exercise full-time supervisory authority over all aspects of the activity from which the release of asbestos fiber into the environment could result, in such a manner as to insure compliance with the pertinent asbestos control regulations.</p> <p>b) Each employee engaged in such activity shall complete a course of instruction on the potential hazards of exposure to asbestos fiber, including the precautions that must be observed to prevent or restrict the dispersion of asbestos fiber into the environment.</p> <p>c) Facilities shall be provided and procedures instituted and supervised that prevent the removal from the site of visible amounts of asbestos-containing material on the clothing of the employees.</p> <p>d) Asbestos-containing wastes shall be immediately vacuumed or otherwise collected where vacuuming is impossible, and shall be placed in a container resistant to tearing or breaking under normal handling conditions, which shall be tightly sealed and clearly marked as containing asbestos waste. Such containers shall be placed directly upon a vehicle for disposal by burial at a sanitary landfill. Exception: This subsection (d) shall not apply to the demolition of a structure, except as provided in Section 229.141(d) and (e) or to the disposal of sludge waste except as provided in Section 228.156.</p>	Soils contaminated with asbestos – applicable	35 IAC Part 228

Action	Requirements	Prerequisite	Citation(s)
<i>Standards for Demolition and Renovation Activity</i>			
Inspection of facility for asbestos	<p>Prior to the commencement of the demolition or renovation, thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos, including Category I and Category II non-friable ACM.</p> <p>The requirements of paragraphs (b) and (c) of § 61.145 apply to each owner or operator of a demolition or renovation activity, including the removal of RACM.</p> <p>NOTE: The <i>Notification requirements</i> of paragraph (b) of § 61.145 are considered “administrative” and therefore not identified as ARARs. However, some of the information included in the notice, for example a description of work to be performed and methods to be employed, work practices and engineering controls used to comply with the requirements of Subpart M, including asbestos removal and waste-handling emission control procedures should be included in the CERCLA decision document (e.g., ROD, Action Memorandum) and/or a subsequent Remedial Action or Removal Action Work Plan.</p>	Demolition or renovation of a facility which may cause a disturbance of friable asbestos material and exceed the thresholds in 40 CFR 61.145(a)(1) – applicable	40 CFR § 61.145(a)
Investigation of Asbestos at Superfund Sites	Superfund sites that are being investigated and characterized where asbestos has the potential for human exposure in outdoor soil and indoor dust at Superfund removal and remedial sites	Investigations that find the presence of asbestos at a Superfund site – to be considered	OSWER DIRECTIVE #9200.0-68, SEPTEMBER 2008
RACM Thresholds	<p>In a facility being demolished, all the requirements of paragraphs (b) and (c) of § 61.145 apply, except as provided in paragraph (a) of § 61.145, if the combined amount of RACM is</p> <ul style="list-style-type: none"> (i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or (ii) At least 1 cubic meter (35 cubic feet) of facility components where the length or area could not be measured previously. <p>NOTE: The <i>Notification requirements</i> of paragraph (b) of § 61.145 are considered “administrative” and therefore not identified as ARARs.</p>	Demolition of a facility which may cause a disturbance of friable asbestos material – applicable	40 CFR § 61.145(a)(1)
Requirements for buildings determined to be structurally unsound	Only the requirements of § 61.145(c)(4) through (c)(9) apply.	Facility being demolished under an order of a State or local government agency, issued because the facility is structurally unsound and in danger of imminent collapse – applicable	40 CFR § 61.145(a)(3)

Action	Requirements	Prerequisite	Citation(s)
	Adequately wet the portion of the facility that contains RACM during the wrecking operation.		40 CFR § 61.145(c)(9)
Procedures for asbestos emission control	<p>Remove all RACM from a facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal.</p> <p>RACM need not be removed before demolition if:</p> <ul style="list-style-type: none"> (i) It is Category I non-friable ACM that is not in poor condition and is not friable. (ii) It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition; or (iii) It was not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, the material cannot be safely removed. If not removed for safety reasons, the exposed RACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and adequately wet at all times until disposed of. (iv) They are Category II non-friable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition. 	Demolition or renovation of a facility which may cause a disturbance of friable asbestos material and exceed the thresholds in 40 CFR 61.145(a)(1) – applicable	40 CFR § 61.145(c)(1)(i)-(iv)
	<p>When a facility component that contains, is covered with, or is coated with RACM is being taken out of the facility as a unit or in sections:</p> <ul style="list-style-type: none"> (i) Adequately wet all RACM exposed during cutting or disjoining operations; and (ii) Carefully lower each unit or section to the floor and to ground level, not dropping, throwing, sliding, or otherwise damaging or disturbing the RACM. 	Demolition or renovation of a facility which may cause a disturbance of friable asbestos material and exceed the thresholds in 40 CFR 61.145(a)(1) – applicable	40 CFR § 61.145(c)(2)
	When RACM is stripped from a facility component while it remains in place in the facility, adequately wet the RACM during the stripping operation.		40 CFR § 61.145(c)(3)

Action	Requirements	Prerequisite	Citation(s)
Procedures for asbestos emission control (<i>con't.</i>)	<p>Component shall be stripped <u>or</u> contained in leak-tight wrapping, except as described in § 61.145(c)(5). If stripped, either:</p> <ul style="list-style-type: none"> (i) Adequately wet the RACM during stripping; or (ii) Use a local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in § 61.152. 	A facility component covered with, coated with RACM (as defined in 40 CFR § 61.141), taken out of the facility as a unit or in sections pursuant to 40 CFR § 61.145(c)(2) – applicable	40 CFR § 61.145(c)(4)(i) and (ii)
	<p>The RACM is not required to be stripped if the following requirements are met:</p> <ul style="list-style-type: none"> (i) The component is removed, transported, stored, disposed of, or reused without disturbing or damaging the RACM. (ii) The component is encased in a leak-tight wrapping. (iii) The leak-tight wrapping is labeled according to § 61.149(d)(1)(i), (ii), and (iii) during all loading and unloading operations and during storage. 	Large facility components such as reactor vessels, large tanks, and steam generators, but not beams containing RACM (as defined in 40 CFR § 61.141) – applicable	40 CFR § 61.145(c)(5)(i)-(iii)
Requirements for RACM (i.e., removed or stripped)	<p>For all RACM, including material that has been removed or stripped:</p> <ul style="list-style-type: none"> (i) Adequately wet the material and ensure that it remains wet until collected and contained or treated in preparation for disposal in accordance with § 61.150; and (ii) Carefully lower the material to the ground and floor, not dropping, throwing, sliding, or otherwise damaging or disturbing the material. (iii) Transport the material to the ground via leak-tight chutes or containers if it has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections. (iv) RACM contained in leak-tight wrapping that has been removed in accordance with paragraphs (c)(4) and (c)(3)(i)(B)(3) of § 61.145 need not be wetted. 	Generation of RACM (as defined in 40 CFR § 61.141), from demolition or renovation of a facility – applicable	40 CFR § 61.145(c)(6)(i)-(iv)

Action	Requirements	Prerequisite	Citation(s)
Removal of RACM in freezing temperatures	<p>The owner or operator need not comply with paragraph § 61.145(c)(2)(i) and the wetting provisions of § 61.145(c)(3). Shall remove facility components containing, coated with, or covered with RACM as units or in sections to the maximum extent possible.</p> <p>NOTE: Under § 61.145(c)(7)(iii), must record the temperature in the area containing the facility components at the beginning, middle and end of each workday and keep daily temperature records available for inspection. Recordkeeping requirements are generally considered "administrative" and therefore not identified as ARARs.</p>	Removal of RACM (as defined in 40 CFR § 61.141), when the temperature at the point of wetting is below 0 °C (32 °F) – applicable	40 CFR § 61.145(c)(7)(i)-(ii)
Burning of facility containing asbestos	If a facility is demolished by intentional burning, all RACM including Category I and Category II non-friable ACM must be removed in accordance with the NESHAP before burning.	Demolition of a facility which may cause a disturbance of friable asbestos material and exceed the thresholds in 40 CFR 61.145(a)(1) – applicable	40 CFR § 61.145(c)(10)
<i>Capping Asbestos Waste In Place</i>			
Standards for inactive asbestos waste disposal sites	<p>Must comply with one of the following:</p> <ul style="list-style-type: none"> • Either discharge no visible emissions to the outside air from an inactive disposal site subject to this paragraph; or • Cover the asbestos-containing waste material with at least 15 centimeters (6 inches) of compacted non-asbestos-containing material, and grow and maintain a cover of vegetation on the area to prevent exposure of the asbestos-containing waste material; or • Cover the asbestos-containing waste material with at least 60 centimeters (2 feet) of compacted non-asbestos-containing material, and maintain it to prevent exposure of the asbestos-containing waste 	Closure of an area that received asbestos-containing waste materials – relevant and appropriate	40 CFR § 61.151(a)(1)-(3)
Warning signs for disposal site	Display warning signs at all entrances and at intervals of 100m (328 feet) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited.	Closure of an area that received asbestos-containing waste materials that does not include a natural barrier to adequately deter access by the general public – relevant and appropriate	40 CFR § 61.151(b)(1)

Action	Requirements	Prerequisite	Citation(s)
	<p>The warning signs must:</p> <ul style="list-style-type: none"> (i) Be posted in such a manner and location that a person can easily read the legend; and (ii) Conform to the requirements for (20"x14") upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and (iii) Display the legend as prescribed in § 61.151(b)(1)(iii) located in the lower panel with letter sizes and styles of visibility at least equal to those specified in § 61.151(b)(1)(iii). 	<p>Closure of an area that received asbestos-containing waste materials that does not include a natural barrier to adequately deter access by the general public – relevant and appropriate</p>	<p>40 CFR § 61.151(b)(1)(i)-(iii)</p>
<p>Fence for disposal site</p>	<p>Fence the perimeter of the site in a manner adequate to deter access by the general public.</p>		<p>40 CFR § 61.151(b)(2)</p>
<p>Deed notice for asbestos waste disposal site</p>	<p>Record, in accordance with State law, a notation on the deed to the facility property and on any other instrument that would normally be examined during a title search; this notation will in perpetuity notify any potential purchaser of the property that:</p> <ul style="list-style-type: none"> • The land has been used for disposal of asbestos-containing waste material; and • The survey plat and record of the location and quantity of asbestos containing waste disposed of within the disposal site required in § 61.154(f) have been filed with the Administrator; and • The site is subject to 40 CFR part 61, Subpart M. <p>NOTE: Recordation of deed notice that informs potential purchaser on the waste disposal site is considered a substantive requirement for post-closure.</p>	<p>Closure of an inactive disposal area that received asbestos containing waste materials – relevant and appropriate</p>	<p>40 CFR § 61.151(e)(1)-(3)</p>

ARAR = applicable or relevant and appropriate requirement

CFR = Code of Federal Regulations

RACM = regulated asbestos-containing material

Subpart M = National Emission Standard for Asbestos located at 40 CFR 61.140 *et seq.*

Table 4

Summary of Comparative Analysis

**Table 4
Summary of Comparative Analysis**

Media - Area	Alternative	THRESHOLD CRITERIA ¹		PRIMARY BALANCING CRITERIA ²					MODIFYING CRITERIA ³		CERCLA Criteria - Alternative Total Score	CERCLA Criteria - Alternative Rank	OTHER CRITERIA ^{2,4}
		Overall protectiveness of human health and the environment	Compliance with ARARs	Long-term effectiveness and permanence	Reduction of toxicity, mobility, or volume through treatment	Short-term effectiveness	Implementability	Cost (relative to other alternatives)	State acceptance	Community acceptance			Sustainability ⁵
OUI Plant Area	Alt 1 - No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	4	NA
	Alt 4 - Excavation + IC + Property Access Restrict	Pass	Pass	5	2	2	3	2	NA	NA	14	2	12
	Alt 5 - Low Perm Cap + IC + Property Access Restrict	Pass	Pass	4	2	3	4	5	NA	NA	18	1	16
	Alt 6 - Soil Cover + IC + Property Access Restrict	Pass	Pass	2	1	3	4	2	NA	NA	12	3	15
OUI Slag Pile Area	Alt 1 - No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	7	NA
	Alt 4 - Excavation + Off-Site Disposal + IC + Property Access Restrict	Pass	Pass	5	2	2	2	1	NA	NA	12	6	12
	Alt 12 - Excavation + On-Site Consolidation (OU2) + IC + Property Access Restrict	Pass	Pass	5	2	2	2	2	NA	NA	13	5	15
	Alt 5 - Low Perm Cap + IC + Property Access Restrict	Pass	Pass	2	2	3	3	5	NA	NA	15	3	18
	Alt 6 - Soil Cover + IC + Property Access Restrict	Pass	Pass	2	1	3	3	5	NA	NA	14	4	17
	Alt 14 - Sloping and Benching + Revelements + BMPs	Pass	Pass	3	2	4	3	4	NA	NA	16	2	18
	Alt 15 - Sloping and Benching + Plantings + Revelements + BMPs	Pass	Pass	4	2	4	3	4	NA	NA	17	1	19

Notes:

- 1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criteria are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.
- 2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of the scales for each criteria are listed below:

Long-term effectiveness and permanence:

- 1 = In-effective and temporary
- 2 = Somewhat effective
- 3 = Effective
- 4 = Highly effective
- 5 = Highly effective and permanent

Implementability:

- 1 = Very difficult to implement
- 2 = Difficult to implement
- 3 = Implementable
- 4 = Readily implementable
- 5 = Easily implementable

Reduction of toxicity, mobility, or volume through treatment:

- 1 = Does not reduce toxicity, mobility, or volume
- 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
- 3 = Ineffective at reducing toxicity, mobility, and/or volume
- 4 = Highly effective at reducing toxicity, mobility, and/or volume
- 5 = Complete reduction of toxicity, mobility, and/or volume

Cost (relative to other alternatives):

- Ranked by total net present value cost

Sustainability (relative to other alternatives):

- Ranked by sustainability evaluations presented in Section 4

Short-term effectiveness (impact to community, site workers, and environment):

- 1 = Detrimental impacts during implementation
- 2 = Significant impacts during implementation
- 3 = Minimal impacts during implementation
- 4 = Slight impact during implementation
- 5 = No impacts during implementation

- 3 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS report and the proposed plan, and will be addressed in the ROD.
- 4 The Other Criterion, sustainability, is not required by the CERCLA 1988 RI/FS guidance but it has been included for completeness.
- 5 The Sustainability score development is presented in Tables 4.2.1-4 and 4.2.2-4. Sustainability scores range from 5 to 25.

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**Table 4
Summary of Comparative Analysis**

Media Area	Alternative	THRESHOLD CRITERIA ¹		PRIMARY BALANCING CRITERIA ²					MODIFYING CRITERIA ³		CERCLA Criteria Alternative Total Score	CERCLA Criteria Alternative Rank	OTHER CRITERIA ⁴ Sustainability ⁵
		Overall protection of human health and the environment	Compliance with ARARs	Long-term effectiveness and permanence	Reduction of toxicity, mobility, or volume through treatment	Short-term effectiveness	Implementability	Cost (relative to other alternatives)	State acceptance	Community acceptance			
OU2 Soil B100 Area	Alternative 1 No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	NA	Highly sustainable
	Alternative 2 Institutional Controls Only	Pass	Pass	2	1	5	4	3	NA	NA	15	2	Highly sustainable
	Alternative 3 Soil Excavation + On-Site Consolidation under Soil Cover	Pass	Pass	5	2	3	4	2	NA	NA	16	1	Moderately sustainable
	Alternative 4 Soil Excavation + Off-Site Disposal	Pass	Pass	5	2	2	5	1	NA	NA	15	3	Somewhat sustainable
OU2 Soil RM Area	Alternative 1 No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	NA	Highly sustainable
	Alternative 2 Institutional Controls Only	Pass	Pass	2	1	5	4	4	NA	NA	16	3	Highly sustainable
	Alternative 3 Soil Excavation + On-Site Consolidation under Soil Cover	Pass	Pass	5	2	3	4	3	NA	NA	17	1	Moderately sustainable
	Alternative 4 Soil Excavation + Ex-Site Treatment by Soil Washing	Pass	Pass	3	4	3	3	1	NA	NA	14	4	Somewhat sustainable
	Alternative 5 Soil Excavation + Off-Site Disposal	Pass	Pass	5	2	2	5	2	NA	NA	16	2	Somewhat sustainable
OU2 Soil MIA Area	Alternative 1 No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	NA	Highly sustainable
	Alternative 2 Soil Excavation + On-Site Consolidation under Soil Cover + Institutional Controls	Pass	Pass	4	2	3	4	4	NA	NA	17	1	Moderately sustainable
	Alternative 3 Ex-Site Chemical Stabilization	Pass	Pass	2	2	3	4	3	NA	NA	14	4	Somewhat sustainable
	Alternative 4 Soil Excavation + Ex-Site Treatment by Soil Washing	Pass	Pass	3	4	3	3	1	NA	NA	14	3	Somewhat sustainable
	Alternative 5 Soil Excavation + Off-Site Disposal	Pass	Pass	5	2	2	5	2	NA	NA	16	2	Somewhat sustainable
OU2 Soil N Area	Alternative 1 No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	NA	Highly sustainable
	Alternative 2 Institutional Controls Only	Pass	Pass	2	1	5	4	4	NA	NA	16	1	Highly sustainable
	Alternative 3 Phytoremediation + Institutional Controls	Pass	Pass	3	3	4	3	3	NA	NA	16	2	Moderately sustainable
	Alternative 4 Soil Excavation + On-Site Consolidation under Soil Cover	Pass	Pass	5	2	2	4	2	NA	NA	15	3	Moderately sustainable
	Alternative 5 Soil Excavation + Off-Site Disposal	Pass	Pass	5	2	1	5	1	NA	NA	14	4	Somewhat sustainable
OU2 Soil RES Area	Alternative 1 No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	NA	Highly sustainable
	Alternative 2 On-Site Soil Cover + Institutional Controls	Pass	Pass	2	2	2	2	2	NA	NA	10	3	Somewhat sustainable
	Alternative 3 Soil Excavation + On-Site Consolidation under Soil Cover	Pass	Pass	5	2	2	3	3	NA	NA	15	1	Moderately sustainable
	Alternative 4 Soil Excavation + Off-Site Disposal	Pass	Pass	5	2	2	3	1	NA	NA	13	2	Somewhat sustainable
OU2 GW	Alternative 1 No Action	Fail	Fail	NA	NA	NA	NA	NA	NA	NA	NA	NA	Highly sustainable
	Alternative 2 Institutional Controls and Masterting	Pass	Pass	2	1	5	5	3	NA	NA	16	1	Highly sustainable
	Alternative 3 Subslab Depressurization + Institutional Controls	Pass	Pass	3	1	4	4	2	NA	NA	14	3	Moderately sustainable
	Alternative 4 In-Site Chemical Oxidation + Institutional Controls	Pass	Pass	4	4	3	3	1	NA	NA	15	2	Highly sustainable

Notes:

Dark grey highlighting indicates a ranking of 1 for all compared alternatives within each medium/area

1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criterion are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria

2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of these scales for each criterion are listed below:

- Long-term effectiveness and permanence**
- 1 = Ineffective and temporary
 - 2 = Somewhat effective
 - 3 = Effective
 - 4 = Highly effective
 - 5 = Highly effective and permanent

- Reduction of toxicity, mobility, or volume through treatment**
- 1 = Does not reduce toxicity, mobility, or volume
 - 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
 - 3 = Effective at reducing toxicity, mobility, and/or volume
 - 4 = Highly effective at reducing toxicity, mobility, and/or volume
 - 5 = Complete reduction of toxicity, mobility, and/or volume

- Short-term effectiveness (impact to community, site workers, and environment)**
- 1 = Detrimental impacts during implementation
 - 2 = Significant impacts during implementation
 - 3 = Minimal impacts during implementation
 - 4 = Slight impact during implementation
 - 5 = No impacts during implementation

- Implementability**
- 1 = Very difficult to implement
 - 2 = Difficult to implement
 - 3 = Implementable
 - 4 = Readily implementable
 - 5 = Easily implementable

- Cost (relative to other alternatives)**
- Ranked by total net present value cost

- Sustainability (relative to other alternatives)**
- Ranked by sustainability evaluations presented in Section

3 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS Report and the Proposed Plan, and will be addressed in the ROI

4 The Other Criteria, sustainability, is not required by CERCLA, but it has been included for completeness

5 The sustainability score development is presented in Table 4.3.3-3, evaluated on a scale of 1-25, with sustainability score range definitions below:

- Sustainability: Criterion Score (relative to other alternatives)**
- Ranked by sustainability evaluations presented in Section
 - 1-5 = Not sustainable
 - 6-10 = Potentially sustainable
 - 11-15 = Somewhat sustainable
 - 16-20 = Moderately sustainable
 - 21-25 = Highly sustainable

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Table 5
Detailed Comparative Analysis

**Table 5- Detailed Comparative Analysis
OU1 - Plant Area**

Evaluation Criteria	OU1 Plant Area Remedial Alternatives ¹			
	Alt 1 - No Action	Alt 4 - Excavation + IC + Property Access Restrict	Alt 5 - Low Perm Cap + IC + Property Access Restrict	Alt 6 - Soil Cover + IC + Property Access Restrict
THRESHOLD CRITERIA²				
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA³				
Long-term effectiveness and permanence	NA	Highly effective and permanent	Highly effective	Somewhat effective
Criterion Score		5	4	2
Reduction of toxicity (T), mobility (M), or volume (V) through treatment	NA	No treatment; contaminant M reduced through offsite disposal	No treatment; contaminant exposure and M reduced through capping	No treatment; contaminant exposure reduced by soil cover
Criterion Score		2	2	1
Short-term effectiveness	NA	Moderate impacts during implementation	Minimal impacts during implementation	Minimal impacts during implementation
Criterion Score		2	3	3
Implementability	NA	Implementable, but challenging excavation areas	Easily implementable	Easily implementable
Criterion Score		3	4	4
Cost (relative to other alternatives) ⁴	NA	\$4.14 M / \$5.95 M / \$6.39 M	\$1.30 M / \$1.53 M / \$1.57 M	\$1.43 M / \$1.62 M / \$1.67 M
Criterion Score		1	5	4
MODIFYING CRITERIA⁵				
CERCLA Criteria - Alternative Total Score	NA	13	18	14
CERCLA Criteria - Alternative Rank	4	3	1	2
OTHER CRITERIA^{3,6}				
Sustainability ⁷	NA	12	16	15
Sustainability - Alternative Rank	4	3	1	2

Notes:

- OU1 Plant Area Alternatives 2, 3, 7, 8, and 9 were not carried forward after the initial alternative screening process (see Section 3 of FS).
- The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criteria are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.
- The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of the scales for each criteria are listed below:
 - Long-term effectiveness and permanence:**
 - 1 = In-effective and temporary
 - 2 = Somewhat effective
 - 3 = Effective
 - 4 = Highly effective
 - 5 = Highly effective and permanent
 - Reduction of toxicity, mobility, or volume through treatment:**
 - 1 = Does not reduce toxicity, mobility, or volume
 - 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
 - 3 = Effective at reducing toxicity, mobility, and/or volume
 - 4 = Highly effective at reducing toxicity, mobility, and/or volume
 - 5 = Complete reduction of toxicity, mobility, and/or volume
 - Short-term effectiveness (impact to community, site workers, and environment):**
 - 1 = Detrimental impacts during implementation
 - 2 = Significant impacts during implementation
 - 3 = Minimal impacts during implementation
 - 4 = Slight impact during implementation
 - 5 = No impacts during implementation
 - Implementability:**
 - 1 = Very difficult to implement
 - 2 = Difficult to implement
 - 3 = Implementable
 - 4 = Readily implementable
 - 5 = Easily implementable
 - Cost (relative to other alternatives):**
 - Ranked by total net present value cost
 - Sustainability (relative to other alternatives):**
 - Ranked by sustainability evaluations presented in Section 4
- Cost is present in millions of dollars. A full presentation of alternative costs can be found in Section 4 of the FS.
- The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS report and the proposed plan, and will be addressed in the ROD.
- The Other Criterion, sustainability, is not required by the CERCLA 1988 RI/FS guidance but it has been included for completeness.
- The Sustainability score development is presented in Table 4.2.1-4. Sustainability scores range from 5 to 25.

of the FS.

**Table 5 - Detailed Comparative Analysis
OU1 - Slag Pile**

Evaluation Criteria	OU1 Slag Pile Area Remedial Alternatives						
	Alt 1 - No Action	Alt 4 - Excavation + Off-Site Disposal + IC + Property Access Restrict	Alt 13 - Excavation + On-Site Consolidation (OUI) + IC + Property Access Restrict	Alt 5 - Low Perm Cap + IC + Property Access Restrict	Alt 6 - Ball Cover + IC + Property Access Restrict	Alt 14 - Sloping and Benching + Retainments + BMPs	Alt 15 - Sloping and Benching + Fillings + Retainments + BMPs
THRESHOLD CRITERIA ¹							
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA ³							
Long-term effectiveness and permanence	NA	Highly effective and permanent	Highly effective and permanent	Somewhat effective	Somewhat effective	Effective and permanent	Highly effective and permanent
Criterion Score		5	5	2	2	3	4
Reduction of toxicity (T), mobility (M), or volume (V) through treatment	NA	No treatment; onsite T, M, and V reduced through offsite disposal	No treatment; onsite T, M, and V reduced through offsite disposal	No treatment; contaminant T and M reduced through capping	No treatment; contaminant T reduced by soil cover	No treatment; contaminant M reduced through erosion controls	No treatment; contaminant M reduced through erosion controls
Criterion Score		2	2	2	1	2	2
Short-term effectiveness	NA	Moderate impacts during implementation	Moderate impacts during implementation	Minimal impacts during implementation	Minimal impacts during implementation	Slight impact during implementation	Slight impact during implementation
Criterion Score		2	2	3	3	4	4
Implementability	NA	Difficult to implement	Difficult to implement	Implementable, but challenging working on steep slopes	Implementable, but challenging working on steep slopes	Implementable, but challenging benching areas on slopes	Implementable, but challenging benching areas on slopes
Criterion Score		2	2	3	3	3	3
Cost (relative to other alternatives) ⁴	NA	\$214.1 M	\$101.6 M	\$5.28 M / \$7.31 M / \$7.31 M	\$5.15 M / \$7.09 M / \$7.09 M	\$17.99 M / \$18.25 M	\$18.12 M / \$18.42 M
Criterion Score		1	2	5	5	4	4
MODIFYING CRITERIA ⁵							
CERCLA Criteria - Alternative Total Score	NA	12	13	15	14	16	17
CERCLA Criteria - Alternative Rank	7	6	5	3	4	2	1
OTHER CRITERIA ^{3,6}							
Sustainability ⁷	NA	12	15	18	17	18	19
Sustainability - Alternative Rank	7	6	5	2	4	2	1

Notes:

- OU1 Slag Pile Area Alternatives 2, 3, 7, 8, 9, 10, 11, and 13 were not carried forward after the initial alternative screening process (see Section 3 of FS).
- The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criteria are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.
- The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of the scales for each criterion are listed below:
 - Long-term effectiveness and permanence:**
 - 1 = In-effective and temporary
 - 2 = Somewhat effective
 - 3 = Effective
 - 4 = Highly effective
 - 5 = Highly effective and permanent
 - Reduction of toxicity, mobility, or volume through treatment:**
 - 1 = Does not reduce toxicity, mobility, or volume
 - 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
 - 3 = Effective at reducing toxicity, mobility, and/or volume
 - 4 = Highly effective at reducing toxicity, mobility, and/or volume
 - 5 = Complete reduction of toxicity, mobility, and/or volume
 - Short-term effectiveness (impact on community, site workers, and environment):**
 - 1 = Detrimental impacts during implementation
 - 2 = Significant impacts during implementation
 - 3 = Minimal impacts during implementation
 - 4 = Slight impact during implementation
 - 5 = No impacts during implementation
- Cost is presented in millions of dollars. A full presentation of alternative costs can be found in Section 4 of the FS.
- The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS report and the proposed plan, and will be addressed in the ROD.
- The Other Criterion, sustainability, is not required by the CERCLA 1988 RI/FS guidance but it has been included for completeness.
- The Sustainability score development is presented in Table 4.2.2-4. Sustainability scores range from 5 to 25.

of the FS.

**Table 5 - Detailed Comparative Analysis
OU2 - MIA**

Evaluation Criteria	OU2 Soil MIA Area Remedial Alternatives				
	Alternative 1 No Action	Alternative 2 Soil Excavation + On-Site Consolidation under Soil Cover + Institutional Controls	Alternative 3 <i>Ex Situ</i> Chemical Stabilization	Alternative 4 Soil Excavation + <i>Ex Situ</i> Treatment by Soil Washing	Alternative 5 Soil Excavation + Off-Site Disposal
THRESHOLD CRITERIA ¹					
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA ²					
Long-term effectiveness and permanence	NA	Highly effective	Somewhat effective	Effective	Highly effective and permanent
Criteria Score		4	2	3	5
Reduction of toxicity, mobility, or volume through treatment	NA	Somewhat effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume	Highly effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume
Criteria Score		2	2	4	2
Short-term effectiveness	NA	Minimal impacts during implementation	Minimal impacts during implementation	Minimal impacts during implementation	Significant impacts during implementation
Criteria Score		3	3	3	2
Implementability	NA	Readily implementable	Readily implementable	Implementable	Easily implementable
Criteria Score		4	4	3	5
Cost (relative to other alternatives) ³	NA	\$32.7M/ \$33.6M/ \$34.9M	\$70.4M/ \$72.6M/ \$80.4M	\$177M/ \$182M/ \$204M	\$120M/ \$124M/ \$137M
Criteria Score		4	3	1	2
MODIFYING CRITERIA ⁴					
CERCLA Criteria - Alternative Total Score	NA	17	14	14	16
CERCLA Criteria - Alternative Rank		1	4	3	2
OTHER CRITERIA ^{4,5}					
Sustainability ⁶	Highly sustainable	Moderately sustainable	Somewhat sustainable	Somewhat sustainable	Somewhat sustainable

Notes:

1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criterion are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.

2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of these scales for each criterion are listed below.

Long-term effectiveness and permanence

- 1 = Ineffective and temporary
- 2 = Somewhat effective
- 3 = Effective
- 4 = Highly effective
- 5 = Highly effective and permanent

Implementability

- 1 = Very difficult to implement
- 2 = Difficult to implement
- 3 = Implementable
- 4 = Readily implementable
- 5 = Easily implementable

Reduction of toxicity, mobility, or volume through treatment

- 1 = Does not reduce toxicity, mobility, or volume
- 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
- 3 = Effective at reducing toxicity, mobility, and/or volume
- 4 = Highly effective at reducing toxicity, mobility, and/or volume
- 5 = Complete reduction of toxicity, mobility, and/or volume

Cost (relative to other alternatives)

- Ranked by total net present value cost

Sustainability (relative to other alternatives)

- Ranked by sustainability evaluations presented in Section 4

Short-term effectiveness (impact to community, site workers, and environment)

- 1 = Detrimental impacts during implementation
- 2 = Significant impacts during implementation
- 3 = Minimal impacts during implementation
- 4 = Slight impact during implementation
- 5 = No impacts during implementation

- 3 Cost is present in millions of dollars. Three risk levels of cost are presented as B1-04/E1-05/L1-06. A full presentation of alternative costs can be found in Section 4 of the FS.
- 4 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS report and the proposed plan, and will be addressed in the ROD.
- 5 The Other Criterion, sustainability, is not required by C1:RCL.A but it has been included for completeness.
- 6 The sustainability score development is presented in Table 4.3.3-3, evaluated on a scale of 1-25, with sustainability score range definitions below:
 - Sustainability Criterion Score (relative to other alternatives) *of the FS,*
 - Ranked by sustainability evaluations presented in Section 4:
 - 1-5 = Not sustainable
 - 6-10 = Potentially sustainable
 - 11-15 = Somewhat sustainable
 - 16-20 = Moderately sustainable
 - 21-25 = Highly sustainable

**Table 5 - Detailed Comparative Analysis
OU2 - N Area**

Evaluation Criteria	OU2 Soil N Area Remedial Alternatives				
	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Phytoremediation + Institutional Controls	Alternative 4 Soil Excavation + On-Site Consolidation under Soil Cover	Alternative 5 Soil Excavation + Off-Site Disposal
THRESHOLD CRITERIA ¹					
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA ²					
Long-term effectiveness and permanence	NA	Somewhat effective	Effective	Highly effective and permanent	Highly effective and permanent
Criteria Score		2	3	5	5
Reduction of toxicity, mobility, or volume through treatment	NA	Does not reduce toxicity, mobility, or volume	Effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume
Criteria Score		1	3	2	2
Short-term effectiveness	NA	No impacts during implementation	Slight impacts during implementation	Significant impacts during implementation	Detrimental impacts during implementation
Criteria Score		5	4	2	1
Implementability	NA	Readily implementable	Implementable	Readily implementable	Easily implementable
Criteria Score		4	3	4	5
Cost (relative to other alternatives) ³	NA	\$0.28M/ \$0.28M/ \$0.28M	\$1.0M/ \$1.1M/ \$1.3M	\$6.7M/ \$14.9M/ \$19.6M	\$15.5M/ \$34.8M/ \$45.9M
Criteria Score		4	3	2	1
MODIFYING CRITERIA ⁴					
CERCLA Criteria - Alternative Total Score	NA	16	16	15	14
CERCLA Criteria - Alternative Rank	NA	1	2	3	4
OTHER CRITERIA ^{2,5}					
Sustainability ⁶	Highly sustainable	Highly sustainable	Moderately sustainable	Moderately sustainable	Somewhat sustainable

Notes:

1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criterion are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.

2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of these scales for each criterion are listed below.

Long-term effectiveness and permanence.

- 1 = Ineffective and temporary
- 2 = Somewhat effective
- 3 = Effective
- 4 = Highly effective
- 5 = Highly effective and permanent

Reduction of toxicity, mobility, or volume through treatment.

- 1 = Does not reduce toxicity, mobility, or volume
- 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
- 3 = Effective at reducing toxicity, mobility, and/or volume
- 4 = Highly effective at reducing toxicity, mobility, and/or volume
- 5 = Complete reduction of toxicity, mobility, and/or volume

Implementability.

- 1 = Very difficult to implement
- 2 = Difficult to implement
- 3 = Implementable
- 4 = Readily implementable
- 5 = Easily implementable

Cost (relative to other alternatives).

- Ranked by total net present value cost

Short-term effectiveness (impact to community, site workers, and environment).

- 1 = Detrimental impacts during implementation
- 2 = Significant impacts during implementation
- 3 = Minimal impacts during implementation
- 4 = Slight impact during implementation
- 5 = No impacts during implementation

- 3 Cost is present in millions of dollars. Three risk levels of cost are presented as E1-04/E1-05/E1-06. A full presentation of alternative costs can be found in Section 4 of the FS.
- 4 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS report and the proposed plan, and will be addressed in the ROD.
- 5 The Other Criterion, sustainability, is not required by CERCLA but it has been included for completeness.
- 6 The sustainability score development is presented in Table 4-3, evaluated on a scale of 1-25, with sustainability score range definitions below.

Sustainability Criterion Score.

- Ranked by sustainability evaluations presented in Section 4 of the FS,
 - 1-5 = Not sustainable
 - 6-10 = Potentially sustainable
 - 11-15 = Somewhat sustainable
 - 16-20 = Moderately sustainable
 - 21-25 = Highly sustainable

**Table 5 - Detailed Comparative Analysis
OU2 - B100**

Evaluation Criteria	OU2 Soil B100 Area Remedial Alternatives			
	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Soil Excavation + On-site Consolidation under Soil Cover	Alternative 4 Soil Excavation + Off-Site Disposal
THRESHOLD CRITERIA ¹				
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA ²				
Long-term effectiveness and permanence	NA	Somewhat effective	Highly effective and permanent	Highly effective and permanent
Criteria Score		2	5	5
Reduction of toxicity, mobility, or volume through treatment	NA	Does not reduce toxicity, mobility, or volume	Somewhat effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume
Criteria Score		1	2	2
Short-term effectiveness	NA	No impacts during implementation	Minimal impacts during implementation	Significant impacts during implementation
Criteria Score		5	3	2
Implementability	NA	Readily implementable	Readily implementable	Easily implementable
Criteria Score		4	4	5
Cost (relative to other alternatives) ³	NA	\$0.43M/ \$0.43M/ \$0.43M	\$3.1M/ \$3.2M/ \$4.0M	\$8.8M/ \$9.2M/ \$12.0M
Criteria Score		3	2	1
MODIFYING CRITERIA ⁴				
CERCLA Criteria - Alternative Total Score	NA	15	16	15
CERCLA Criteria - Alternative Rank		2	1	3
OTHER CRITERIA ^{2,5}				
Sustainability ⁶	Highly sustainable	Highly sustainable	Moderately sustainable	Somewhat sustainable

Notes

1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criterion are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.

2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of these scales for each criterion are listed below.

Long-term effectiveness and permanence

- 1 = Ineffective and temporary
- 2 = Somewhat effective
- 3 = Effective
- 4 = Highly effective
- 5 = Highly effective and permanent

Implementability

- 1 = Very difficult to implement
- 2 = Difficult to implement
- 3 = Implementable
- 4 = Readily implementable
- 5 = Easily implementable

Reduction of toxicity, mobility, or volume through treatment

- 1 = Does not reduce toxicity, mobility, or volume
- 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
- 3 = Ineffective at reducing toxicity, mobility, and/or volume
- 4 = Highly effective at reducing toxicity, mobility, and/or volume
- 5 = Complete reduction of toxicity, mobility, and/or volume

Short-term effectiveness (impact to community, site workers, and environment)

- 1 = Detrimental impacts during implementation
- 2 = Significant impacts during implementation
- 3 = Minimal impacts during implementation
- 4 = Slight impact during implementation
- 5 = No impacts during implementation

Cost (relative to other alternatives)

- Ranked by total net present value cost

Sustainability (relative to other alternatives)

- Ranked by sustainability evaluations presented in Section 4

- 3 Cost is present in millions of dollars. Three risk levels of cost are presented as IE-04/IE-05/IE-06. A full presentation of alternative costs can be found in Section 4 of the IS.
- 4 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the IS report and the proposed plan, and will be addressed in the ROD.
- 5 The Other Criterion, sustainability, is not required by CERCLA but it has been included for completeness.
- 6 The sustainability score development is presented in Table 4.3.1-3, evaluated on a scale of 1-25, with sustainability score range definitions below.

Sustainability Criterion Score (relative to other alternatives)

- Ranked by sustainability evaluations presented in Section 4

- 1-5 = Not sustainable
- 6-10 = Potentially sustainable
- 11-15 = Somewhat sustainable
- 16-20 = Moderately sustainable
- 21-25 = Highly sustainable

of the FS,

**Table 5 - Detailed Comparative Analysis
OU2 - RM**

Evaluation Criteria	OU2 Soil RM Area Remedial Alternatives				
	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Soil Excavation + On-site Consolidation under Soil Cover	Alternative 4 Soil Excavation + <i>Ex-Situ</i> Treatment by Soil Washing	Alternative 5 Soil Excavation + Off-Site Disposal
THRESHOLD CRITERIA ¹					
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA ²					
Long-term effectiveness and permanence	NA	Somewhat effective	Highly effective and permanent	Effective	Highly effective and permanent
Criteria Score		2	5	3	5
Reduction of toxicity, mobility, or volume through treatment	NA	Does not reduce toxicity, mobility, or volume	Somewhat effective at reducing toxicity, mobility, and/or volume	Highly effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume
Criteria Score		1	2	4	2
Short-term effectiveness	NA	No impacts during implementation	Minimal impacts during implementation	Minimal impacts during implementation	Significant impacts during implementation
Criteria Score		5	3	3	2
Implementability	NA	Readily implementable	Readily implementable	Implementable	Easily implementable
Criteria Score		4	4	3	5
Cost (relative to other alternatives) ³	NA	\$0.47M/ \$0.47M/ \$0.47M	\$3.2M/ \$3.6M/ \$4.5M	\$8.9M/ \$10.0M/ \$13.8M	\$6.3M/ \$7.3M/ \$9.6M
Criteria Score		4	3	1	2
MODIFYING CRITERIA ⁴					
CERCLA Criteria - Alternative Total Score	NA	16	17	14	16
CERCLA Criteria - Alternative Rank		3	1	4	2
OTHER CRITERIA ^{5,5}					
Sustainability ⁶	Highly sustainable	Highly sustainable	Moderately sustainable	Somewhat sustainable	Somewhat sustainable

Notes:

1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered a remedial action. Alternatives that fail either threshold criterion are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.

2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of these scales for each criterion are listed below.

Long-term effectiveness and permanence

- 1 = Ineffective and temporary
- 2 = Somewhat effective
- 3 = Effective
- 4 = Highly effective
- 5 = Highly effective and permanent

Reduction of toxicity, mobility, or volume through treatment

- 1 = Does not reduce toxicity, mobility, or volume
- 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
- 3 = Effective at reducing toxicity, mobility, and/or volume
- 4 = Highly effective at reducing toxicity, mobility, and/or volume
- 5 = Complete reduction of toxicity, mobility, and/or volume

Implementability

- 1 = Very difficult to implement
- 2 = Difficult to implement
- 3 = Implementable
- 4 = Readily implementable
- 5 = Easily implementable

Cost (relative to other alternatives)

- Ranked by total net present value cost

Sustainability (relative to other alternatives)

- Ranked by sustainability evaluations presented in Section 4

Short-term effectiveness (impact to community, site workers, and environment)

- 1 = Detrimental impacts during implementation
- 2 = Significant impacts during implementation
- 3 = Minimal impacts during implementation
- 4 = Slight impact during implementation
- 5 = No impacts during implementation

- 3 Cost is presented in millions of dollars. Three risk levels of cost are presented as E1-04/E1-05/E1-06. A full presentation of alternative costs can be found in Section 4 of the FS.
- 4 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the IS report and the proposed plan, and will be addressed in the ROD.
- 5 The Other Criterion, sustainability, is not required by CERCLA but it has been included for completeness.
- 6 The sustainability score development is presented in Table 4.3.2-1, evaluated on a scale of 1-25, with sustainability score range definitions below.

Sustainability Criterion Score (relative to other alternatives)

- Ranked by sustainability evaluations presented in Section 4

- 1-5 = Not sustainable
- 6-10 = Potentially sustainable
- 11-15 = Somewhat sustainable
- 16-20 = Moderately sustainable
- 21-25 = Highly sustainable

of the FS,

**Table 5 - Detailed Comparative Analysis
OU2 - RES Area**

Evaluation Criteria	OU2 Soil RES Area Remedial Alternatives			
	Alternative 1 No Action	Alternative 2 On-Site Soil Cover + Institutional Controls	Alternative 3 Soil Excavation + On-Site Consolidation under Soil Cover	Alternative 4 Soil Excavation + Off-Site Disposal
THRESHOLD CRITERIA ¹				
Overall protectiveness of human health and the environment	Fail	Pass	Pass	Pass
Compliance with ARARs	Fail	Pass	Pass	Pass
PRIMARY BALANCING CRITERIA ²				
Long-term effectiveness and permanence	NA	Somewhat effective	Highly effective and permanent	Highly effective and permanent
Criteria Score		2	5	5
Reduction of toxicity, mobility, or volume through treatment	NA	Somewhat effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume	Somewhat effective at reducing toxicity, mobility, and/or volume
Criteria Score		2	2	2
Short-term effectiveness	NA	Significant impacts during implementation	Significant impacts during implementation	Significant impacts during implementation
Criteria Score		2	2	2
Implementability	NA	Difficult to implement	Implementable	Implementable
Criteria Score		2	3	3
Cost (relative to other alternatives) ³	NA	\$107M/ \$128M/ \$128M	\$100M/ \$113M/ \$113M	\$139M/ \$157M/ \$157M
Criteria Score		2	3	1
MODIFYING CRITERIA ⁴				
CERCLA Criteria - Alternative Total Score	NA	10	15	13
CERCLA Criteria - Alternative Rank	NA	3	1	2
OTHER CRITERIA ^{2,5}				
Sustainability ⁶	NA	Somewhat sustainable	Moderately sustainable	Somewhat sustainable

Notes:

1 The Threshold Criteria have been evaluated on a pass/fail basis. An alternative must pass both threshold criteria in order to be considered as a remedial action. Alternatives that fail either threshold criterion are marked with not applicable (NA) for the remaining primary balancing, modifying, and other criteria.

2 The Primary Balancing Criteria have been evaluated on a scale of 1-5. Details on each of the scales for each criterion are listed below.

Long-term effectiveness and permanence

- 1 = Ineffective and temporary
- 2 = Somewhat effective
- 3 = Ineffective
- 4 = Highly effective
- 5 = Highly effective and permanent

Implementability

- 1 = Very difficult to implement
- 2 = Difficult to implement
- 3 = Implementable
- 4 = Readily implementable
- 5 = Easily implementable

Reduction of toxicity, mobility, or volume through treatment

- 1 = Does not reduce toxicity, mobility, or volume
- 2 = Somewhat effective at reducing toxicity, mobility, and/or volume
- 3 = Ineffective at reducing toxicity, mobility, and/or volume
- 4 = Highly effective at reducing toxicity, mobility, and/or volume
- 5 = Complete reduction of toxicity, mobility, and/or volume

Short-term effectiveness (impact to community, site workers, and environment)

- 1 = Detrimental impacts during implementation
- 2 = Significant impacts during implementation
- 3 = Minimal impacts during implementation
- 4 = Slight impact during implementation
- 5 = No impacts during implementation

Cost (relative to other alternatives)

- Ranked by total net present value cost

- 3 Cost is present in millions of dollars. Three risk levels of cost are presented as E1-04/E1-05/E1-06. A full presentation of alternative costs can be found in Section 4 of the FS.
- 4 The two Modifying Criteria, State acceptance and community acceptance, will be evaluated following comment on the FS report and the proposed plan, and will be addressed in the ROD.
- 5 The Other Criterion, sustainability, is not required by CERCLA but it has been included for completeness.
- 6 The sustainability score development is presented in Table 4.3.5-3, evaluated on a scale of 1-25, with sustainability score range definitions below.

Sustainability Criterion Score (relative to other alternatives)

- Ranked by sustainability evaluations presented in Section 4

- 1-5 = Not sustainable
- 6-10 = Potentially sustainable
- 11-15 = Somewhat sustainable
- 16-20 = Moderately sustainable
- 21-25 = Highly sustainable

of the FS,

Table 6

Detailed Cost Estimate of Selected Remedy

**OUI PLANT AREA ALT 6 SOIL COVER + INSTITUTIONAL CONTROLS + ACCESS RESTRICTIONS
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units	Cost Risk = 1E-05	Notes	Unit Cost Source
RFMED) CONSTRUCTION						
Preconstruction Activities						
Mobilization & Demobilization	\$250,000 LS		0.6	\$150,000		Prev. project experience
Construction Surveying	\$2,000 Day		3	\$6,000		Prev. project experience
Permits	\$18,000 LS		1	\$18,000		Prev. project experience
Contractor Prepared Preconstruction Plans						
HAASP	\$6,000 LS		1	\$6,000		Prev. project experience
SWPPP	\$15,000 LS		1	\$15,000		Prev. project experience
Traffic Plan	\$10,000 LS		1	\$10,000		Prev. project experience
Work Plan	\$8,000 LS		1	\$8,000		Prev. project experience
Sampling Plan	\$6,000 LS		1	\$6,000		Prev. project experience
Pre Design Sampling	\$8,000 LS		1	\$8,000		Prev. project experience
		Subtotal	1E-05 =	\$227,000		
Site Preparation & Access						
Construction Temporary Erosion & Sediment Controls	\$10,000 LS		1	\$10,000		Prev. project experience
Cleaning & Grubbing						
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		0.5	\$300		Prev. project experience
Perimeter Air Monitoring for Metals	\$15,000 Month		1.0	\$15,000		Prev. project experience
Decontamination Area Construction	\$10,000 LS		1	\$10,000	Incl mtg power and water	Prev. project experience
		Subtotal	1E-05 =	\$35,300		
Institutional Controls						
Deed Restrictions	\$30,000 LS		1	\$30,000		
Post-Remediation Groundwater Monitoring Wells	\$50,000 LS		1	\$50,000		
Institutional Control Monitoring Plan (ICMP)	\$5,000 LS		1	\$5,000		
		Subtotal	1E-05 =	\$85,000		
Property Access Restrictions						
Provide & Install New Security Fencing	\$48 Ft		1500	\$72,000		2010 RS Means
		Subtotal	1E-05 =	\$72,000		
Contaminated Soil Excavation and Backfilling						
Contaminated Soil Excavation & Temporary Stockpiling	\$6 Cu Yd		4000	\$24,000	Mix with Slag Pile	Prev. project experience
Confirmation Sampling & Analysis	\$2.68 Cu Yd		1500	\$4,000	Collect sample of excavated area for confirmation	Prev. project experience
		Subtotal	1E-05 =	\$28,000		
Capping/Cover/Liner						
Soil Cover 1.5 ft Compacted	\$25 Cu Yd		3000	\$75,000		2010 RS Means including Hauling
Low Permeability Asphalt Cover 2-in Base 3-in Surface	\$25 Sq Yd		4100	\$103,000		2010 RS Means including Hauling
Gravel Surface Place and Compact	\$23 Cu Yd		1,000	\$23,000		2010 RS Means including Hauling
		Subtotal	1E-05 =	\$201,000		
Site Restoration and Final Surveys						
Incidental Site Clean-up/Restoration	\$10,000.00 LS		1	\$10,000		Prev. project experience
Final Surveys	\$12,000.00 LS		0.5	\$6,000		Prev. project experience
		Subtotal	1E-05 =	\$16,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25,000 Month		1.0	\$25,000		Prev. project experience
Surveys As-Built	\$15,000.00 LS		0.5	\$8,000		Prev. project experience
Contractor Management and Oversight	\$40,000 Month		1.0	\$40,000		Prev. project experience
Contractor Sub Contracted Quality Control	\$10,000 Month		1.0	\$10,000		Prev. project experience
		Subtotal	1E-05 =	\$83,000		
		CONSTRUCTION SUBTOTAL	1E-05 =	\$747,300		
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Onsite Construction Quality Assurance	\$30,000 Month		1.0	\$30,000		Prev. project experience
Design, Permit Procurement, & Construction Management	20% of Construction Cost			\$149,000		Prev. project experience
Subcontractor Bond	3% of Construction Cost			\$22,000		
Construction Completion Report	\$40,000 LS		0.25	\$10,000		Prev. project experience
		ENGINEERING & CM SUBTOTAL	1E-05 =	\$211,000		
		CONSTRUCTION & ENGINEERING TOTAL	1E-05 =	\$958,300		
OPERATIONS AND MAINTENANCE						
Annual O&M	Years		5	\$21,000		
5 Year Remed. Reviews	Reviews		6	\$73,000		
Annual Institutional Control Inspection	Years		30	\$298,000		
		Net Present Value of O&M and Remed. Reviews (Interest Rate = 7%)	1E-05 =	\$392,000		
		TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST	1E-05 =	\$1,350,300		
CONTINGENCY						
Contingency	20% of Project Cost			\$270,000		
		TOTAL COST	1E-05 =	\$1,620,300		

**APPENDIX G-4-1 Table 9 Slag Pile Alt 6
BASIS FOR COST ESTIMATES**

**OUI SLAG PILE ALT 6 SOIL COVER + INSTITUTIONAL CONTROLS + ACCESS RESTRICTIONS
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No. of Units Risk = 1E-05	Cost
REMEDY CONSTRUCTION				
Preconstruction Activities				
Mobilization & Demobilization	\$250,000 LS		1	\$250,000
Construction Surveying	\$2,000 Day		5	\$10,000
Permits	\$18,000 LS		1	\$18,000
Contractor Prepared Preconstruction Plans				
HASP	\$6,000 LS		1	\$6,000
SWPPP	\$15,000 LS		1	\$15,000
Traffic Plan	\$10,000 LS		1	\$10,000
Work Plan	\$8,000 LS		1	\$8,000
Sampling Plan	\$6,000 LS		1	\$6,000
Pre Design Sampling	\$100,000 LS		1	\$100,000
			Subtotal	1E-05 = \$423,000
Site Preparation & Access				
Construction Temporary Erosion & Sediment Controls	\$10,000 LS		1	\$10,000
Cleaning & Grubbing				
Tree and Brush Removal High Density	\$1,250 10,000 Sq Ft		11	\$14,000
Tree and Brush Removal Medium Density	\$900 10,000 Sq Ft		39	\$34,000
Tree and Brush Removal Low Density	\$600 10,000 Sq Ft		39	\$23,000
Provide & Install Construction Fencing	\$18 LF		600	\$11,000
Decontamination Area Construction	\$10,000 LS		1	\$10,000
Access Roads	\$16 Sq Yd		3,900	\$59,000
Construction Water Management				
Construction Dewatering (GW & Surface Water)	\$40,000.00 LS		1	\$40,000
Perimeter Air Monitoring for Metals	\$15,000 Month		9	\$135,000
			Subtotal	1E-05 = \$337,000
Institutional Controls				
Deed Restrictions	\$30,000 LS		1	\$30,000
Post-Remediation Groundwater Monitoring Wells	\$50,000 LS		1	\$50,000
Institutional Control Monitoring Plan	\$5,000 LS		1	\$5,000
			Subtotal	1E-05 = \$85,000
Property Access Restrictions				
Provide & Install New Security Fencing	\$48 Ft		4,000	\$192,000
			Subtotal	1E-05 = \$192,000
Contaminated Soil Excavation and Backfilling				
Contaminated Soil Excavation & Temporary Stockpiling, Difficult Materials	\$9 Cu Yd		2,500	\$225,000
			Subtotal	1E-05 = \$225,000
Capping/Cover/Liner				
Soil Cover 1.5 ft, Compacted	\$25 Cu Yd		50,000	\$1,250,000
			Subtotal	1E-05 = \$1,250,000
Runoff Diversion & Erosion Control (Permanent)				
Swales-Excavation & Grading	\$2 Sq Yd		2,700	\$5,000
Erosion Control Mat (Slopes & Covers)	\$2 Sq Yd		91,700	\$183,000
Erosion Control Riprap-(Grad No 3 Quail B)	\$42 Cu Yd		360	\$15,000
Erosion Control Stone/Bedding (CA-2 or Grad No 1)	\$26 Cu Yd		240	\$6,000
			Subtotal	1E-05 = \$209,000
Surface Water Control Structures & Piping				
HDPE-Smooth Interior (18 in Type S)	\$21 Ft		150	\$3,000
			Subtotal	1E-05 = \$3,000
Building Demolition & Debris Removal				
Debris Removal, Rinsc & Offsite Disposal	\$120 Cu Yd		100	\$12,000
			Subtotal	1E-05 = \$12,000
Topsoil Cover & Revegetation				
Offsite Topsoil Borrow, Hauling, & Placement, 6-in	\$28 Cu Yd		17,000	\$476,000
Tree Planting (Assume 1 tree per 250 Sq Ft)	\$25 Tree Plug		3,700	\$93,000
Seeding	\$4,000 Acre		21	\$84,000
			Subtotal	1E-05 = \$653,000
Site Restoration and Final Surveys				
Incidental Site Clean-up/Restoration	\$10,000.00 LS		1	\$10,000
Final Surveys	\$12,000.00 LS		1	\$12,000
			Subtotal	1E-05 = \$22,000
Contractor's Oversight, H&S, Surveying				
Contractor Health and Safety	\$25,000 Month		9	\$225,000
Survey As-Built	\$15,000 LS		1	\$15,000
Contractor Management and Oversight	\$40,000 Month		9	\$360,000
Contractor Sub Contracted Quality Control	\$10,000 Month		9	\$90,000
			Subtotal	1E-05 = \$690,000
			CONSTRUCTION SUBTOTAL	1E-05 = \$4,100,000
ENGINEERING AND CONSTRUCTION MANAGEMENT				
Onsite Construction Quality Assurance	\$30,000 Month		9	\$270,000
Design, Engin Procurement & Construction Management	20% of Construction Cost			\$820,000
Subcontractor Bond	7% of Construction Cost			\$123,000
Construction Completion Report	\$40,000 LS		1	\$40,000
			ENGINEERING & CM SUBTOTAL	1E-05 = \$1,253,000
			CONSTRUCTION & ENGINEERING TOTAL	1E-05 = \$5,353,000
OPERATIONS AND MAINTENANCE				
Annual O&M		Years	30	\$182,000
5 Year Remed. Reviews		Reviews	6	\$73,000
Annual Institutional Control Inspection		Years	30	\$298,000
			Net Present Value of O&M and Remed. Reviews (Interest Rate = 7%)	1E-05 = \$553,000
			TOTAL CONSTRUCTION ENGINEERING AND O&M COST	1E-05 = \$5,906,000
CONTINGENCY				
Contingency	20% of Project Cost			\$1,181,000
			TOTAL COST	1E-05 = \$7,087,000

Incl. mt., power, and water

**OU1 ALT 15A SLOPING AND BENCHING + PLANTINGS + REVETMENTS AT THE TOE OF SLOPE + BMPS
WITH SOIL COVER OVER THE ENTIRETY OF THE SLAG PILE
MATTHIESSEN & BEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No. of Units	Cost	Notes	Unit Cost Source
REMEDY CONSTRUCTION						
Preconstruction Activities						
Submittal Analysis	\$18 000 L.S.		1	\$18 000		Prev project experience
Mobilization & Demobilization	\$250 000 L.S.		1	\$250 000		Prev project experience
Construction Surveying	\$2 000 Day		5	\$10 000		Prev project experience
Permits	\$18 000 L.S.		1	\$18 000		Prev project experience
Contractor Prepared Preconstruction Plans						
HASP	\$6 000 L.S.		1	\$6 000		Prev project experience
SWPPP	\$15 000 L.S.		1	\$15 000		Prev project experience
Traffic Plan	\$10 000 L.S.		1	\$10 000		Prev project experience
Work Plan	\$8 000 L.S.		1	\$8 000		Prev project experience
Pre Design Sampling	\$60,000 L.S.		1	\$60 000		Prev project experience
		Subtotal		\$395,000		
Site Preparation & Access						
Construction Temporary Erosion & Sediment Controls	\$10 000 L.S.		1	\$10 000		Prev project experience
Cleaning & Grubbing						
Tree and Brush Removal - High Density	\$1,250 10 000 Sq Ft		11	\$14 000		2010 RS Means & Experience
Tree and Brush Removal - Medium Density	\$900 10,000 Sq Ft		39	\$33 000		2010 RS Means & Experience
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		39	\$23 000		Prev project experience
Provide & Install Construction Fencing	\$18 L.F.		600	\$11 000		Prev project experience
Decontamination Area Construction	\$10 000 L.S.		1	\$10 000	Incl mtl power and water	Prev project experience
Access Roads	\$18 Sq Yd		3300	\$59 000		
Construction Water Management						
Construction Dewatering (GW & Surface Water)	\$40 000 L.S.		1	\$40 000		Prev project experience
Discharge Sampling & Analysis	\$5 000 Month		10	\$50 000		Quote from EQ Facility 9/2010
Perimeter Air Monitoring for Metals	\$15 000 Month		10	\$150 000		Prev project experience
		Subtotal		\$402,000		
Institutional Controls						
Deed Restrictions	\$30 000 L.S.		1	\$30 000		
Post-Remediation Groundwater Monitoring Wells	\$50 000 L.S.		1	\$50,000		
Institutional Control Monitoring Plan	\$5 000 L.S.		1	\$5 000		
		Subtotal		\$85,000		
Property Access Restrictions						
Provide & Install New Security Fencing	\$48 Ft		4000	\$192 000		2010 RS Means
		Subtotal		\$192,000		
Backfilling						
Backfill - Onsite Borrow Placement & Compaction	\$15 Cu Yd		183000	\$2 745 000	Includes analytical testing of material	Prev project experience
		Subtotal		\$2,745,000		
Cover/Liner						
Soil Cover 1.5 ft. Compacted	\$25 Cu Yd		50000	\$1,250 000		2010 RS Means including Hauling
Low permeability holding pond clay liner	\$28 Sq Yd		20000	\$560 000		Prev project experience
		Subtotal		\$1,810 000		
Slag Pile Slope Stabilization						
Slope Soil Excavation Benching & Stockpiling	\$16 Cu Yd		189000	\$3 024 000		Prev project experience
Retaining Wall-concrete up to 6 ft	\$275 L Ft		1600	\$440 000		2010 RS Means & Experience
Holding pond dewatering	\$45 000 Month		1	\$45 000		
Holding Pond Dredging	\$18 Cu Yd		20000	\$360 000		
		Subtotal		\$3,869 000		
Runoff Diversion & Erosion Control (Permanent)						
Swales-Excavation & Grading	\$2 Sq Yd		2700	\$5 000		Prev project experience
Erosion Control Mat (Slopes & Covers)	\$2 Sq Yd		119000	\$238 000		Prev project experience
Erosion Control Mat (Drainage Channels)	\$250 Sq Yd		720	\$2 000		Prev project experience
Erosion Control Riprap-Grad No. 3 Quailn. B)	\$42 Cu Yd		500	\$21 000		Prev project experience
Erosion Control Stone/Bedding (CA-2 or Grad No. 1)	\$26 Cu Yd		1000	\$26 000		Prev project experience
River Bank/Slag Toe Stabilization	\$45 Cu Yd		6000	\$270 000		Prev project experience
		Subtotal		\$562 000		
Surface Water Control Structures & Piping						
Surface Water Control Structures	\$40 000 L.S.		1	\$40 000		
RCP-ASTM C76 Class IV (30 in Dia)	\$103 Ft		250	\$26 000		2010 RS Means
HDPE Smooth Interior (18 in Type S)	\$21 Ft		150	\$3 000		
		Subtotal		\$69 000		
Building Demolition & Debris Removal						
Bld Structure Demolition-Concrete Footings	\$18 Sq Ft		144	\$3 000		2010 RS Means & Experience
Debris Removal - Ruble & Offsite Disposal	\$120 Cu Yd		150	\$18 000		Prev project experience
		Subtotal		\$21 000		
Topsoil Cover & Revegetation						
Offsite Topsoil Borrow Hauling & Placement, 6-in	\$28 Cu Yd		17000	\$476 000		Prev project experience
Tree Planting (Assume 1 tree per 250 Sq Ft)	\$25 Tree Plug		3700	\$93 000		Prev project experience
Seeding	\$4 000 Acre		21	\$84 000		Prev project experience
		Subtotal		\$653 000		
Site Restoration and Final Surveys						
Incidental Site Clean-up/Restoration	\$10 000 L.S.		1	\$10 000		Prev project experience
Final Survey	\$12 000 L.S.		1	\$12 000		Prev project experience
		Subtotal		\$22,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25 000 Month		10	\$250 000		Prev project experience
Survey As Built	\$15 000 L.S.		1	\$15 000		Prev project experience
Contractor Management and Oversight	\$40 000 Month		10	\$400 000		Prev project experience
Contractor Sub-Contracted Quality Control	\$10 000 Month		10	\$100 000		Prev project experience
		Subtotal		\$765 000		
		CONSTRUCTION SUBTOTAL		\$11,590 000		
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Ongoing Construction Quality Assurance	\$30 000 Month		10	\$300 000		Prev project experience
Design, Engin. Procurement & Construction Management	20% of Construction Cost			\$2 318 000		Prev project experience
Subcontractor Bond	3% of Construction Cost			\$348 000		Prev project experience
Construction Completion Report	\$40 000 L.S.		1	\$40 000		
		ENGINEERING & CM SUBTOTAL		\$3 006 000		
		CONSTRUCTION & ENGINEERING TOTAL		\$14 596 000		
OPERATIONS AND MAINTENANCE						
Annual O&M	Years		30	\$136 000		
5 Year Remedy Reviews	Reviews		6	\$73 000		
Annual Institutional Control Inspection	Years		30	\$298 000		
Net Present Value of O&M and Remedy Reviews (Interest Rate = 7%)				\$507 000		
		TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST		\$15,103 000		
CONTINGENCY						
Contingency	20% of Project Cost			\$3 021 000		
		TOTAL COST		\$18 124 000		

**OU2 SOIL MIA ALT 2: SOIL EXCAVATION + ON-SITE SOIL CONSOLIDATION UNDER A SOIL COVER + INSTITUTIONAL CONTROLS
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
REMEDY CONSTRUCTION						
Preconstruction Activities						
Mobilization & Demobilization	\$250,000 LS		1	\$250,000		Prev project experience
Construction Surveying	\$2,000 Day		21	\$42,000	Assume 3 ac/day for surveying	Prev project experience
Contractor Prepared Preconstruction Plans						
HASP	\$6,000 LS		1	\$6,000		Prev project experience
SWPPP Plan	\$15,000 LS		1	\$15,000		Prev project experience
Traffic Plan	\$10,000 LS		1	\$10,000		Prev project experience
Work Plan	\$8,000 LS		1	\$8,000		Prev project experience
Sampling Plan	\$6,000 LS		1	\$6,000		Prev project experience
Pre-Design Sampling	\$1,900 Acre		21	\$81,000	Pre-design sampling area shown on Figures 4.1-1 (surface) and 4.3-2 (subsurface)	
		Subtotal		1E-05 = \$418,000		
Site Preparation & Access						
Construction Temporary Erosion & Sediment Controls	\$10,000 LS		1	\$10,000		Prev project experience
Cleaning & Grubbing					Assume 5 ac/day for site clearing and grubbing	
Tree and Brush Removal - Medium Density	\$900 10,000 Sq Ft		15	\$13,500		2010 RS Means & Experience
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		132	\$79,200		Prev project experience
Provide & Install Construction Fencing	\$18 LF		8,546	\$154,000		Prev project experience
Decommissionation Area	\$10,000 LS		1	\$10,000	decommissionation area	
Access Roads	\$18 Sq Yd		11,000	\$198,000	Access road around MIA Area	Prev project experience
Construction Water Management						
Construction Dewatering (GW & Surface Water)	\$40,000 LS		1	\$40,000		Prev project experience
Treatment/Disposal	\$0.70 Gallon		7,250,311	\$2,175,000	Assume 2 feet of water need to be removed from open excavation	Quote from EQ Facility, 9/2010
Discharge Sampling & Analysis	\$5,000 Month		1	\$5,000	Monitoring will continue for duration of construction phase	
Perimeter Air Monitoring for Metals	\$31,460 Month		26	\$818,000		Prev project experience
		Subtotal		1E-05 = \$3,202,000		
Physical Hazard Removal						
Build/Structure Demolition-Concrete Footings	\$18.00 Sq Ft		52,430	\$944,000	Assume 12" thick concrete foundation	2010 RS Means & Experience
Build/Structure Demolition-Find not included	\$1.00 Cu Ft		824,673	\$825,000		2010 RS Means
Debris Removal & Onsite Consolidation	\$22.00 Cu Yd		27,952	\$615,000	Brick, concrete, ceramic, and wood material will be crushed and consolidated on-site	Prev project experience
Debris Removal, Rinse & Offsite Disposal	\$120.00 Cu Yd		1,232	\$148,000	Slag/sinter to be disposed of off-site	Prev project experience
Contaminated Water Disposal (hazardous)	\$0.80 gallon		2,206,709	\$1,765,000	Contaminated water will be collected and transported off-site for treatment/disposal	
Air Monitoring & Compliance Sampling	\$77,040 Month		1.2	\$92,000	Monitor air for metals, particulates, and asbestos	Prev project experience
Compliance Sampling & Analysis for Off-Site Disposal	\$1.84 Cu Yd		1,021	\$1,900		Prev project experience
Debris Removal, Rinse & Off-Site Recycling	\$62.30 Cu Yd		1,021	\$64,000	Metal will be sent to an off-site recycling facility	
On-Site Recycling Equipment Rental	\$58,355 Month		1	\$29,000	equipment used to crush brick, concrete, and ceramic materials before placing them in the on-site consolidation area or recycling the material on-site	
				1E-05 = \$4,483,900		
Institutional Controls						
Deed Restrictions	\$30,000 LS		1	\$30,000		
Institutional Control Monitoring Plan (ICMP)	\$5,000 ls		1	\$5,000		
		Subtotal		1E-05 = \$35,000		
Contaminated Soil Excavation and Backfilling						
Contaminated Soil Excavation & Temporary Stockpiling	\$6 Cu Yd		167,948	\$1,008,000	Assume 2000 cy/day for soil excavation	Prev project experience
Contaminated Soil Excavation & Temporary Stockpiling, Difficult Materials	\$9 Cu Yd		90,411	\$814,000	Assume 1000 cy/day for soil excavation	Prev project experience
Backfill - Offsite Borrow, Hauling, Placement & Compaction	\$10 Cu Yd		210,579	\$6,917,000	Includes analytical testing of material. Assume backfill rate of 3000 cy/day	Prev project experience
Confirmation Sampling & Analysis	\$2.68 Cu Yd		258,781	\$691,000	Collect sample of excavated area for confirmation	Prev project experience
		Subtotal		1E-05 = \$9,432,000		

**OU2 SOIL MIA ALT 2. SOIL EXCAVATION + ON-SITE SOIL CONSOLIDATION UNDER A SOIL COVER + INSTITUTIONAL CONTROLS
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
Contaminated Soil Consolidation or Disposal						
Onsite Hauling and Consolidation	\$45 Cu Yd		258.181	\$1,163,000		2010 RS Means & Experience
		Subtotal	1E-05 =	\$1,163,000		
Capping/Cover/Liner						
Low Permeability Clay Cover 2 ft Compacted	\$28 Cu Yd		18,068	\$452,000	Compacted clay material for area soil cover	2010 RS Means including Hauling
Geotextile Filter & Separator Fabric	\$3 Sq Yd		21,535	\$54,000	Geotextile liner used to excavated soil from soil cover material in MIA consolidation area	Prev project experience
		Subtotal	1E-05 =	\$506,000		
Runoff Diversion & Erosion Control (Permanent)						
Swales-Excavation & Grading	\$2 Sq Yd		1,017	\$2,000	Assumes 6-ft wide swales around perimeter and down slope on each side of consolidation area	
Erosion Control Mat (Slopes & Covers)	\$2 Sq Yd		20,499	\$41,000	Mat placed across entire consolidation area	
Erosion Control Mat (Drainage Channels)	\$1 Sq Yd		854	\$2,000	Assumes 6-ft wide channel at base of consolidation area around perimeter	
Erosion Control Riprap-(Grnd No 1 Quality B)	\$42 Cu Yd		284.60	\$12,000	Assume 1.0 ft of riprap in channel	
Erosion Control Stone/Bedding (CA-2 or Grnd No 1)	\$26 Cu Yd		284.60	\$7,000	Assume 1.0 ft of stone bedding in channel	
		Subtotal	1E-05 =	\$64,000		
Surface Water Control Structures & Piping						
Surface Water Control Structures	\$40,000 LS		1	\$40,000	All surface water control costs are included in the MIA Area (not divided by investigation area)	
HDPE-Smooth Interior (18 in Type 5)	\$21 Ft		1,000	\$21,000	Stormwater will be piped from site to the existing LaSalle stormwater system and to the LaSalle POTW	
		Subtotal	1E-05 =	\$61,000		
Topsoil Cover & Revegetation						
Offsite Topsoil Borrow Hauling & Placement	\$28 Cu Yd		31,798	\$890,000	Includes both topsoil for MIA Area (0.5 ft) and cover material for on-site consolidation area (1 ft)	Prev project experience
Tree Planting (Assume 1 tree per 250 Sq Ft)	\$25 Tree Plug		1,201	\$30,000	Assume 50 trees planted per day	Prev project experience
Seeding - Minimal slope on-site areas	\$1,000 Acre		19	\$19,000	Assume hydroseeding performed at 10 ac/day	
		Subtotal	1E-05 =	\$959,000	Includes seeding for both MIA Area overall and for on-site consolidation area	Prev project experience
Site Restoration and Final Survey						
Incidental Site Clean up/Restoration	\$10,000 LS		1	\$10,000		Prev project experience
Final Survey	\$12,000 LS		1	\$12,000		Prev project experience
		Subtotal	1E-05 =	\$22,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25,000 Month		26	\$650,000		Prev project experience
Survey As-Builts	\$15,000 LS		1	\$15,000		Prev project experience
Contractor Management and Oversight	\$40,000 Month		26	\$1,040,000		Prev project experience
Contractor Sub Contracted Quality Control	\$10,000 Month		26	\$260,000		Prev project experience
		Subtotal	1E-05 =	\$1,965,000		
CONSTRUCTION SUBTOTAL				1E-05 =	\$22,610,900	
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Onsite Construction Quality Assurance	\$10,000 Month		26	\$780,000		Prev project experience
Design, Engin. Procurement, & Construction Management	20% of Construction Cost			\$4,522,000		Prev project experience
Subcontractor Bond	3% of Construction Cost			\$678,000		
Construction Completion Report	\$40,000 LS		1	\$40,000		Prev project experience
		ENGINEERING & CM SUBTOTAL	1E-05 =	\$6,020,000		
CONSTRUCTION & ENGINEERING TOTAL				1E-05 =	\$28,630,900	
OPERATIONS AND MAINTENANCE						
Annual O&M		Years	30	\$330,000		
5 Year Remedy Reviews		Reviews	6	\$52,000		
		Net Present Value of O&M and Remedy Reviews (Interest Rate = 7%)	1E-05 =	\$382,000		
TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST				1E-05 =	\$29,012,900	
CONTINGENCY						
Contingency	20 % of Project Cost			\$5,801,000		
		TOTAL COST	1E-05 =	\$34,816,000		

**OU2 SOIL N ALT 4. SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
REMEDY CONSTRUCTION						
Preconstruction Activities						
Mobilization & Demobilization	\$150,000 LS		1	\$150,000		Prev project experience
Construction Surveying	\$2,000 Day		14	\$28,000	Assume 1 Ac/day for survey	Prev project experience
Contractor Prepared Preconstruction Plans						
HASP	\$6,000 LS		1	\$6,000		Prev project experience
SWPPP Plan	\$15,000 LS		1	\$15,000		Prev project experience
Traffic Plan	\$10,000 LS		1	\$10,000		Prev project experience
Work Plan	\$8,000 LS		1	\$8,000		Prev project experience
Sampling Plan	\$6,000 LS		1	\$6,000		Prev project experience
Pre-Design Sampling	\$3,900 Acre		0	\$0	Pre-design sampling area shown on Figures 4 3-1 (surface) and 4 3-2 (subsurface)	
		Subtotal	1E-05 =	\$223,000		
Site Preparation & Access						
Construction Temporary Erosion & Sediment Controls	\$10,000 LS		0	\$0		Prev project experience
Clearing & Grubbing						
Tree and Brush Removal - High Density	\$1,250 10,000 Sq Ft		27	\$34,000	Assume 1 Ac/day for site clearing and grubbing	2010 RS Means & Experience
Tree and Brush Removal - Medium Density	\$900 10,000 Sq Ft		16	\$15,000		2010 RS Means & Experience
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		11	\$7,000		Prev project experience
Provide & Install Construction Fencing	\$18 LF		3,259	\$59,000		Prev project experience
Decontamination Area						
Access Roads	\$10,000 LS		1	\$10,000	decontamination area	
Construction Water Management	\$18 Sq Yd		3,500	\$63,000	Access road around N Area	Prev project experience
Construction Dewatering (GW & Surface Water)						
Treatment/Disposal	\$40,000 LS		1	\$40,000		Prev project experience
Discharge Sampling & Analysis	\$0.30 Gallon		5,571,138	\$1,671,000	Assume 2 feet of water need to be removed from open excavation	Quote from EQ Facility, 9/2010
Perimeter Air Monitoring for Metals	\$5,000 Month		1	\$5,000	Monitoring will continue for duration of construction phase	Prev project experience
		Subtotal	1E-05 =	\$2,045,000		
Contaminated Soil Excavation and Backfilling						
Contaminated Soil Excavation & Temporary Stockpiling	\$6 Cu Yd		135,824	\$815,000	Assume 1000 cy/day for soil excavation	Prev project experience
Contaminated Soil Excavation & Temporary Stockpiling Difficult Materials	\$9 Cu Yd		15,092	\$136,000	Assume 2000 cy/day for soil excavation	Prev project experience
Backfill - Offsite Borrow, Hauling, Placement & Compaction						
Confirmation Sampling & Analysis	\$30 Cu Yd		140,854	\$4,226,000	Includes analytical testing of material. Assume backfill rate of 5000 cy/day	Prev project experience
	\$2.68 Cu Yd		150,916	\$405,000		Prev project experience
		Subtotal	1E-05 =	\$5,582,000		
Contaminated Soil Consolidation or Disposal						
Onsite Hauling and Consolidation	\$4.5 Cu Yd		150,916	\$679,000		2010 RS Means & Experience
		Subtotal	1E-05 =	\$679,000		
Capping/Cover/Liner						
Low Permeability Clay Cover 2 ft Compacted						
	\$28 Cu Yd		10,553	\$264,000	Compacted clay cover for on-site consolidation area soil cover	2010 RS Means including Hauling
Geotextile Filter & Separator Fabric						
	\$3 Sq Yd		12,578	\$31,000	Geotextile liner used to separate existing soil from consolidation area soil in M1A consolidation area	Prev project experience
		Subtotal	1E-05 =	\$295,000		

**OU2 SOIL N ALT 4 SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
Runoff Diversion & Erosion Control (Permanent)						
Swales-Excavation & Grading	\$2.00 Sq Yd		588	\$1,200	Assumes 6-ft wide swales around perimeter and down slope on each side of consolidation area	
Erosion Control Mat (Slopes & Covers)	\$2.00 Sq Yd		11,991	\$24,000	Mat placed across entire consolidation area cover	
Erosion Control Mat (Drainage Channels)	\$2.50 Sq Yd		484	\$1,200	Assumes 6-ft wide channel at base of consolidation area around perimeter	
Erosion Control Riprap-(Grad No. 3 Quality B)	\$42 Cu Yd		161	\$6,800	Assume 1.0 ft of riprap in channel	
Erosion Control Stone/Bedding (CA-2 or Grad No. 1)	\$26 Cu Yd		161	\$4,200	Assume 1.0 ft of stone bedding in channel	
			Subtotal	1E-05 = \$37,400		
Topsoil Cover & Revegetation						
Offsite Topsoil Borrow Hauling, & Placement	\$28 Cu Yd		12,396	\$347,000	Includes both topsoil for N Area (0.5 ft) and cover material for on-site consolidation area (1 ft)	Prev project experience
Tree Planting (Assume 1 tree per 250 Sq Ft)	\$25 Tree Plug		2,173	\$54,000	Assume 50 trees planted per day	Prev project experience
Seeding - Minimal slope on-site areas	\$1,000 Acre		15	\$15,000	Assume hydroseeding performed at 10 ac/day Includes seeding for both N Area and for on-site consolidation area	Prev project experience
			Subtotal	1E-05 = \$416,000		
Site Restoration and Final Survey						
Incidental Site Clean-up/Restoration	\$10,000 LS		1	\$10,000		Prev project experience
Final Survey	\$12,000 LS		1	\$12,000		Prev project experience
			Subtotal	1E-05 = \$22,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25,000 Month		7	\$175,000		Prev project experience
Survey As-Built	\$15,000 LS		1	\$15,000		Prev project experience
Contractor Management and Oversight	\$40,000 Month		7	\$280,000		Prev project experience
Contractor Sub Contracted Quality Control	\$10,000 Month		7	\$70,000		Prev project experience
			Subtotal	1E-05 = \$540,000		
			CONSTRUCTION SUBTOTAL	1E-05 = \$9,839,400		
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Onsite Construction Quality Assurance	\$30,000 Month		7	\$210,000		Prev project experience
Design, Engin., Procurement, & Construction Management	20% of Construction Cost			\$1,968,000		Prev project experience
Subcontractor Bond	3% of Construction Cost			\$295,000		
Construction Completion Report	\$40,000 LS		1	\$40,000		Prev project experience
			ENGINEERING & CM SUBTOTAL	1E-05 = \$2,513,000		
			CONSTRUCTION & ENGINEERING TOTAL	1E-05 = \$12,352,400		
OPERATIONS AND MAINTENANCE						
Annual O&M		Years	0	\$0		
5 Year Remedy Reviews		Reviews	6	\$52,000		
			Net Present Value of O&M and Remedy Reviews (Interest Rate = 7%)	1E-05 = \$52,000		
			TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST	1E-05 = \$12,404,400		
CONTINGENCY						
Contingency	20 % of Project Cost			\$2,481,000		
			TOTAL COST	1E-05 = \$14,885,400		

**OU2 SOIL B100 ALT 3 SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No. of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
REMEDY CONSTRUCTION						
Preconstruction Activities						
Mobilization & Demobilization	\$100,000 LS		1	\$100,000		Prev project experience
Construction Surveying	\$2,000 Day		3	\$6,000	Assume 3 Ac/day for survey	Prev project experience
Contractor Prepared Preconstruction Plans						
HAASP	\$6,000 LS		1	\$6,000		Prev project experience
SWPPP Plan	\$15,000 LS		1	\$15,000		Prev project experience
Traffic Plan	\$10,000 LS		1	\$10,000		Prev project experience
Work Plan	\$8,000 LS		1	\$8,000		Prev project experience
Sampling Plan	\$6,000 LS		1	\$6,000		Prev project experience
Pre-Design Sampling	\$3,900 Acre		2.5	\$10,000	Pre-design sampling area shown on Figures 4 3-1 (surface) and 4 3-2 (subsurface)	
		Subtotal	1E-05 =	\$161,000		
Site Preparation & Access						
Construction Temporary Erosion & Sediment Controls	\$10,000 LS		1	\$10,000		Prev project experience
Cleaning & Grubbing					Assume 5 Ac/day for site clearing and grubbing	
Tree and Brush Removal - High Density	\$1,250 10,000 Sq Ft		0.0	\$0		2010 RS Means & Experience
Tree and Brush Removal - Medium Density	\$900 10,000 Sq Ft		0.9	\$1,000		2010 RS Means & Experience
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		8.2	\$5,000		Prev project experience
Provide & Install Construction Fencing	\$18 LF		2,281	\$41,000		Prev project experience
Decontamination Area	\$10,000 LS		1	\$10,000	Includes materials, power, and water to operate decontamination area	
Access Roads	\$18 Sq Yd		1,500	\$27,000	Access road around B100 Area	Prev project experience
Construction Water Management						
Construction Dewatering (GW & Surface Water)	\$40,000 LS		1	\$40,000		Prev project experience
Treatment/Disposal	\$0.70 Gallon		388,738	\$117,000	Assume 2 feet of water need to be removed from open excavation	Quote from EQ Facility 9/2010
Discharge Sampling & Analysis	\$5,000 Month		1	\$5,000	Monitoring will continue for duration of construction phase	Prev project experience
Perimeter Air Monitoring for Metals	\$31,460 Month		4.0	\$126,000		Prev project experience
		Subtotal	1E-05 =	\$382,000		
Physical Hazard Removal						
Bld/Structure Demolition-Concrete Footings	\$18.00 Sq Ft		8,920	\$161,000	Assume 12" thick concrete foundation	2010 RS Means & Experience
Bld/Structure Demolition-nd not included	\$1.00 Cu Ft		64,415	\$64,000		2010 RS Means
Debris Removal & Onsite Consolidation	\$22.00 Cu Yd		1,892	\$42,000	Brick, concrete, ceramic and wood materials will be crushed and consolidated on-site	Prev project experience
Air Monitoring & Compliance Sampling	\$77,040 Month		0.3	\$19,000	Monitor air for metals, particulates, and asbestos	Prev project experience
Compliance Sampling & Analysis for Off Site Disposal	\$1.84 Cu Yd		5	\$0		Prev project experience
Debris Removal, Rinse & Off-Site Recycling	\$62.30 Cu Yd		5	\$0	Metal will be sent to an off-site recycling facility	
On-Site Recycling Equipment Rental	\$58,355 Month		0	\$12,000	equipment used to crush brick, concrete, and ceramic materials before placing them in the on-site consolidation area or recycling the material on-site	
		Subtotal	1E-05 =	\$298,000		
Contaminated Soil Excavation and Backfilling						
Contaminated Soil Excavation & Temporary Stockpiling	\$6 Cu Yd		12,947	\$78,000	Assume 2000 cy/day for soil excavation	Prev project experience
Contaminated Soil Excavation & Temporary Stockpiling - Difficult Materials	\$9 Cu Yd		4,316	\$19,000	Assume 1000 cy/day for soil excavation	Prev project experience
Backfill - Offsite Borrow Hauling, Placement & Compaction	\$30 Cu Yd		15,567	\$467,000	Includes analytical testing of material. Assume backfill rate of 5000 cy/day	Prev project experience
Confirmation Sampling & Analysis	\$2.68 Cu Yd		17,263	\$46,000	Collect sample of excavated area for confirmation	Prev project experience
		Subtotal	1E-05 =	\$630,000		
Contaminated Soil Consolidation or Disposal						
Onsite Hauling and Consolidation	\$4.5 Cu Yd		17,263	\$78,000		2010 RS Means & Experience
		Subtotal	1E-05 =	\$78,000		

**OU2 SOIL B100 ALT 3 SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No. of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
Capping/Cover/Liner						
Low Permeability Clay Cover, 2 ft, Compacted	\$28 Cu Yd		1 217	\$30,600	Backfill for on-site consolidation area soil cover	2010 RS Means including Hauling
Geotextile Filter & Separator Fabric	\$3 Sq Yd		1 451	\$4,000	Geotextile liner used to excavated soil from soil cover material in MIA consolidation area	Prev project experience
		Subtotal	1E-05 =	\$34,600		
Runoff Diversion & Erosion Control (Permanent)						
Swales-Excavation & Grading	\$2.00 Sq Yd		76	\$200	Assumes 6-ft wide swales around perimeter and down slope on each side of consolidation area	
Erosion Control Mat (Slopes & Covers)	\$2.00 Sq Yd		1,374	\$2,700	Mat placed across entire consolidation area cover	
Erosion Control Mat (Drainage Channels)	\$2.50 Sq Yd		61	\$200	Assumes 6-ft wide channel at base of consolidation area around perimeter	
Erosion Control Riprap-(Grad No. 1 Quality B)	\$42 Cu Yd		21	\$900	Assume 1.0 ft of riprap in channel	
Erosion Control Stone/Bedding (LA-2 or Grad No. 1)	\$26 Cu Yd		21	\$500	Assume 1.0 ft of stone bedding in channel	
		Subtotal	1E-05 =	\$4,500		
Topsoil Cover & Revegetation						
Offsite Topsoil Borrow Hauling & Placement	\$28 Cu Yd		1 965	\$55,000	Includes both topsoil for B100 Area (0.5 ft) and cover material for on-site consolidation area (1 ft)	Prev project experience
Tree Planting (Assume 1 tree per 250 Sq Ft)	\$25 Tree Plug		366	\$9,000	Assume 50 trees planted per day	Prev project experience
Seeding - Minimal slope on-site areas	\$1,000 Acre		2 4	\$2,000	Assume hydroseeding performed at 10 ac/day Includes seeding for both B100 Area properties and for on-site consolidation area	Prev project experience
		Subtotal	1E-05 =	\$66,000		
Site Restoration and Final Survey						
Incidental Site Clean-up/Restoration	\$10,000 LS		1	\$10,000		Prev project experience
Final Survey	\$12,000 LS		1	\$12,000		Prev project experience
		Subtotal	1E-05 =	\$22,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25,000 Month		4	\$100,000		Prev project experience
Survey As-Built's	\$15,000 LS		1	\$15,000		Prev project experience
Contractor Management and Oversight	\$40,000 Month		4	\$160,000		Prev project experience
Contractor Sub-Contracted Quality Control	\$10,000 Month		4	\$40,000		Prev project experience
		Subtotal	1E-05 =	\$315,000		
		CONSTRUCTION SUBTOTAL	1E-05 =	\$1,990,500		
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Onsite Construction Quality Assurance	\$30,000 Month		4	\$120,000		Prev project experience
Design Team Procurement & Construction Management	20% of Construction Cost			\$198,000		Prev project experience
Subcontractor Bond	3% of Construction Cost			\$60,000		
Construction Completion Report	\$40,000 LS		1	\$40,000		Prev project experience
		ENGINEERING & CM SUBTOTAL	1E-05 =	\$618,000		
		CONSTRUCTION & ENGINEERING TOTAL	1E-05 =	\$2,608,500		
OPERATIONS AND MAINTENANCE						
Annual O&M		Years	0	\$0		
5 Year Remedy Reviews		Reviews	6	\$52,000		
		Net Present Value of O&M and Remedy Reviews (Interest Rate = 7%)	1E-05 =	\$52,000		
		TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST	1E-05 =	\$2,660,500		
CONTINGENCY						
Contingency	20 % of Project Cost			\$532,000		
		TOTAL COST	1E-05 =	\$3,193,000		

APPENDIX S-6
BASIS FOR COST ESTIMATES
TABLE RM-3
OU2 SOIL RM ALT 3 SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATTHIESSEN & HEGELER ZINC COMPANY SITE

Cost Estimating Activity	Unit Cost	Units	No of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
RECONSTRUCTION						
Preconstruction Activities						
Mobilization & Demobilization	\$150,000 LS		1	\$150,000		Prev project experience
Construction Surveying	\$2,000 Day		4	\$8,000	Assume 1 ac/day for surveying	Prev project experience
Contractor Prepared Preconstruction Plans						
HAZOP	\$6,000 LS		1	\$6,000		Prev project experience
SWPPP Plan	\$15,000 LS		1	\$15,000		Prev project experience
Traffic Plan	\$10,000 LS		1	\$10,000		Prev project experience
Work Plan	\$8,000 LS		1	\$8,000		Prev project experience
Sampling Plan	\$6,000 LS		1	\$6,000		Prev project experience
Pre-Design Sampling	\$1,900 Acce	Subtotal	5	\$18,000	Pre-design sampling area shown on Figures 4.3-1 (surface) and 4.3-2 (subsurface)	
			1E-05 =	\$221,000		
Site Preparation & Access						
Construction Temporary Erosion & Sediment Controls	\$10,000 LS		1	\$10,000		Prev project experience
Clearing & Grubbing					Assume 5 Ac/day for site clearing and grubbing	
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		10	\$6,000		Prev project experience
Provide & Install Construction Fencing	\$18 LF		2,857	\$31,000		Prev project experience
Decommission Area	\$10,000 LS		1	\$10,000	Includes materials, power and water to operate decommission area	
Access Roads	\$18 Sq Yd		1500	\$27,000	Access road around RM Area	Prev project experience
Construction Water Management						
Construction Dewatering (GW & Surface Water)	\$40,000 00 LS		1	\$40,000		Prev project experience
Treatment/Disposal	\$0 20 Challen		523,997	\$17,000	Assume 2 feet of water need to be removed from open excavation	Quote from EQ Facility 9/2010
Discharge Sampling & Analysis	\$5,000 00 Month		1	\$5,000	Monitoring will continue for duration of construction phase	Prev project experience
Penetrate Air Monitoring for Metals	\$15,075 Month	Subtotal	3	\$45,000		Prev project experience
			1E-05 =	\$391,000		
Physical Hazard Removal						
BM Structure Demolition-Concrete Footings	\$18 00	Sq Ft	8,950	\$161,000	Assume 12" thick concrete foundation	2010 RS Means & Experience
BM Structure Demolition-Fnd not included	\$1 00	Cu Ft	164,121	\$164,000		2010 RS Means
Debris Removal & Onsite Consolidation	\$22 00	Cu Yd	5,223	\$115,000	Brick, concrete, ceramic and wood material will be crushed and consolidated on-site	Prev project experience
Air Monitoring & Compliance Sampling	\$77,040	Month	0.5	\$39,000	Molecular air for metals, particulates, and asbestos	Prev project experience
Compliance Sampling & Analysis for Off-Site Disposal	\$1.84	Cu Yd	1,187	\$2,200		Prev project experience
Debris Removal, Run & Off-Site Recycling	\$62.30	Cu Yd	1,187	\$74,000	Afficial will be sent to an off-site recycling facility	Prev project experience
On-Site Recycling Equipment Rental	\$58,355	Month	0	\$12,000	equipment used to crush brick, concrete and ceramic materials before placing them in the on-site consolidation area or recycling the material on site	
			1E-05 =	\$467,200		
Contaminated Soil Excavation and Backfilling						
Contaminated Soil Excavation & Temporary Stockpiling	\$6 Cu Yd		14,065	\$84,000	Assume 2000 cu/yd/day for soil excavation	Prev project experience
Contaminated Soil Excavation & Temporary Stockpiling, Difficult Materials	\$9 Cu Yd		4,688	\$42,000	Assume 1000 cu/yds for soil excavation includes analytical testing of material. Assume backfill rate of 5000 cu/yds	Prev project experience
Backfill - Onsite Borrow, Hauling, Placement & Compaction	\$10 Cu Yd		16,954	\$169,000	Collect sample of excavated area for confirmation	Prev project experience
Confirmation Sampling & Analysis	\$2.68 Cu Yd	Subtotal	18,753	\$50,000		Prev project experience
			1E-05 =	\$684,000		
Contaminated Soil Consolidation or Disposal						
Onsite Hauling and Consolidation	\$4.5 Cu Yd	Subtotal	18,753	\$84,000		2010 RS Means & Experience
			1E-05 =	\$84,000		
Capping/Cover/Liner						
Low Permeability Clay Cover 2 Ft Compacted	\$28 Cu Yd		1,111	\$31,000	Compacted clay for on-site consolidation area soil cover	2010 RS Means including Hauling
Geotextile Filter & Separator Fabric	\$1 Sq Yd	Subtotal	1,563	\$4,000	Nonwoven fabric liner used to separate existing soil from consolidation area soil in MHA consolidation area	Prev project experience
			1E-05 =	\$37,000		
Runoff Diversion & Erosion Control (Permanent)						
Swales-Excavation & Grading	\$2 Sq Yd		79	\$200	Assumes 6-ft wide swales around perimeter and down slope on each side of consolidation area	
Erosion Control Mat (Slopes & Covers)	\$2 Sq Yd		1,484	\$3,000	Mat placed across entire consolidation area cover	
Erosion Control Mat (Drainage Channels)	\$1 Sq Yd		65	\$200	Assumes 6-ft wide channel at base of consolidation area around perimeter	
Erosion Control Riprap (Urad No 3 Quality B)	\$42 Cu Yd		22	\$900	Assume 1 ft of riprap in channel	
Erosion Control Stone/Bedding (CA-2 or Urad No. 1)	\$26 Cu Yd		22	\$600	Assume 1 ft of stone bedding in channel	
		Subtotal	1E-05 =	\$4,900		

APPENDIX S-6
BASIS FOR COST ESTIMATES
TABLE RM-3
OU2 SOIL RM ALT 3 SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATTHIESSEN & HEGELER ZINC COMPANY SITE

Cost Estimating Activity	Unit Cost	Units	No. of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
Topsoil Cover & Revegetation						
Offsite Topsoil Burrow Hauling, & Placement	\$28 Cu Yd		2 089	\$58 000	Includes both topsoil for RM Area (0.5 ft) and cover material for on-site consolidation area (1 ft)	Prev. project experience
Tree Planting (Assume 1 tree per 250 Sq Ft)	\$25 Tree Plug		389	\$10,000		Assume 50 trees planted per day
					Assume hydroseeding performed at 10 ac/day	
Seeding - Minimal slope on-site areas	\$1 000 Acre		2.6	\$3 000	Includes seeding for both RM Area and for on-site consolidation area	Prev. project experience
		Subtotal	1E-05 =	\$71,000		
Site Restoration and Final Surveys						
Incidental Site Clean-up/Restoration	\$10 000 00 LS		1	\$10,000		Prev. project experience
Final Survey	\$12 000 00 LS		1	\$12,000		Prev. project experience
		Subtotal	1E-05 =	\$22,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25 000 Month		3	\$75 000		Prev. project experience
Survey As-Builts	\$15 000 LS		1	\$15,000		Prev. project experience
Contractor Management and Oversight	\$40 000 Month		3	\$120 000		Prev. project experience
Contractor Sub Contracted Quality Control	\$10 000 Month		3	\$30 000		Prev. project experience
		Subtotal	1E-05 =	\$240,000		
		CONSTRUCTION SUBTOTAL	1E-05 =	\$2,283,100		
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Onsite Construction Quality Assurance	\$30 000 Month		3	\$90 000		Prev. project experience
Design Origin, Procurement, & Construction Management	20% of Construction Cost			\$457 000		Prev. project experience
Subcontractor Bond	3% of Construction Cost			\$68 000		
Construction Completion Report	\$40 000 LS		1	\$40 000		Prev. project experience
		ENGINEERING & CM SUBTOTAL	1E-05 =	\$655,000		
		CONSTRUCTION & ENGINEERING TOTAL	1E-05 =	\$2,938,100		
OPERATIONS AND MAINTENANCE						
Annual O&M		Years	0	\$0		
5 Year Remedy Reviews		Reviews	6	\$52 000		
		Net Present Value of O&M and Remedy Reviews (Interest Rate = 7%)	1E-05 =	\$52,000		
		TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST	1E-05 =	\$2,990,100		
CONTINGENCY						
Contingency	20 % of Project Cost			\$598 000		
		TOTAL COST	1E-05 =	\$3,588,000		

**OU2 SOIL RES ALT 3- SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MAT THIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units Risk = 1E-05	Cost	Notes	Unit Cost Source
REMEDY CONSTRUCTION						
Preconstruction Activities						
Mobilization & Demobilization	\$250,000 LS		1	\$250,000		Prev project experience
Construction Surveying	\$2,000 Day		1,602	\$3,204,000	Assume 2 properties per day to be surveyed	Prev project experience
Contractor Prepared Preconstruction Plans						
HASP	\$6,000 LS		1	\$6,000		Prev project experience
SWPPP Plan	\$15,000 LS		1	\$15,000		Prev project experience
Traffic Plan	\$10,000 LS		1	\$10,000		Prev project experience
Work Plan	\$8,000 LS		1	\$8,000		Prev project experience
Sampling Plan	\$6,000 LS		1	\$6,000		Prev project experience
Pre-Design Sampling						
Pre-remedial soil sampling labor	\$84 15 hrs		19,072	\$1,609,000	Includes pre-field, field, post-field labor, and reporting for remaining 4768 properties in Res area of OU2. Assumes 4 hrs per property	
Coordination with Residents	\$150.00 property		4,579	\$1,603,000	Secure access agreements for pre-remedial sampling and remediation. Assume all 4574 unsampled OU2 off-site residential area properties require access agreements, assume 4 hours per property	
TCLP analysis (non CLP)	\$110.00 sample		5,495	\$604,000	Assume 15% of samples submitted for TCLP analysis	
Car/Gas	\$600.00 wk		38.1	\$23,000	Assume 4 FTE, 2 field teams, 10 hr/day, 2 hr/property sampled, for pre-remedial sampling labor	
Per diem (hotel/food)	\$156.00 day		38.1	\$60,000	Assume 4 FTE, 2 field teams, 10 hr/day, 2 hr/property sampled for pre-remedial sampling labor	
Materials/rent	\$120.00 wk		38.1	\$5,000	Includes XRF analyzer	
CLP Shipping	\$250.00 wk		38.1	\$10,000	Assumes 10% of samples shipped to CLP for confirmation analysis, approximately 5 coolers per week	
		Subtotal	1E-05 =	\$7,413,000		
Site Preparation & Access						
Clearing & Grubbing						
Tree and Brush Removal - Low Density	\$600 10,000 Sq Ft		1,139	\$683,000		Prev project experience
Decontamination Area						
Coordination with Residents	\$175 property		1,204	\$561,000	Includes materials, power, and water to operate decontamination area	Prev project experience
Perimeter Air Monitoring for Metals	\$31,460 Month		154	\$4,816,000	Assume air monitoring to be performed during excavation only. Excavation rate of 100 cy/day	Prev project experience
		Subtotal	1E-05 =	\$6,090,000		
Contaminated Soil Excavation and Backfilling						
Contaminated Soil Excavation & Temporary Stockpiling						
	\$6 Cu Yd		345,896	\$2,075,000	Assume 100 cy/day for soil excavation	Prev project experience
Backfill - Offsite Borrow, Hauling, Placement & Compaction						
Confirmation Sampling & Analysis	\$30 Cu Yd		210,912	\$6,327,000	Includes analytical testing of material. Assume backfill rate of 200 cy/day	Prev project experience
	\$2.68 Cu Yd		145,896	\$928,000	Collect sample of excavated area for confirmation	Prev project experience
		Subtotal	1E-05 =	\$9,330,000		
Contaminated Soil Consolidation or Disposal						
Onsite Hauling and Consolidation	\$4.5 Cu Yd		345,896	\$1,557,000	Soil transported to MIA Area for on-site consolidation	2010 RS Means & Experience
		Subtotal	1E-05 =	\$1,557,000		
Capping/Cover/Liner						
Low Permeability Clay Cover, 2 ft, Compacted						
	\$28 Cu Yd		25,914	\$648,000	Compacted clay for on-site consolidation area soil cover	
Geotextile Filter & Separator Fabric						
	\$1 Sq Yd		34,595	\$86,000	Geotextile liner used to separate existing soil from consolidation area soil in MIA consolidation area	
		Subtotal	1E-05 =	\$734,000		
Runoff Diversion & Erosion Control (Permanent)						
Swales-Excavation & Grading						
Erosion Control Mat (Slopes & Covers)	\$2.50 Sq Yd		1,670	\$4,100	Assumes 6-ft wide swales around perimeter and down slope on each side of consolidation area	
	\$42.00 Sq Yd		32,965	\$1,384,500	Mat placed across entire consolidation area cover	
Erosion Control Mat (Drainage Channels)						
	\$26.00 Sq Yd		1,343	\$34,900	Assumes 6-ft wide channel at base of consolidation area around perimeter	
Erosion Control Riprap-(Grnd No 3 Quality B)						
	\$45 Cu Yd		448	\$20,100	Assume 1.0 ft of riprap in channel	
Erosion Control Stone/Bedding (CA-2 or Grad No 1)	\$255 Cu Yd		448	\$114,100	Assume 1.0 ft of stone bedding in channel	
		Subtotal	1E-05 =	\$1,557,700		

**OU2 SOIL RES ALT 3- SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER
MATTHIESSEN & HEGELER ZINC COMPANY SITE**

Cost Estimating Activity	Unit Cost	Units	No of Units	Cost	Notes	Unit Cost Source
Topsoil Cover & Revegetation						
Offsite Topsoil Borrow, Hauling & Placement	\$28 Cu Yd		216 643	\$6,066,000	Includes both topsoil for residential properties (0.5 ft) and cover material for on-site consolidation area (1 ft) Residential properties will be sodded and landscaped Residential properties make up approximately 60% of the RES Area, based on square yards	Prev project experience
Sod and landscape - Residential Area	\$15.70 Sq Yd		759 281	\$11,921,000		
Seed and Inndscape - Residential Area	\$7.80 Sq Yd		506 189	\$3,948,000		
Seeding - On-site consolidation area	\$1,000 Acre		7	\$7,000	Assume hydroseeding performed at 8900 sq yd/day	Prev project experience
		Subtotal	1E-05 =	\$21,942,000		
Site Restoration and Final Survey						
Incidental Site Clean-up/Restoration	\$2,000 property		1,204	\$6,408,000	Includes 30 days of maintenance for each property Assume 2 properties per day to be surveyed	Prev project experience
Final Residential Survey	\$2,000 Day		1,602	\$3,204,000		
		Subtotal	1E-05 =	\$9,612,000		
Contractor's Oversight, H&S, Surveying						
Contractor Health and Safety	\$25,000 Month		177	\$4,425,000		Prev project experience
Survey As-Builts	\$15,000 LS		1	\$15,000		Prev project experience
Contractor Management and Oversight	\$40,000 Month		177	\$7,080,000		Prev project experience
Contractor Sub Contracted Quality Control	\$10,000 Month		177	\$1,770,000		Prev project experience
		Subtotal	1E-05 =	\$13,290,000		
CONSTRUCTION SUBTOTAL			1E-05 =	\$71,525,700		
ENGINEERING AND CONSTRUCTION MANAGEMENT						
Onsite Construction Quality Assurance	\$30,000 Month		177	\$5,310,000		Prev project experience
Design Engin Procurement & Construction Management	20% of Construction Cost			\$14,105,000		Prev project experience
Subcontractor Bond	3% of Construction Cost			\$2,146,000		
Construction Completion Report	\$40,000 LS		1	\$40,000		Prev project experience
		ENGINEERING & CM SUBTOTAL	1E-05 =	\$21,801,000		
CONSTRUCTION & ENGINEERING TOTAL			1E-05 =	\$93,326,700		
OPERATIONS AND MAINTENANCE						
Annual O&M		Years	0	\$0		
5 Year Remedy Reviews		Reviews	6	\$777,000		
		Net Present Value of O&M and Remedy Reviews (Interest Rate = 5%)	1E-05 =	\$777,000		
TOTAL CONSTRUCTION, ENGINEERING, AND O&M COST			1E-05 =	\$94,103,700		
CONTINGENCY						
Contingency	20 % of Project Cost			\$18,821,000		
		TOTAL COST	1E-05 =	\$112,925,000		

APPENDICES

APPENDIX 1

TABLE RA-G-2-1
HUMAN HEALTH RISK ASSESSMENT
TIER 1 RISK AND HAZARD SUMMARY
OPERABLE UNIT 1
Matthiessen and Hegeler Zinc Company Site, OU1 - LaSalle, Illinois

Exposure Area	Receptor	Exposure Media	Tier 1 RME Exposure Media Risk Estimates ⁽¹⁾		Tier 1 CTE Exposure Media Risk Estimates ⁽¹⁾	
			Cancer Risk	Non-Cancer HI	Cancer Risk	Non-Cancer HI
Carus Plant	Current Commercial/Industrial Worker	Surface Soil (0 to 2 ft bgs)	2.8E-05	2.8E+00	3.4E-06	1.4E+00
		Groundwater Vapors (Outdoor Air)	6.6E-14	2.1E-07	2.1E-14	1.9E-07
		Groundwater Vapors (Indoor Air)	6.3E-08	1.3E-01	2.0E-08	1.1E-01
		Total:	2.8E-05	3.0E+00	3.4E-06	1.5E+00
	Future Commercial/Industrial Worker	Subsurface Soil (0 to 10 ft bgs)	2.6E-05	1.3E+00	3.1E-06	5.8E-01
		Groundwater (Potable Use)	1.3E-04	6.5E+00	4.3E-05	5.7E+00
		Groundwater Vapors (Outdoor Air)	6.6E-14	2.1E-07	2.1E-14	1.9E-07
		Groundwater Vapors (Indoor Air)	6.3E-08	1.3E-01	2.0E-08	1.1E-01
		Total:	1.6E-04	7.9E+00	4.6E-05	6.4E+00
	Current and Future Utility Worker	Subsurface Soil (0 to 10 ft bgs)	7.1E-06	1.5E+00	3.9E-07	2.4E-01
		Shallow Groundwater (<10 ft bgs)	5.8E-06	5.5E-02	1.0E-06	2.7E-02
		Groundwater Vapors (Trench Air)	1.1E-06	2.2E+00	2.0E-07	1.1E+00
		Total:	1.4E-05	3.8E+00	1.6E-06	1.4E+00
	Future Construction Worker	Subsurface Soil (0 to 10 ft bgs)	9.3E-07	2.1E+01	1.3E-07	7.2E+00
		Shallow Groundwater (<10 ft bgs)	7.5E-07	7.2E-01	3.4E-07	7.0E-01
Groundwater Vapors (Trench Air)		1.5E-07	2.9E+01	6.7E-08	2.9E+01	
	Total:	1.8E-06	5.0E+01	5.4E-07	3.7E+01	
Hypothetical Future Resident	Surface Soil (0 to 2 ft bgs)	6.1E-04	1.3E+02	2.0E-04	6.3E+01	
	Subsurface Soil (0 to 10 ft bgs)	5.6E-04	5.7E+01	1.8E-04	2.8E+01	
	Groundwater (Potable Use)	8.7E-02	2.7E+03	2.0E-02	9.2E+02	
	Groundwater Vapors (Outdoor Air)	6.4E-13	8.9E-07	5.1E-14	1.1E-07	
	Groundwater Vapors (Indoor Air)	3.3E-06	2.1E+00	2.4E-06	2.1E+00	
	Total:	8.8E-02	2.8E+03	2.0E-02	9.8E+02	
Slag Pile	Future Commercial/Industrial Worker	Surface Soil (0 to 2 ft bgs)	8.2E-05	3.7E+00	1.1E-05	2.0E+00
		Subsurface Soil (0 to 10 ft bgs)	8.4E-05	3.5E+00	1.1E-05	1.9E+00
		Groundwater (Potable Use)	3.1E-04	8.6E+01	9.7E-05	7.6E+01
		Groundwater Vapors (Outdoor Air)	--	1.5E-08	--	1.4E-08
		Groundwater Vapors (Indoor Air)	--	7.3E-03	--	6.4E-03
		Total:	3.9E-04	9.0E+01	1.1E-04	7.8E+01
	Current and Future Site-Specific Worker	Surface Soil (0 to 2 ft bgs)	2.0E-05	8.8E-01	2.0E-06	3.0E-01
		Subsurface Soil (0 to 10 ft bgs)	2.0E-05	8.4E-01	2.0E-06	2.9E-01
		Groundwater Vapors (Outdoor Air)	--	3.7E-09	--	1.2E-09
		Total:	2.0E-05	8.8E-01	2.0E-06	3.0E-01
	Current and Future Utility Worker	Subsurface Soil (0 to 10 ft bgs)	4.0E-05	2.1E+00	2.2E-06	3.5E-01
		Shallow Groundwater (<10 ft bgs)	9.0E-07	1.6E-01	1.4E-07	7.7E-02
		Groundwater Vapors (Trench Air)	--	8.0E-02	--	4.0E-02
		Total:	4.1E-05	2.4E+00	2.4E-06	4.7E-01
	Future Construction Worker	Subsurface Soil (0 to 10 ft bgs)	5.2E-06	3.1E+01	7.4E-07	1.2E+01
Shallow Groundwater (<10 ft bgs)		1.2E-07	2.1E+00	4.6E-08	2.0E+00	
Groundwater Vapors (Trench Air)		--	1.0E+00	--	1.0E+00	
	Total:	5.3E-06	3.4E+01	7.8E-07	1.5E+01	
Current Adolescent Trespasser	Surface Soil (0 to 2 ft bgs)	1.2E-06	1.1E-01	1.9E-07	3.3E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	1.2E-06	1.1E-01	1.9E-07	3.3E-02	
Current Adult Trespasser	Surface Soil (0 to 2 ft bgs)	3.6E-06	9.9E-02	1.7E-07	3.3E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	3.6E-06	9.9E-02	1.7E-07	3.3E-02	
Future Child Recreationalist	Subsurface Soil (0 to 10 ft bgs)	7.2E-06	6.8E-01	1.3E-06	1.6E-01	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	7.2E-06	6.8E-01	1.3E-06	1.6E-01	
Future Adolescent Recreationalist	Subsurface Soil (0 to 10 ft bgs)	1.4E-06	1.0E-01	2.1E-07	3.1E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	1.4E-06	1.0E-01	2.1E-07	3.1E-02	
Future Adult Recreationalist	Subsurface Soil (0 to 10 ft bgs)	3.8E-06	9.5E-02	1.7E-07	3.2E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	3.8E-06	9.5E-02	1.7E-07	3.2E-02	
Little Vermilion River	Current and Future Adolescent Angler	Sediment	6.6E-07	3.1E-02	2.6E-07	1.1E-02
		Surface Water	1.8E-07	3.4E-02	8.4E-08	1.6E-02
		Total:	8.4E-07	6.5E-02	3.5E-07	2.7E-02
	Current and Future Adult Angler	Sediment	2.0E-06	3.5E-02	2.4E-07	1.3E-02
		Surface Water	2.0E-07	3.4E-02	2.8E-08	1.6E-02
		Total:	2.2E-06	6.9E-02	2.7E-07	2.9E-02
Current and Future Child Fish Consumer	Fish Fillets	8.3E-07	2.1E+00	1.5E-07	3.8E-01	
Current and Future Adolescent Fish Consumer	Fish Fillets	9.6E-07	7.2E-01	1.8E-07	1.3E-01	
Current and Future Adult Fish Consumer	Fish Fillets	3.7E-06	9.2E-01	3.5E-07	3.0E-01	

Notes:

(1) Risk and hazard estimates were calculated based on 3 tiers, which varied based on the assumed relative bioavailability (RBA) of arsenic. The following RBAs were used for arsenic:

- Tier 1 - 100%
- Tier 2 - 80%
- Tier 3 - 14% (Slag Pile only)

(2) Tier 1 risk calculation supporting tables are provided in Appendix RA-G6.

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HI = Hazard Index

ft bgs = feet below ground surface

"--" = not applicable

Orange Shading = Cancer risk greater than 1E-4

Yellow Shading = Cancer risk greater than 1E-6 or non-cancer hazard index greater than 1.

TABLE RA-G-2-2.1
HUMAN HEALTH RISK ASSESSMENT
TIER 2 RISK AND HAZARD SUMMARY
OPERABLE UNIT 1
Matthiessen and Hegeler Zinc Company Site, OU1 - LaSalle, Illinois

Exposure Area	Receptor	Exposure Media	Tier 2 RME Exposure Media Risk Estimates ⁽¹⁾		Tier 2 CTE Exposure Media Risk Estimates ⁽¹⁾	
			Cancer Risk	Non-Cancer HI	Cancer Risk	Non-Cancer HI
Carus Plant	Current Commercial/Industrial Worker	Surface Soil (0 to 2 ft bgs)	2.6E-05	2.8E+00	3.0E-06	1.4E+00
		Groundwater Vapors (Outdoor Air)	6.6E-14	2.1E-07	2.1E-14	1.9E-07
		Groundwater Vapors (Indoor Air)	6.3E-08	1.3E-01	2.0E-08	1.1E-01
		Total:	2.6E-05	2.9E+00	3.1E-06	1.5E+00
	Future Commercial/Industrial Worker	Subsurface Soil (0 to 10 ft bgs)	2.4E-05	1.3E+00	2.8E-06	5.8E-01
		Groundwater (Potable Use)	1.3E-04	6.5E+00	4.3E-05	5.7E+00
		Groundwater Vapors (Outdoor Air)	6.6E-14	2.1E-07	2.1E-14	1.9E-07
		Total:	1.6E-04	7.9E+00	4.5E-05	6.4E+00
	Current and Future Utility Worker	Subsurface Soil (0 to 10 ft bgs)	6.4E-06	1.5E+00	3.5E-07	2.4E-01
		Shallow Groundwater (<10 ft bgs)	5.8E-06	5.5E-02	1.0E-06	2.7E-02
		Groundwater Vapors (Trench Air)	1.1E-06	2.2E+00	2.0E-07	1.1E+00
		Total:	1.3E-05	3.7E+00	1.6E-06	1.4E+00
	Future Construction Worker	Subsurface Soil (0 to 10 ft bgs)	8.3E-07	2.0E+01	1.2E-07	7.2E+00
		Shallow Groundwater (<10 ft bgs)	7.5E-07	7.2E-01	3.4E-07	7.0E-01
		Groundwater Vapors (Trench Air)	1.5E-07	2.9E+01	6.7E-08	2.9E+01
		Total:	1.7E-06	5.0E+01	5.3E-07	3.7E+01
	Hypothetical Future Resident	Surface Soil (0 to 2 ft bgs)	6.0E-04	1.3E+02	2.0E-04	6.3E+01
		Subsurface Soil (0 to 10 ft bgs)	5.5E-04	5.6E+01	1.8E-04	2.8E+01
Groundwater (Potable Use)		8.7E-02	2.7E+03	2.0E-02	9.2E+02	
Groundwater Vapors (Outdoor Air)		6.4E-13	8.9E-07	5.1E-14	1.1E-07	
Groundwater Vapors (Indoor Air)		3.3E-06	2.1E+00	2.4E-06	2.1E+00	
	Total:	8.8E-02	2.8E+03	2.0E-02	9.8E+02	
Slag Pile	Future Commercial/Industrial Worker	Surface Soil (0 to 2 ft bgs)	7.0E-05	3.6E+00	9.1E-06	2.0E+00
		Subsurface Soil (0 to 10 ft bgs)	7.2E-05	3.4E+00	9.3E-06	1.9E+00
		Groundwater (Potable Use)	3.1E-04	8.6E+01	9.7E-05	7.6E+01
		Groundwater Vapors (Outdoor Air)	--	1.5E-08	--	1.4E-08
		Groundwater Vapors (Indoor Air)	--	7.3E-03	--	6.4E-03
		Total:	3.8E-04	9.0E+01	1.1E-04	7.8E+01
	Current and Future Site-Specific Worker	Surface Soil (0 to 2 ft bgs)	1.7E-05	8.6E-01	1.6E-06	3.0E-01
		Subsurface Soil (0 to 10 ft bgs)	1.7E-05	8.3E-01	1.6E-06	2.8E-01
		Groundwater Vapors (Outdoor Air)	--	3.7E-09	--	1.2E-09
		Total:	1.7E-05	8.6E-01	1.6E-06	3.0E-01
	Current and Future Utility Worker	Subsurface Soil (0 to 10 ft bgs)	3.3E-05	2.1E+00	1.8E-06	3.5E-01
		Shallow Groundwater (<10 ft bgs)	9.0E-07	1.6E-01	1.4E-07	7.7E-02
		Groundwater Vapors (Trench Air)	--	8.0E-02	--	4.0E-02
		Total:	3.4E-05	2.3E+00	2.0E-06	4.6E-01
	Future Construction Worker	Subsurface Soil (0 to 10 ft bgs)	4.3E-06	3.1E+01	6.1E-07	1.2E+01
		Shallow Groundwater (<10 ft bgs)	1.2E-07	2.1E+00	4.6E-08	2.0E+00
		Groundwater Vapors (Trench Air)	--	1.0E+00	--	1.0E+00
		Total:	4.4E-06	3.4E+01	6.6E-07	1.5E+01
Current Adolescent Trespasser	Surface Soil (0 to 2 ft bgs)	1.1E-06	1.1E-01	1.7E-07	3.2E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	1.1E-06	1.1E-01	1.7E-07	3.2E-02	
Current Adult Trespasser	Surface Soil (0 to 2 ft bgs)	3.3E-06	9.7E-02	1.4E-07	3.3E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	3.3E-06	9.7E-02	1.4E-07	3.3E-02	
Future Child Recreationalist	Subsurface Soil (0 to 10 ft bgs)	6.6E-06	6.6E-01	1.1E-06	1.6E-01	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	6.6E-06	6.6E-01	1.1E-06	1.6E-01	
Future Adolescent Recreationalist	Subsurface Soil (0 to 10 ft bgs)	1.3E-06	1.0E-01	1.8E-07	3.1E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	1.3E-06	1.0E-01	1.8E-07	3.1E-02	
Future Adult Recreationalist	Subsurface Soil (0 to 10 ft bgs)	3.4E-06	9.3E-02	1.5E-07	3.1E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	3.4E-06	9.3E-02	1.5E-07	3.1E-02	
Little Vermilion River	Current and Future Adolescent Angler	Sediment	6.2E-07	3.0E-02	2.5E-07	1.1E-02
		Surface Water	1.8E-07	3.4E-02	8.4E-08	1.6E-02
		Total:	8.0E-07	6.4E-02	3.4E-07	2.7E-02
	Current and Future Adult Angler	Sediment	1.9E-06	3.5E-02	2.4E-07	1.3E-02
		Surface Water	2.0E-07	3.4E-02	2.8E-08	1.6E-02
		Total:	2.1E-06	6.8E-02	2.6E-07	2.9E-02
Current and Future Child Fish Consumer	Fish Fillets	8.3E-07	2.1E+00	1.5E-07	3.8E-01	
Current and Future Adolescent Fish Consumer	Fish Fillets	9.6E-07	7.2E-01	1.8E-07	1.3E-01	
Current and Future Adult Fish Consumer	Fish Fillets	3.7E-06	9.2E-01	3.5E-07	3.0E-01	

Notes:

(1) Risk and hazard estimates were calculated based on 3 tiers, which varied based on the assumed relative bioavailability (RBA) of arsenic. The following RBAs were used for arsenic:

- Tier 1 - 100%
- Tier 2 - 80%
- Tier 3 - 14% (Slag Pile only)

(2) Tier 2 risk calculation supporting tables are provided in Appendix RA-G1 (RAGS Part D Tables).

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HI = Hazard Index

ft bgs = feet below ground surface

"--" = not applicable

Orange Shading = Cancer risk greater than 1E-4

Yellow Shading = Cancer risk greater than 1E-6 or non-cancer hazard index greater than 1.

TABLE RA-C-2-2.3
 HUMAN HEALTH RISK ASSESSMENT
 TIER 2 COC SUMMARY
 OUI, SLAG PILE
 Matthesian and Hegeler Zinc Company Site, OUI - LaSalle, Illinois

Exposure Area	Receptor	Exposure Media	Tier 2 RME Exposure Media Risk Estimates ⁽¹⁾			Tier 2 CTE Exposure Media Risk Estimates ⁽¹⁾				
			Cancer Risk	COCs ⁽²⁾	Non-Cancer HI	Cancer Risk	COCs ⁽²⁾	Non-Cancer HI		
Slag Pile	Future Commercial/Industrial Worker	Surface Soil (0 to 2 ft bgs)	7.0E-05	As (6.1E-5) Hx (6.8E-6)	3.0E+00	9.1E-06	As (8.1E-6)	2.0E+00	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.47)	
		Subsurface Soil (0 to 10 ft bgs)	7.2E-05	As (6.1E-5) Bz (1.8E-6) Hx (6.8E-6)	3.4E+00	9.3E-06	As (8.1E-6)	1.9E+00	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.44)	
	Current and Future Site-Specific Worker	Groundwater (Potable Use)	3.1E-04	As (3.0E-4) Cr (7.1E-6)	8.6E+01	9.7E-05	As (9.5E-5) Cr (2.2E-6)	7.6E+01	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.44)	
		Groundwater Vapors (Outdoor Air) Groundwater Vapors (Indoor Air)	3.8E-04	As (1.5E-05) Hx (1.6E-6)	8.9E+01	1.1E-04	As (1.4E-06)	7.8E+01	As (0.16) Co (0.38) Ld (n/a) Mn (1.0) Pb (0.47)	
	Current and Future Utility Worker	Surface Soil (0 to 2 ft bgs)	1.7E-05	As (1.5E-05) Hx (1.6E-6)	8.6E-01	1.6E-06	As (1.4E-06)	3.0E-01	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.47)	
		Subsurface Soil (0 to 10 ft bgs)	1.7E-05	As (1.5E-05) Hx (1.6E-6)	8.3E-01	1.6E-06	As (1.3E-06)	2.8E-01	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.47)	
	Future Construction Worker	Groundwater Vapors (Outdoor Air)	1.7E-05	As (3.1E-05) Hx (1.4E-6)	8.8E-01	1.8E-06	As (1.7E-06)	3.0E-01	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.47)	
		Shallow Groundwater (<10 ft bgs) Groundwater Vapors (Trench Air)	9.0E-07	As (3.1E-05) Hx (1.4E-6)	1.6E-01	1.4E-07	As (1.7E-06)	7.7E-02	As (0.14) Co (0.15) Ld (n/a) Mn (1.0) Pb (0.47)	
	Future Construction Worker	Future Construction Worker	Surface Soil (0 to 2 ft bgs)	4.3E-06	As (4.0E-6)	3.1E+01	6.1E-07	As (1.7E-06)	1.2E-01	As (0.77) Co (0.94) Ld (n/a) Mn (6.0) Pb (3.3)
			Subsurface Soil (0 to 10 ft bgs)	4.3E-06	As (4.0E-6)	3.1E+01	6.1E-07	As (1.7E-06)	1.2E-01	As (0.77) Co (0.94) Ld (n/a) Mn (6.0) Pb (3.3)
Current Adolescent Trespasser		Shallow Groundwater (<10 ft bgs)	1.2E-07	Al (0.12) As (0.26) Cu (0.10) Cr (0.69) Co (3.1) Fe (0.29) Ld (n/a) Mn (3.4) Ni (0.61) Zn (0.90)	2.1E+00	4.6E-08	Mn (1.9) Pb (1.0)	2.0E+00	Mn (1.9) Pb (1.0)	
		Groundwater Vapors (Trench Air)	3.4E-07	Al (0.12) As (0.26) Cu (0.10) Cr (0.69) Co (3.1) Fe (0.29) Ld (n/a) Mn (3.4) Ni (0.61) Zn (0.90)	1.0E+00	8.6E-07	As (1.7E-06)	1.6E+01	As (1.6) Co (3.3) Ld (n/a) Mn (6.0) Pb (3.3)	
Current Adult Trespasser		Surface Soil (0 to 2 ft bgs)	1.1E-05	As (1.1E-05)	1.1E+01	1.7E-07	As (1.1E-05)	3.2E-02	As (1.1E-05)	
		Subsurface Soil (0 to 2 ft bgs)	1.1E-05	As (1.1E-05)	1.1E+01	1.7E-07	As (1.1E-05)	3.2E-02	As (1.1E-05)	
Future Child Recreationalist		Surface Soil (0 to 2 ft bgs)	3.3E-06	As (2.8E-6)	9.7E+02	1.4E-07	As (2.8E-6)	3.3E-02	As (2.8E-6)	
		Groundwater Vapors (Outdoor Air)	3.3E-06	As (2.8E-6)	9.7E+02	1.4E-07	As (2.8E-6)	3.3E-02	As (2.8E-6)	
Future Adolescent Recreationalist		Subsurface Soil (0 to 10 ft bgs)	6.6E-06	As (4.4E-6)	6.6E+01	1.1E-06	As (4.4E-6)	1.6E-01	As (4.4E-6)	
		Groundwater Vapors (Outdoor Air)	6.6E-06	As (4.4E-6)	6.6E+01	1.1E-06	As (4.4E-6)	1.6E-01	As (4.4E-6)	
Future Adult Recreationalist	Subsurface Soil (0 to 10 ft bgs)	1.3E-06	As (2.8E-6)	1.0E+01	3.1E-07	As (2.8E-6)	3.1E-02	As (2.8E-6)		
	Groundwater Vapors (Outdoor Air)	3.4E-06	As (2.8E-6)	9.3E+02	1.5E-07	As (2.8E-6)	3.1E-02	As (2.8E-6)		
Future Adult Recreationalist	Subsurface Soil (0 to 10 ft bgs)	3.4E-06	As (2.8E-6)	9.3E+02	1.5E-07	As (2.8E-6)	3.1E-02	As (2.8E-6)		
	Groundwater Vapors (Outdoor Air)	3.4E-06	As (2.8E-6)	9.3E+02	1.5E-07	As (2.8E-6)	3.1E-02	As (2.8E-6)		

Notes:
 (1) Risk and hazard estimates were calculated based on 3 years, which varied based on the assumed relative bioavailability (RBA) of arsenic. The following RBAs were used for arsenic:
 Tier 1 = 100%
 Tier 2 = 80%
 Tier 3 = 14% (Slag Pile only)
 (2) Constituents of concern (COCs) are constituents with a cancer risk greater than 1E-6 or a non-cancer hazard index (HI) greater than 0.1 that contributes to a target organ HI greater than 1.
 RME = Reasonable Maximum Exposure
 HI = Hazard Index
 bgs = feet below ground surface
 "n/a" = not applicable
 Orange Shading = Cancer risk greater than 1E-4
 Yellow Shading = Cancer risk greater than 1E-6 or non-cancer hazard index greater than 1.

TABLE RA-G-2-2.4
HUMAN HEALTH RISK ASSESSMENT
TIER 2 COC SUMMARY
OU 1: LITTLE VERMILION RIVER
Mathiessen and Hegeler Zinc Company Site, OU 1 - LaSalle, Illinois

Exposure Area	Receptor	Exposure Media	Tier 2 RME Exposure Media Risk Estimates ⁽¹⁾				Tier 2 CTE Exposure Media Risk Estimates ⁽¹⁾			
			Cancer Risk	COCs ⁽²⁾	Non-Cancer HI	COCs ⁽²⁾	Cancer Risk	COCs ⁽²⁾	Non-Cancer HI	COCs ⁽²⁾
Little Vermillion River	Current and Future Adolescent Angler	Sediment	6.2E-07	-	3.0E-02	-	2.5E-07	-	1.1E-02	-
		Surface Water	1.8E-07	-	3.4E-02	-	8.4E-08	-	1.9E-02	-
		Total	8.0E-07		6.4E-02		3.4E-07		2.7E-02	
		Sediment	1.9E-06	• Arsenic (1.4E6)	3.5E-02	-	2.4E-07	-	1.3E-02	-
		Surface Water	2.0E-07	-	3.4E-02	-	2.8E-08	-	1.6E-02	-
	Current and Future Adult Angler	Total	2.1E-06		6.8E-02		2.6E-07		2.9E-02	
		Current and Future Child Fish Consumer	8.3E-07	-	2.1E+00	• Mercury (2.0)	1.5E-07	-	3.8E-01	-
		Current and Future Adolescent Fish Consumer	9.6E-07	-	7.2E-01	-	1.8E-07	-	1.3E-01	-
		Current and Future Adult Fish Consumer	3.7E-06	• Arsenic (3.7E6)	9.2E-01	-	3.5E-07	-	3.0E-01	-
		Total								

Notes:

(1) Risk and hazard estimates were calculated based on 3 tiers, which varied based on the assumed relative bioavailability (RBA) of arsenic. The following RBAs were used for arsenic:

Tier 1 - 100%

Tier 2 - 80%

Tier 3 - 14% (Sag Pile only)

(2) Constituents of concern (COCs) are constituents with a cancer risk greater than 1E-6 or a non-cancer hazard index (HI) greater than 0.1 that contributes to a target organ HI greater than 1.

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HI = Hazard Index

ft bgs = feet below ground surface

- = not applicable

Orange Shading = Cancer risk greater than 1E-4

Yellow Shading = Cancer risk greater than 1E-6 or non-cancer hazard index greater than 1.

TABLE RA-G-2-3
HUMAN HEALTH RISK ASSESSMENT
TIER 3 RISK AND HAZARD SUMMARY
OPERABLE UNIT 1
Matthiessen and Hegeler Zinc Company Site, OU1 - LaSalle, Illinois

Exposure Area	Receptor	Exposure Media	Tier 3 RME Exposure Media Risk Estimates ⁽¹⁾		Tier 3 CTE Exposure Media Risk Estimates ⁽¹⁾	
			Cancer Risk	Non-Cancer HI	Cancer Risk	Non-Cancer HI
Slag Pile	Future Commercial/Industrial Worker	Surface Soil (0 to 2 ft bgs)	2.9E-05	3.3E+00	2.7E-06	1.9E+00
		Subsurface Soil (0 to 10 ft bgs)	3.1E-05	3.2E+00	2.9E-06	1.8E+00
		Groundwater (Potable Use)	3.1E-04	8.6E+01	9.7E-05	7.6E+01
		Groundwater Vapors (Outdoor Air)	--	1.5E-08	--	1.4E-08
		Groundwater Vapors (Indoor Air)	--	7.3E-03	--	6.4E-03
		Total:	3.4E-04	9.0E+01	1.0E-04	7.7E+01
	Current and Future Site-Specific Worker	Surface Soil (0 to 2 ft bgs)	7.0E-06	8.0E-01	4.5E-07	2.8E-01
		Subsurface Soil (0 to 10 ft bgs)	7.5E-06	7.7E-01	4.8E-07	2.6E-01
		Groundwater Vapors (Outdoor Air)	--	3.7E-09	--	1.2E-09
		Total:	7.5E-06	8.0E-01	4.8E-07	2.8E-01
	Current and Future Utility Worker	Subsurface Soil (0 to 10 ft bgs)	1.0E-05	2.0E+00	5.8E-07	3.3E-01
		Shallow Groundwater (<10 ft bgs)	9.0E-07	1.6E-01	1.4E-07	7.7E-02
		Groundwater Vapors (Trench Air)	--	8.0E-02	--	4.0E-02
		Total:	1.1E-05	2.2E+00	7.2E-07	4.4E-01
	Future Construction Worker	Subsurface Soil (0 to 10 ft bgs)	1.3E-06	2.9E+01	2.0E-07	1.2E+01
		Shallow Groundwater (<10 ft bgs)	1.2E-07	2.1E+00	4.6E-08	2.0E+00
		Groundwater Vapors (Trench Air)	--	1.0E+00	--	1.0E+00
		Total:	1.5E-06	3.2E+01	2.4E-07	1.5E+01
	Current Adolescent Trespasser	Surface Soil (0 to 2 ft bgs)	8.0E-07	1.0E-01	8.2E-08	3.1E-02
		Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10
	Total:	8.0E-07	1.0E-01	8.2E-08	3.1E-02	
Current Adult Trespasser	Surface Soil (0 to 2 ft bgs)	2.3E-06	9.2E-02	6.7E-08	3.1E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	2.3E-06	9.2E-02	6.7E-08	3.1E-02	
Future Child Recreationalist	Subsurface Soil (0 to 10 ft bgs)	4.7E-06	6.1E-01	6.3E-07	1.5E-01	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	4.7E-06	6.1E-01	6.3E-07	1.5E-01	
Future Adolescent Recreationalist	Subsurface Soil (0 to 10 ft bgs)	9.4E-07	9.6E-02	9.7E-08	2.9E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	9.4E-07	9.6E-02	9.7E-08	2.9E-02	
Future Adult Recreationalist	Subsurface Soil (0 to 10 ft bgs)	2.4E-06	8.8E-02	7.2E-08	3.0E-02	
	Groundwater Vapors (Outdoor Air)	--	6.7E-10	--	3.3E-10	
	Total:	2.4E-06	8.8E-02	7.2E-08	3.0E-02	

Notes:

(1) Risk and hazard estimates were calculated based on 3 tiers, which varied based on the assumed relative bioavailability (RBA) of arsenic. The following RBAs were used for arsenic:

- Tier 1 - 100%
- Tier 2 - 80%
- Tier 3 - 14% (Slag Pile only)

(2) Tier 3 risk calculation supporting tables are provided in Appendix RA-G7.

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HI = Hazard Index

ft bgs = feet below ground surface

-- = not applicable

Orange Shading = Cancer risk greater than 1E-4

Yellow Shading = Cancer risk greater than 1E-6 or non-cancer hazard index greater than 1.

TABLE RA-S2-7.RME

RISK AND HAZARD SUMMARY
 COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 1
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, IL

RAGS D Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.1.1.RME	Future	On-Site CI Worker	1	Surface Soil	Ingestion	5.60E-05	Arsenic Benzo(a)pyrene Aroclor 1248	4.3E-05 7.0E-06 1.4E-06	1.30E+00	NA	NA			
					Dermal	1.90E-05	Arsenic Benzo(a)pyrene Aroclor 1248	8.4E-06 6.0E-06 1.3E-06	2.70E-01	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.40E-07	NA	NA	5.40E-01	NA	NA			
				Surface Soil Total					7.50E-05			2.10E+00		
				Subsurface Soil	Ingestion	4.30E-05	Arsenic Benzo(a)pyrene Aroclor 1248	3.3E-05 4.7E-06 1.4E-06	1.00E+00	NA	NA			
					Dermal	1.50E-05	Arsenic Benzo(a)pyrene Aroclor 1248	6.5E-06 4.1E-06 1.3E-06	2.40E-01	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-07	NA	NA	4.00E-01	NA	NA			
				Subsurface Soil Total					5.80E-05			1.70E+00		
				GW - MW4	Ingestion	4.90E-05	Vinyl Chloride Trichloroethene	4.5E-05 3.3E-06	2.40E+02	Cobalt Manganese	230 6.2			
				Outdoor Air Vapors -- MW4	Inhalation	3.20E-09	NA	NA	5.40E-04	NA	NA			
				Indoor Air Vapors -- MW4	Inhalation	2.20E-06	Vinyl Chloride Trichloroethene	1.1E-06 1.1E-06	1.30E-02	NA	NA			
				GW - MW4 Total					5.20E-05			2.40E+02		
				GW - MW31	Ingestion	2.70E-07	NA	NA	1.50E+01	Cadmium Zinc	8.6 4.3			
				Outdoor Air Vapors -- MW31	Inhalation	1.80E-11	NA	NA	8.00E-09	NA	NA			
				Indoor Air Vapors -- MW31	Inhalation	1.10E-08	NA	NA	6.00E-06	NA	NA			
				GW - MW31 Total					2.80E-07			1.50E+01		
				SS + GW (MW4)					1.30E-04			2.40E+02		
				SS + GW (MW31)					7.60E-05			1.70E+01		
				SB + GW (MW4)					1.10E-04			2.40E+02		
				SB + GW (MW31)					5.80E-05			1.70E+01		

TABLE RA-S2-8.RME

RISK AND HAZARD SUMMARY
 COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.1.2.RME	Future	On-Site CI Worker	2	Surface Soil	Ingestion	8.20E-06	Arsenic	7.50E-06	4.10E-01	NA	NA
					Dermal	1.70E-06	Arsenic	1.50E-06	4.40E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.70E-08	NA	NA	5.10E-03	NA	NA
						Surface Soil Total	1.00E-05			4.70E-01	
				Subsurface Soil	Ingestion	7.80E-06	Arsenic	7.00E-06	3.80E-01	NA	NA
					Dermal	1.70E-06	Arsenic	1.40E-06	3.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.20E-08	NA	NA	9.70E-03	NA	NA
						Subsurface Soil Total	9.50E-06			4.20E-01	
				GW - MW15	Ingestion	1.10E-04	Arsenic Chromium, hexavalent	1.10E-04 1.50E-06	1.20E+00	NA	NA
				Outdoor Air Vapors -- MW15	Inhalation	1.30E-12	NA	NA	--	NA	NA
				Indoor Air Vapors -- MW15	Inhalation	3.40E-11	NA	NA	--	NA	NA
					GW - MW15 Total	1.10E-04			1.20E+00		
				GW - MW22	Ingestion	3.50E-05	Arsenic Chromium, hexavalent	2.10E-05 1.30E-05	1.10E+00	NA	NA
				Outdoor Air Vapors -- MW22	Inhalation	4.20E-11	NA	NA	2.30E-06	NA	NA
				Indoor Air Vapors -- MW22	Inhalation	2.10E-09	NA	NA	6.90E-05	NA	NA
					GW - MW22 Total	3.50E-05			1.10E+00		
					SS + GW (MW15)	1.20E-04			1.70E+00		
					SS + GW (MW22)	4.50E-05			1.50E+00		
					SB + GW (MW15)	1.20E-04			1.60E+00		
					SB + GW (MW22)	4.40E-05			1.50E+00		

TABLE RA-S2-9.RME

**RISK AND HAZARD SUMMARY
 COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.1.4.RME	Future	On-Site CI Worker	4	Surface Soil	Ingestion	2.00E-04	Aroclor 1260 Arsenic Benzo(a)pyrene	1.5E-04 4.8E-05 1.4E-06	1.20E+01	Aroclor 1260 Manganese	10 1.4			
					Dermal	1.50E-04	Aroclor 1260 Arsenic Benzo(a)pyrene	1.4E-04 9.5E-06 1.2E-06	9.60E+00	Aroclor 1260	9.50E+00			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	7.70E-08	NA	NA	1.20E-01	NA	NA			
				Surface Soil Total					3.50E-04			2.20E+01		
				Subsurface Soil	Ingestion	1.10E-04	Aroclor 1260 Arsenic	6.7E-05 3.9E-05	6.20E+00	Aroclor 1260	4.70E+00			
					Dermal	7.20E-05	Aroclor 1260 Arsenic	6.2E-05 7.8E-06	4.50E+00	Aroclor 1260	4.40E+00			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.50E-08	NA	NA	7.30E-02	NA	NA			
				Subsurface Soil Total					1.80E-04			1.10E+01		
				Groundwater	Ingestion	3.80E-07	NA	NA	2.70E+00	Cadmium	2.10E+00			
				Outdoor Air Vapors -- Groundwater	Inhalation	--	NA	NA	--	NA	NA			
				Indoor Air Vapors -- Groundwater	Inhalation	--	NA	NA	--	NA	NA			
				GW Total					3.80E-07			2.70E+00		
				SS + GW					3.50E-04			2.50E+01		
				SB + GW					1.80E-04			1.30E+01		

TABLE RA-S2-10.RME

RISK AND HAZARD SUMMARY
 COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.1.5.RME	Future	On-Site CI Worker	5	Surface Soil	Ingestion	5.80E-05	Benzo(a)pyrene Arsenic Aroclor 1248 Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	2.4E-05 1.1E-05 1.0E-05 3.7E-06 3.5E-06 3.4E-06 1.3E-06	1.20E+00	NA	NA
					Dermal	4.30E-05	Benzo(a)pyrene Arsenic Aroclor 1248 Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	2.1E-05 2.2E-06 9.4E-06 3.2E-06 3.0E-06 2.9E-06 1.1E-06	7.00E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.70E-07	NA	NA	7.10E+00	Cyanide	7.10E+00
					Surface Soil Total	1.00E-04			8.90E+00		
				Subsurface Soil	Ingestion	3.20E-05	Benzo(a)pyrene Arsenic Aroclor 1248 Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene	1.3E-05 9.8E-06 1.0E-06 2.1E-06 1.9E-06 1.8E-06	4.80E-01	NA	NA
					Dermal	2.00E-05	Benzo(a)pyrene Arsenic Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene	1.1E-05 1.9E-06 1.8E-06 1.6E-06 1.6E-06	1.10E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.20E-06	NA	NA	4.20E+00	Cyanide	4.20E+00
					Subsurface Soil Total	5.30E-05			4.80E+00		

TABLE RA-S2-10.RME

RISK AND HAZARD SUMMARY
 COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
				Groundwater	Ingestion	1.10E-05	Vinyl Chloride Aroclor 1254 Trichloroethene	5.8E-06 2.0E-06 1.9E-06	4.40E-01	NA	NA
				Outdoor Air Vapors – Groundwater	Inhalation	1.20E-09	NA	NA	1.30E-06	NA	NA
				Indoor Air Vapors – Default Future Industrial	Inhalation	1.10E-06	NA	NA	2.10E-03	NA	NA
					GW - Future Ind Total	1.20E-05			4.40E-01		
				Indoor Air Vapors – Office SW	Inhalation	1.20E-06	NA	NA	2.30E-03	NA	NA
					GW - Office SW Total	1.20E-05			4.40E-01		
				Indoor Air Vapors – East Warehouse	Inhalation	2.80E-08	NA	NA	6.80E-05	NA	NA
					GW - EWH	1.10E-05			4.40E-01		
				Indoor Air Vapors – West Warehouse	Inhalation	3.80E-08	NA	NA	8.70E-05	NA	NA
					GW - WWW Total	1.10E-05			4.40E-01		
					SS + GW (Def Ind)	1.10E-04			9.40E+00		
					SB + GW (Def Ind)	6.50E-05			5.20E+00		
					SS + GW (Office SW)	1.10E-04			9.40E+00		
					SB + GW (Office SW)	6.50E-05			5.20E+00		
					SS + GW (EWH)	1.10E-04			9.40E+00		
					SB + GW (EWH)	6.40E-05			5.20E+00		
					SS + GW (WWW)	1.10E-04			9.40E+00		
					SB + GW (WWW)	6.40E-05			5.20E+00		

TABLE RA-S2-11.RME

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.1.RME	Future	On-Site Utility Worker	1	Subsurface Soil	Ingestion	1.10E-05	Arsenic	8.7E-06	2.80E-01	NA	NA
					Dermal	1.80E-06	Benzo(a)pyrene	1.2E-06	2.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.60E-09	NA	NA	1.60E-02	NA	NA
					Subsurface Soil Total	1.30E-05			3.20E-01		
				GW, Trench (MW04)	Inhalation	4.30E-07	NA	NA	3.20E-03	NA	NA
					GW - MW4 Total	4.30E-07			3.20E-03		
				GW, Trench (MW31)	Inhalation	2.50E-09	NA	NA	1.40E-06	NA	NA
					GW - MW31 Total	2.50E-09			1.40E-06		
						SB + GW (MW04)	1.40E-05		3.30E-01		
						SB + GW (MW31)	1.30E-05		3.20E-01		

TABLE RA-S2-11B.RME

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.1B.RME	Future	On-Site Utility Worker	1	Subsurface Soil	Ingestion	1.70E-04	Aroclor-1260 Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Chromium, hexavalent Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene	7.20E-06 1.10E-04 4.80E-06 3.10E-05 5.40E-06 1.00E-06 5.20E-06 1.80E-06	5.20E+00	Cadmium	1.90E+00
					Dermal	3.20E-05	Aroclor-1260 Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenzo(a,h)anthracene	3.00E-06 1.00E-05 1.90E-06 1.20E-05 2.10E-06 2.00E-06	5.20E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.80E-07	NA	NA	2.60E-01	NA	NA
					Subsurface Soil Total	2.00E-04			6.00E+00		
				GW, Trench (MW04)	Inhalation	4.30E-07	NA	NA	3.20E-03	NA	NA
					GW - MW4 Total	4.30E-07			3.20E-03		
				GW, Trench (MW31)	Inhalation	2.50E-09	NA	NA	1.40E-06	NA	NA
					GW - MW31 Total	2.50E-09			1.40E-06		
					SB + GW (MW04)	2.00E-04			6.00E+00		
					SB + GW (MW31)	2.00E-04			6.00E+00		

TABLE RA-S2-12.RME

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGLER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.2.RME	Future	On-Site Utility Worker	2	Subsurface Soil	Ingestion	2.10E-06	Arsenic	1.90E-06	9.90E-02	NA	NA
					Dermal	2.00E-07	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.50E-09	NA	NA	3.90E-04	NA	NA
					Subsurface Soil Total	2.30E-06			1.00E-01		
				Groundwater (MW15)	Ingestion	1.10E-07	NA	NA	1.20E-03	NA	NA
				Groundwater (MW15)	Dermal	3.00E-07	NA	NA	3.40E-03	NA	NA
				GW, Trench (MW15)	Inhalation	5.70E-09	NA	NA	--	NA	NA
					GW - MW15 Total	4.20E-07			4.60E-03		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	3.60E-09	NA	NA	4.90E-04	NA	NA
					GW - MW22 Total	3.60E-09			4.90E-04		
					SB + GW (MW15)	2.70E-06			1.00E-01		
					SB + GW (MW22)	2.30E-06			1.00E-01		

TABLE RA-S2-
12B.RME

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.2B.RME	Future	On-Site Utility Worker	2	Subsurface Soil	Ingestion	1.40E-05	Arsenic	1.40E-05	3.70E-01	NA	NA
					Dermal	1.30E-06	Arsenic	1.20E-06	1.70E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.60E-09	NA	NA	1.20E-03	NA	NA
				Subsurface Soil Total		1.50E-05			3.80E-01		
				Groundwater (MW15)	Ingestion	1.10E-07	NA	NA	1.20E-03	NA	NA
				Groundwater (MW15)	Dermal	3.00E-07	NA	NA	3.40E-03	NA	NA
				GW, Trench (MW15)	Inhalation	5.70E-09	NA	NA	--	NA	NA
				GW - MW15 Total		4.20E-07			4.60E-03		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	3.60E-09	NA	NA	4.90E-04	NA	NA
				GW - MW22 Total		3.60E-09			4.90E-04		
					SB + GW (MW15)	1.60E-05			3.90E-01		
					SB + GW (MW22)	1.50E-05			3.90E-01		

TABLE RA-S2-13.RME

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.3.RME	Future	On-Site Utility Worker	3	Subsurface Soil	Ingestion	2.90E-06	Arsenic	2.70E-06	9.30E-02	NA	NA
					Dermal	2.80E-07	NA	NA	4.30E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.00E-09	NA	NA	3.80E-04	NA	NA
					Subsurface Soil Total	3.20E-06			9.70E-02		
				Groundwater	Ingestion	1.70E-09	NA	NA	1.90E-03	NA	NA
				Groundwater	Dermal	1.50E-07	NA	NA	1.50E-02	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	1.50E-07			1.60E-02		
					SB + GW	3.40E-06			1.10E-01		

TABLE RA-S2-13B.RME

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.3B.RME	Future	On-Site Utility Worker	3	Subsurface Soil	Ingestion	1.80E-05	Arsenic	1.80E-05	3.50E-01	NA	NA
					Dermal	1.60E-06	Arsenic	1.60E-06	1.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.10E-08	NA	NA	1.20E-03	NA	NA
					Subsurface Soil Total	2.00E-05			3.70E-01		
				Groundwater	Ingestion	1.70E-09	NA	NA	1.90E-03	NA	NA
				Groundwater	Dermal	1.50E-07	NA	NA	1.50E-02	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	1.50E-07			1.50E-02		
					SB + GW	2.00E-05			3.90E-01		

TABLE RA-S2-14.RME

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.4.RME	Future	On-Site Utility Worker	4	Subsurface Soil	Ingestion	2.90E-05	Aroclor 1260 Arsenic	1.8E-05 1.0E-05	1.60E+00	Aroclor 1260	1.20E+00
					Dermal	8.70E-06	Aroclor 1260	7.50E-06	5.40E-01	NA	NA
					Inhalation	2.60E-09	NA	NA	2.90E-03	NA	NA
					Subsurface Soil Total		3.80E-05		2.20E+00		
No groundwater exposures, risks, hazards											

TABLE RA-S2-14B.RME

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.4B.RME	Future	On-Site Utility Worker	4	Subsurface Soil	Ingestion	5.80E-05	Aroclor 1260 Arsenic	3.90E-05 1.80E-05	3.60E+00	Aroclor 1260	2.70E+00
					Dermal	1.80E-05	Aroclor 1260 Arsenic	1.60E-05 1.60E-06			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.50E-09	NA	NA	7.40E-03	NA	NA
				Subsurface Soil Total					7.70E-05		
No groundwater exposures, risks, hazards											

TABLE RA-S2-15.RME

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.2.5.RME	Future	On-Site Utility Worker	5	Subsurface Soil	Ingestion	8.40E-06	Benzo(a)pyrene Arsenic	3.4E-06 2.6E-06	1.30E-01	NA	NA			
					Dermal	2.40E-06	Benzo(a)pyrene	1.30E-06	1.30E-02	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.90E-08	NA	NA	1.70E-01	NA	NA			
				Subsurface Soil Total					1.10E-05			3.10E-01		
				GW, Trench (MW29)	Inhalation	--	NA	NA	3.80E-04	NA	NA			
				GW - MW29 Total					--			3.80E-04		
				GW, Trench (MW30)	Inhalation	1.60E-07	NA	NA	1.80E-04	NA	NA			
				GW - MW30 Total					1.60E-07			1.80E-04		
				SB + GW (MW29)					1.10E-05			3.10E-01		
				SB + GW (MW30)					1.10E-05			3.10E-01		

TABLE RA-S2-15B.RME

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.5B.RME	Future	On-Site Utility Worker	5	Subsurface Soil	Ingestion	6.60E-05	Aroclor-1248 Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene	2.70E-06 1.30E-05 4.80E-06 3.30E-05 4.80E-06 4.90E-06 1.7E-06	6.70E-01	NA	NA
					Dermal	2.20E-05	Aroclor-1248 Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenzo(a,h)anthracene	1.10E-06 1.20E-06 1.90E-06 1.30E-05 1.90E-06 1.90E-06	9.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.70E-07	NA	NA	1.90E+00	Cyanide	1.90E+00
					Subsurface Soil Total	8.80E-05			2.70E+00		
				GW, Trench (MW29)	Inhalation	--	NA	NA	3.80E-04	NA	NA
					GW - MW29 Total	--			3.80E-04		
				GW, Trench (MW30)	Inhalation	1.60E-07	NA	NA	1.80E-04	NA	NA
					GW - MW30 Total	1.60E-07			1.80E-04		
					SB + GW (MW29)	8.80E-05			2.70E+00		
					SB + GW (MW30)	8.80E-05			2.70E+00		

TABLE RA-S2-16.RME

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 6
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.6.RME	Current/ Future	Utility Worker	6	Surface Soil	Ingestion	2.40E-06	Arsenic	2.30E-06	6.00E-02	NA	NA
					Dermal	2.00E-07	NA	NA	2.20E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-09	NA	NA	3.40E-04	NA	NA
				Surface Soil Total		2.60E-06			6.30E-02		
No groundwater exposures, risks, hazards											

TABLE RA-S2-16B.RME

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 6
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.6B.RME	Current/ Future	Utility Worker	6	Surface Soil	Ingestion	1.10E-05	Arsenic	1.10E-05	2.10E-01	NA	NA
					Dermal	9.70E-07	NA	NA	9.80E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.40E-09	NA	NA	1.30E-03	NA	NA
				Surface Soil Total					1.20E-05		
No groundwater exposures, risks, hazards											

TABLE RA-S2-17.RME

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 1
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.1.RME	Future	On-Site Construction Worker	1	Subsurface Soil	Ingestion	1.50E-06	Arsenic	1.10E-06	3.60E+00	NA	NA
					Dermal	2.30E-07	NA	NA	3.70E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.00E-09	NA	NA	2.00E+00	Mercury	2
					Subsurface Soil Total	1.70E-06			6.00E+00		
				GW, Trench (MW04)	Inhalation	5.60E-08	NA	NA	4.20E-02	NA	NA
					GW - MW4 Total	5.60E-08			4.20E-02		
				GW, Trench (MW31)	Inhalation	3.30E-10	NA	NA	1.90E-05	NA	NA
					GW - MW31 Total	3.30E-10			1.90E-05		
						SB + GW (MW04)	1.80E-06		6.00E+00		
						SB + GW (MW31)	1.70E-06		6.00E+00		

TABLE RA-S2-17B.RME

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard																													
S7.3.1B.RME	Future	On-Site Construction Worker	1	Subsurface Soil	Ingestion	2.20E-05	Arsenic Benzo(a)pyrene	1.50E-05 4.00E-06	6.80E+01	Antimony Aroclor-1260 Arsenic Cadmium Cobalt Manganese Mercury Zinc	8.80E+00 6.60E+00 9.10E+00 2.50E+01 2.90E+00 6.10E+00 1.70E+00 4.60E+00																													
												Dermal	4.20E-06	Arsenic Benzo(a)pyrene	1.30E-06 1.60E-06	6.80E+00	Aroclor-1260 Cadmium	2.80E+00 3.00E+00																						
																			Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.20E-07	NA	NA	3.10E+01	Mercury	3.10E+01														
																											Subsurface Soil Total		2.60E-05		1.10E+02									
																											GW, Trench (MW04)	Inhalation	5.60E-08	NA	NA	4.20E-02	NA	NA						
																																			GW - MW4 Total		5.60E-08		4.20E-02	
																											GW, Trench (MW31)	Inhalation	3.30E-10	NA	NA	1.90E-05	NA	NA						
																																			GW - MW31 Total		3.30E-10		1.90E-05	
																																			SB + GW (MW04)	2.60E-05		1.10E+02		
																											SB + GW (MW31)	2.60E-05		1.10E+02										

TABLE RA-S2-18.RME

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.2.RME	Future	On-Site Construction Worker	2	Subsurface Soil	Ingestion	2.7E-07	NA	NA	1.30E+00	NA	NA
					Dermal	2.6E-08	NA	NA	6.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.40E-10	NA	NA	1.00E-02	NA	NA
					Subsurface Soil Total	2.90E-07			1.40E+00		
				Groundwater (MW15)	Ingestion	1.50E-08	NA	NA	1.60E-02	NA	NA
				Groundwater (MW15)	Dermal	3.90E-08	NA	NA	4.50E-02	NA	NA
				GW, Trench (MW15)	Inhalation	7.40E-10	NA	NA	--	NA	NA
					GW - MW4 Total	5.40E-08			6.00E-02		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	4.60E-10	NA	NA	6.40E-03	NA	NA
					GW - MW31 Total	4.60E-10			6.40E-03		
					SB + GW (MW15)	3.50E-07			1.40E+00		
					SB + GW (MW22)	2.90E-07			1.40E+00		

TABLE RA-S2-18B.RME

**RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7.3.2B.RME	Future	On-Site Construction Worker	2	Subsurface Soil	Ingestion	1.8E-06	Arsenic	1.80E-06	4.80E+00	Arsenic Zinc	1.10E+00 1.50E+00	
					Dermal	1.6E-07	NA	NA	2.20E-01	NA	NA	
					Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	3.10E-02	NA	NA
						Subsurface Soil Total	2.00E-06			5.00E+00		
				Groundwater (MW15)	Ingestion	1.50E-08	NA	NA	1.60E-02	NA	NA	
				Groundwater (MW15)	Dermal	3.90E-08	NA	NA	4.50E-02	NA	NA	
				GW, Trench (MW15)	Inhalation	7.40E-10	NA	NA	--	NA	NA	
						GW - MW4 Total	5.40E-08			6.00E-02		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA	
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA	
				GW, Trench (MW22)	Inhalation	4.60E-10	NA	NA	6.40E-03	NA	NA	
						GW - MW31 Total	4.60E-10			6.40E-03		
						SB + GW (MW15)	2.00E-06			5.10E+00		
		SB + GW (MW22)	2.00E-06			5.00E+00						

TABLE RA-S2-19.RME

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.3.RME	Future	On-Site Construction Worker	3	Subsurface Soil	Ingestion	3.80E-07	NA	NA	1.20E+00	NA	NA
					Dermal	3.60E-08	NA	NA	5.60E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	7.90E-10	NA	NA	1.00E-02	NA	NA
					Subsurface Soil Total	4.20E-07			1.30E+00		
				Groundwater	Ingestion	2.10E-10	NA	NA	2.50E-02	NA	NA
					Dermal	2.00E-08	NA	NA	1.90E-01	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	2.00E-08			2.10E-01		
					SB + GW	4.40E-07			1.50E+00		

TABLE RA-S2-19B.RME

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.3B.RME	Future	On-Site Construction Worker	3	Subsurface Soil	Ingestion	2.40E-06	Arsenic	2.30E-06	4.60E+00	Arsenic	1.40E+00
					Dermal	2.10E-07	NA	NA	2.50E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.90E-09	NA	NA	3.10E-02	NA	NA
					Subsurface Soil Total	2.60E-06			4.80E+00		
				Groundwater	Ingestion	2.10E-10	NA	NA	4.80E-02	NA	NA
					Dermal	2.00E-08	NA	NA	1.90E-01	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	2.00E-08			2.10E-01		
					SB + GW	2.60E-06			5.10E+00		

TABLE RA-S2-20.RME

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.4.RME	Future	On-Site Construction Worker	4	Subsurface Soil	Ingestion	3.80E-06	Aroclor 1260 Arsenic	2.3E-06 1.3E-06	2.10E+01	Aroclor 1260 Manganese	1.6E+01 2.9E+00
					Dermal	1.10E-06	NA	NA	7.00E+00	Aroclor 1260	6.80E+00
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.80E-10	NA	NA	7.60E-02	NA	NA
				Subsurface Soil Total	4.90E-06			2.90E+01			

No groundwater exposures, risks, hazards

TABLE RA-S2-20B.RME

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.4b.RME	Future	On-Site Construction Worker	4	Subsurface Soil	Ingestion	7.60E-06	Aroclor 1260 Arsenic	5.00E-06 2.40E-06	4.70E+01	Aroclor 1260 Arsenic Manganese	3.50E+01 1.50E+00 7.30E+00
					Dermal	2.40E-06	Aroclor 1260	2.10E-06		1.50E+01	Aroclor 1260
					Inhalation	1.20E-09	NA	NA	1.90E-01	NA	NA
					Subsurface Soil Total	1.00E-05			6.20E+01		

No groundwater exposures, risks, hazards

TABLE RA-S2-21.RME

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.5.RME	Future	On-Site Construction Worker	5	Subsurface Soil	Ingestion	1.10E-06	NA	NA	1.70E+00	NA	NA
					Dermal	3.10E-07	NA	NA	1.70E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.20E-08	NA	NA	2.20E+01	Cyanide	2.2E+01
						Subsurface Soil Total	1.50E-06			2.40E+01	
				GW, Trench (MW29)	Inhalation	--	NA	NA	5.00E-03	NA	NA
						GW - MW29 Total	--			5.00E-03	
				GW, Trench (MW30)	Inhalation	2.10E-08	NA	NA	2.30E-03	NA	NA
						GW - MW30 Total	2.10E-08			2.30E-03	
					SB + GW (MW29)	1.50E-06			2.40E+01		
						SB + GW (MW30)	1.50E-06			2.40E+01	

TABLE RA-S2-21B.RME

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.3.5B.RME	Future	On-Site Construction Worker	5	Subsurface Soil	Ingestion	8.60E-06	Arsenic	1.70E-06	8.80E+00	Aroclor-1248	2.40E+00			
					Dermal	2.80E-06	Benzo(a)pyrene	4.30E-06		Arsenic	1.10E+00			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.10E-07	NA	NA	2.50E+02	Cyanide	2.50E+02	Aroclor-1248	1.00E+00	
												Subsurface Soil Total	1.20E-05	2.60E+02
				GW, Trench (MW29)	Inhalation	--	NA	NA	5.00E-03	NA	NA	NA	NA	
														GW - MW29 Total
				GW, Trench (MW30)	Inhalation	2.10E-08	NA	NA	2.30E-03	NA	NA	NA	NA	
														GW - MW30 Total
										SB + GW (MW29)	1.20E-05	2.60E+02		
										SB + GW (MW30)	1.20E-05	2.60E+02		

TABLE RA-S2-22.RME

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 6
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.6.RME	Current/ Future	Construction Worker	6	Surface Soil	Ingestion	3.20E-07	NA	NA	7.80E-01	NA	NA
					Dermal	2.70E-08	NA	NA	2.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.90E-10	NA	NA	2.40E-02	NA	NA
				Surface Soil Total		3.40E-07			8.40E-01		
No groundwater exposures, risks, hazards											

TABLE RA-S2-22B.RME

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 6
REASONABLE MAXIMUM EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.6b.RME	Current/ Future	Construction Worker	6	Surface Soil	Ingestion	1.50E-06	Arsenic	1.40E-06	2.70E+00	NA	NA
					Dermal	1.30E-07	NA	NA	1.30E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9.00E-10	NA	NA	8.90E-02	NA	NA
					Surface Soil Total	1.60E-06			3.00E+00		
No groundwater exposures, risks, hazards											

TABLE RA-S2-23.RME

**RISK AND HAZARD SUMMARY
 ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 1
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.1.RME	Current/ Future	Trespasser Adolescent	1	Surface Soil	Ingestion	6.60E-07	NA	NA	2.80E-02	NA	NA
					Dermal	1.50E-06	NA	NA	2.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.10E-09	NA	NA	3.60E-02	NA	NA
						Surface Soil Total	2.20E-06			9.20E-02	
				Subsurface Soil	Ingestion	5.00E-07	NA	NA	2.30E-02	NA	NA
					Dermal	1.10E-06	NA	NA	2.50E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.30E-09	NA	NA	2.70E-02	NA	NA
						Subsurface Soil Total	1.60E-06			7.40E-02	
				Surface Water	Ingestion	8.20E-08	NA	NA	4.80E-02	NA	NA
						Dermal	9.60E-07	NA	NA	2.40E-01	NA
					Surface Water Total	1.00E-06			2.90E-01		
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.00E-10	NA	NA	2.30E-05	NA	NA
						GW - MW04 Total	1.00E-10			2.30E-05	
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	3.00E-13	NA	NA	3.50E-10	NA	NA
						GW - MW31 Total	3.00E-13			3.50E-10	
					SS + SW + GW (MW04)	3.20E-06			3.80E-01		
					SB + SW + GW (MW04)	2.60E-06			3.70E-01		
					SS + SW + GW (MW31)	3.20E-06			3.80E-01		
					SB + SW + GW (MW31)	2.60E-06			3.70E-01		

TABLE RA-S2-24.RME

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.2.RME	Current/ Future	Trespasser Adolescent	2	Surface Soil	Ingestion	8.30E-08	NA	NA	8.80E-03	NA	NA
					Dermal	9.40E-08	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.90E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	1.80E-07			1.40E-02		
					Subsurface Soil	Ingestion	7.90E-08	NA	NA	8.10E-03	NA
				Dermal		9.00E-08	NA	NA	6.80E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.80E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	1.70E-07			1.50E-02		
					Groundwater Outdoor Air Vapors-- MW15	Inhalation	2.20E-14	NA	NA	--	NA
				GW - MW15 Total		2.20E-14			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	7.20E-13	NA	NA	9.90E-08	NA	NA
					GW - M22 Total	7.20E-13			9.90E-08		
						SS + GW (MW15)	1.80E-07			1.40E-02	
				SB + GW (MW15)		1.70E-07			1.50E-02		
				SS + GW (MW22)		1.80E-07			1.40E-02		
				SB + GW (MW22)		1.70E-07			1.50E-02		

TABLE RA-S2-25.RME

**RISK AND HAZARD SUMMARY
 ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.3.RME	Current/ Future	Trespasser Adolescent	3	Surface Soil	Ingestion	1.20E-07	NA	NA	7.90E-03	NA	NA
					Dermal	1.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.20E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	2.60E-07			1.30E-02		
					Subsurface Soil	Ingestion	1.10E-07	NA	NA	7.50E-03	NA
				Dermal		1.20E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.30E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	2.30E-07			1.20E-02		
					Surface Water	Ingestion	5.40E-08	NA	NA	2.10E-02	NA
				Dermal		1.10E-07	NA	NA	1.10E-01	NA	NA
				Surface Water Total	1.70E-07			1.30E-01			
					SS + SW	4.30E-07			1.40E-01		
					SB + SW	4.00E-07			1.40E-01		

TABLE RA-S2-26.RME

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.4.RME	Current/ Future	Trespasser Adolescent	4	Surface Soil	Ingestion	1.80E-06	Aroclor 1260	1.30E-06	2.70E-01	NA	NA
					Dermal	6.30E-06	Aroclor 1260	5.60E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	8.10E-06			1.30E+00		
				Subsurface Soil	Ingestion	9.90E-07	NA	NA	1.30E-01	NA	NA
					Dermal	3.20E-06	Aroclor 1260	2.60E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	4.10E-06			6.00E-01		
				Surface Soil Total	8.10E-06			1.30E+00			
				Subsurface Soil Total	4.10E-06			6.00E-01			

TABLE RA-S2-27.RME

**RISK AND HAZARD SUMMARY
 ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7.4.5.RME	Current/ Future	Trespasser Adolescent	5	Surface Soil	Ingestion	1.10E-06	NA	NA	2.60E-02	NA	NA	
					Dermal	4.40E-06	Benzo(a)pyrene	2.60E-06	7.30E-02	NA	NA	
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-08	NA	NA	4.80E-01	NA	NA	
						Surface Soil Total	5.50E-06			5.80E-01		
						Subsurface Soil	Ingestion	6.20E-07	NA	NA	1.00E-02	NA
				Dermal	2.20E-06		Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA	
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-08	NA	NA	2.90E-01	NA	NA	
						Subsurface Soil Total	2.90E-06			3.10E-01		
						Surface Water	Ingestion	2.80E-08	NA	NA	4.70E-04	NA
				Dermal	1.10E-07		NA	NA	4.20E-04	NA	NA	
					Surface Water Total	1.40E-07			8.80E-04			
				Groundwater Outdoor Air Vapors-- MW30	Inhalation	2.70E-11	NA	NA	5.50E-08	NA	NA	
						GW - MW30 Total	2.70E-11			5.50E-08		
						SS + SW + GW (MW30)	5.60E-06			5.80E-01		
					SB + SW + GW (MW30)	3.00E-06			3.10E-01			

TABLE RA-S2-28.RME

**RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.1.RME_1	Current/ Future	Trespasser Adult	1	Surface Soil	Ingestion	1.40E-06	NA	NA	2.80E-02	NA	NA
					Dermal	2.40E-06	NA	NA	2.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.20E-08	NA	NA	2.10E-02	NA	NA
					Surface Soil Total	3.90E-06			7.70E-02		
					Subsurface Soil	Ingestion	1.10E-06	NA	NA	2.30E-02	NA
				Dermal		1.80E-06	NA	NA	2.50E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8.40E-09	NA	NA	1.60E-02	NA	NA
					Subsurface Soil Total	3.00E-06			6.30E-02		
					Surface Water	Ingestion	1.80E-07	NA	NA	4.80E-02	NA
				Dermal		1.10E-06	NA	NA	2.40E-01	NA	NA
					Surface Water Total	1.20E-06			2.90E-01		
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.60E-10	NA	NA	2.30E-05	NA	NA
					GW - MW04 Total	1.60E-10			2.30E-05		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	9.10E-13	NA	NA	3.50E-10	NA	NA
					GW - MW31 Total	9.10E-13			3.50E-10		
					SS + SW + GW (MW04)	5.10E-06			3.70E-01		
					SB + SW + GW (MW04)	4.20E-06			3.50E-01		
					SS + SW + GW (MW31)	5.10E-06			3.70E-01		
					SB + SW + GW (MW31)	4.20E-06			3.50E-01		

TABLE RA-S2-29.RME

**RISK AND HAZARD SUMMARY
 ADULT TRESPASSER, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.2.RME	Current/ Future	Trespasser Adult	2	Surface Soil	Ingestion	2.10E-07	NA	NA	8.80E-03	NA	NA
					Dermal	2.20E-07	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.50E-09	NA	NA	4.40E-04	NA	NA
						Surface Soil Total	4.30E-07		1.40E-02		
						Subsurface Soil	Ingestion	2.00E-07	NA	NA	8.10E-03
				Dermal	2.10E-07			NA	NA	4.00E-03	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.20E-09	NA	NA	4.20E-04	NA	NA
						Subsurface Soil Total	4.10E-07		1.20E-02		
						Groundwater Outdoor Air Vapors-- MW15	Inhalation	6.70E-14	NA	NA	--
				GW - MW15 Total	6.70E-14				--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	3.90E-13	NA	NA	9.70E-08	NA	NA
						GW - M22 Total	3.90E-13		9.70E-08		
							SS + GW (MW15)	4.30E-07		1.40E-02	
				SB + GW (MW15)	4.10E-07			1.20E-02			
				SS + GW (MW22)	4.30E-07			1.40E-02			
				SB + GW (MW22)	4.10E-07			1.20E-02			

TABLE RA-S2-30.RME

**RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.3.RME	Current/ Future	Trespasser Adult	3	Surface Soil	Ingestion	3.30E-07	NA	NA	7.90E-03	NA	NA
					Dermal	3.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.90E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	6.70E-07			1.30E-02		
				Subsurface Soil	Ingestion	2.90E-07	NA	NA	7.50E-03	NA	NA
					Dermal	2.90E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.90E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	5.80E-07			1.20E-02		
				Surface Water	Ingestion	1.50E-07	NA	NA	2.10E-02	NA	NA
					Dermal	1.50E-07	NA	NA	1.10E-01	NA	NA
					Surface Water Total	3.00E-07			1.30E-01		
					SS + SW	9.70E-07			1.40E-01		
					SB + SW	8.80E-07			1.40E-01		

TABLE RA-S2-31.RME

**RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.4.RME	Current/ Future	Trespasser Adult	4	Surface Soil	Ingestion	5.10E-06	Aroclor 1260 Arsenic	3.8E-06 1.2E-06	2.70E-01	NA	NA
					Dermal	1.80E-05	Aroclor 1260 Arsenic	1.7E-05 1.2E-06			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	2.40E-05			1.30E+00		
				Subsurface Soil	Ingestion	2.80E-06	Aroclor 1260 Arsenic	1.7E-06 1.0E-06	1.30E-01	NA	NA
					Dermal	9.00E-06	Aroclor 1260	7.80E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	1.20E-05			6.00E-01		
					Surface Soil Total	2.40E-05			1.30E+00		
				Subsurface Soil Total	1.20E-05			6.10E-01			

TABLE RA-S2-32.RME

RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.5.RME	Current/ Future	Trespasser Adult	5	Surface Soil	Ingestion	1.50E-06	NA	NA	2.60E-02	NA	NA
					Dermal	5.40E-06	Benzo(a)pyrene Aroclor 1248	2.6E-06 1.2E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.80E-08	NA	NA	2.80E-01	NA	NA
					Surface Soil Total	6.90E-06	.		3.80E-01		
				Subsurface Soil	Ingestion	8.20E-07	NA	NA	1.00E-02	NA	NA
					Dermal	2.50E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.80E-08	NA	NA	1.70E-01	NA	NA
					Subsurface Soil Total	3.40E-06			1.90E-01		
				Surface Water	Ingestion	7.80E-08	NA	NA	4.70E-04	NA	NA
					Dermal	1.60E-07	NA	NA	4.20E-04	NA	NA
					Surface Water Total	2.40E-07			8.80E-04		
				Groundwater Outdoor Air Vapors-- MW30	Inhalation	6.30E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	6.30E-11			5.50E-08		
					SS + SW + GW (MW30)	7.10E-06			3.80E-01		
					SB + SW + GW (MW30)	3.60E-06			1.90E-01		

TABLE RA-S2-33.RME

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard				
S7.6.1.RME	Future	Child Recreationalist	1	Surface Soil	Ingestion	4.90E-06	Arsenic	2.0E-06	2.60E-01	NA	NA				
					Dermal	9.30E-06	Benzo(a)pyrene	1.8E-06							
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5.00E-09	NA	NA	4.60E-02	NA	NA				
					Surface Soil Total	1.40E-05			4.90E-01						
				Subsurface Soil	Ingestion	3.60E-06	Arsenic	1.6E-06	2.10E-01	NA	NA				
					Dermal	6.60E-06	Benzo(a)pyrene	1.2E-06							
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.50E-09	NA	NA	3.40E-02	NA	NA				
					Subsurface Soil Total	1.00E-05			4.10E-01						
				Surface Water	Ingestion	1.80E-07	NA	NA	1.30E-01	NA	NA				
					Dermal	1.80E-06	NA	NA	4.30E-01	NA	NA				
				Surface Water Total	1.90E-06			5.60E-01							
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	9.70E-11	NA	NA	2.30E-05	NA	NA				
					GW - MW04 Total	9.70E-11			2.30E-05						
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	1.80E-13	NA	NA	3.50E-10	NA	NA				
					GW - MW31 Total	1.80E-13			3.50E-10						
										SS + SW + GW (MW04)	1.60E-05		1.10E+00		
										SB + SW + GW (MW04)	1.20E-05		9.70E-01		
										SS + SW + GW (MW31)	1.60E-05		1.10E+00		
										SB + SW + GW (MW31)	1.20E-05		9.70E-01		

TABLE RA-S2-34.RME

RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.2.RME	Future	Child Recreationalist	2	Surface Soil	Ingestion	5.50E-07	NA	NA	8.20E-02	NA	NA
					Dermal	4.70E-07	NA	NA	3.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.60E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	1.00E-06			1.10E-01		
				Subsurface Soil	Ingestion	5.30E-07	NA	NA	7.50E-02	NA	NA
					Dermal	4.50E-07	NA	NA	2.60E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.60E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	9.80E-07			8.00E-02		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	1.30E-14	NA	NA	--	NA	NA
					GW - MW15 Total	1.30E-14			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	4.30E-13	NA	NA	9.90E-08	NA	NA
					GW - M22 Total	4.30E-13			9.90E-08		
					SS + GW (MW15)	1.00E-06			1.10E-01		
					SB + GW (MW15)	9.80E-07			1.00E-01		
					SS + GW (MW22)	1.00E-06			1.10E-01		
					SB + GW (MW22)	9.80E-07			1.10E-01		

TABLE RA-S2-35.RME

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.3.RME	Future	Child Recreationalist	3	Surface Soil	Ingestion	7.90E-07	NA	NA	7.30E-02	NA	NA
					Dermal	6.40E-07	NA	NA	2.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-09	NA	NA	4.20E-04	NA	NA
						Surface Soil Total	1.40E-06			1.00E-01	
					Subsurface Soil	Ingestion	7.20E-07	NA	NA	7.00E-02	NA
				Dermal		5.80E-07	NA	NA	2.40E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.00E-09	NA	NA	4.10E-04	NA	NA
						Subsurface Soil Total	1.30E-06			9.50E-02	
					Surface Water	Ingestion	9.50E-08	NA	NA	9.50E-02	NA
				Dermal		2.00E-07	NA	NA	1.90E-01	NA	NA
					Surface Water Total	2.90E-07			2.50E-01		
					SS + SW	1.70E-06			3.50E-01		
					SB + SW	1.60E-06			3.40E-01		

TABLE RA-S2-36.RME

RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.4.RME	Future	Child Recreationalist	4	Surface Soil	Ingestion	1.00E-05	Aroclor 1260 Arsenic	7.1E-06 2.3E-06	2.50E+00	Aroclor 1260	2.10E+00
					Dermal	2.60E-05	Aroclor 1260 Arsenic Benzo(a)pyrene	2.2E-05 1.6E-06 1.0E-06	6.50E+00	Aroclor 1260	6.50E+00
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.60E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	3.60E-05			9.00E+00		
				Subsurface Soil	Ingestion	5.80E-06	Aroclor 1260 Arsenic	3.2E-06 1.9E-06	1.30E+00	NA	NA
					Dermal	1.30E-05	Aroclor 1260 Arsenic	1.0E-05 1.3E-06	3.00E+00	Aroclor 1260	3.00E+00
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.50E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	1.90E-05			4.30E+00		
					Surface Soil Total	3.60E-05			9.00E+00		
					Subsurface Soil Total	1.90E-05			4.30E+00		

TABLE RA-S2-36A.RME

RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGLER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.5.RME	Future	Child Recreationalist	5		Ingestion	1.10E-05	Benzo(a)pyrene	6.20E-06	2.40E-01	NA	NA
				Surface Soil	Dermal	2.90E-05	Benzo(a)pyrene Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene Aroclor 1248	1.8E-05 2.8E-06 2.6E-06 2.5E-06 1.5E-06	4.80E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	8.70E-09	NA	NA	6.20E-01	NA	NA
					Surface Soil Total	3.90E-05			1.30E+00		
					Ingestion	5.70E-06	Benzo(a)pyrene	3.30E-06	8.60E-02	NA	NA
				Subsurface Soil	Dermal	1.50E-05	Benzo(a)pyrene Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene	9.7E-06 1.6E-06 1.4E-06 1.4E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.60E-08	NA	NA	3.70E-01	NA	NA
					Subsurface Soil Total	2.10E-05			5.40E-01		
				Surface Water	Ingestion	5.10E-08	NA	NA	1.30E-03	NA	NA
					Dermal	1.80E-07	NA	NA	7.40E-04	NA	NA
					Surface Water Total	2.30E-07			2.10E-03		
				Groundwater Outdoor Air Vapors – MW30	Inhalation	2.10E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	2.10E-11			5.50E-08		
					Surface Soil Total	4.00E-05			1.30E+00		
					Subsurface Soil Total	2.10E-05			5.40E-01		

TABLE RA-S2-37.RME

RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 7
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.7.RME	Current/ Future	Child Recreationalist	7	Surface Soil	Ingestion	9.70E-07	NA	NA	1.00E-01	NA	NA
					Dermal	5.60E-07	NA	NA	4.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.20E-09	NA	NA	7.50E-04	NA	NA
					Surface Soil Total	1.50E-06			1.50E-01		
					Surface Soil Total	1.50E-06			1.50E-01		

TABLE RA-S2-38.RME

**RISK AND HAZARD SUMMARY
 ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 1
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.1.RME	Future	Adolescent Recreationalist	1	Surface Soil	Ingestion	6.60E-07	NA	NA	2.80E-02	NA	NA
					Dermal	1.50E-06	NA	NA	2.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.10E-09	NA	NA	3.60E-02	NA	NA
					Surface Soil Total	2.20E-06			9.20E-02		
				Subsurface Soil	Ingestion	5.00E-07	NA	NA	2.30E-02	NA	NA
					Dermal	1.40E-06	NA	NA	3.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.30E-09	NA	NA	2.70E-02	NA	NA
					Subsurface Soil Total	1.90E-06			8.00E-02		
				Surface Water	Ingestion	8.20E-08	NA	NA	4.80E-02	NA	NA
					Dermal	9.50E-07	NA	NA	2.40E-01	NA	NA
					Surface Water Total	1.00E-06			2.90E-01		
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.00E-10	NA	NA	7.70E-06	NA	NA
					GW - MW04 Total	1.00E-10			7.70E-06		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	3.00E-13	NA	NA	1.20E-10		
					GW - MW31 Total	3.00E-13			1.20E-10		
					SS + SW + GW (MW04)	3.20E-06			3.80E-01		
					SB + SW + GW (MW04)	2.90E-06			3.70E-01		
					SS + SW + GW (MW31)	3.20E-06			3.80E-01		
					SB + SW + GW (MW31)	2.90E-06			3.70E-01		

TABLE RA-S2-39.RME

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.7.2.RME	Future	Adolescent Recreationalist	2	Surface Soil	Ingestion	8.30E-08	NA	NA	8.80E-03	NA	NA			
					Dermal	9.40E-08	NA	NA	4.60E-03	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.90E-09	NA	NA	4.40E-04	NA	NA			
					Surface Soil Total	1.80E-07			1.40E-02					
				Subsurface Soil	Ingestion	7.90E-08	NA	NA	8.10E-03	NA	NA			
					Dermal	9.00E-08	NA	NA	4.00E-03	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.80E-09	NA	NA	4.20E-04	NA	NA			
					Subsurface Soil Total	1.70E-07			1.20E-02					
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	2.20E-14	NA	NA	--	NA	NA			
					GW - MW15 Total	2.20E-14			--					
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	1.30E-13	NA	NA	9.70E-08	NA	NA			
					GW - M22 Total	1.30E-13			9.70E-08					
								SS + GW (MW15)	1.80E-07			1.40E-02		
								SB + GW (MW15)	1.70E-07			1.20E-02		
								SS + GW (MW22)	1.80E-07			1.40E-02		
								SB + GW (MW22)	1.70E-07			1.20E-02		

TABLE RA-S2-40.RME

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.3.RME	Future	Adolescent Recreationalist	3	Surface Soil	Ingestion	1.20E-07	NA	NA	7.90E-03	NA	NA
					Dermal	1.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.20E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	2.60E-07			1.30E-02		
				Subsurface Soil	Ingestion	1.10E-07	NA	NA	7.50E-03	NA	NA
					Dermal	1.20E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.30E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	2.30E-07			1.20E-02		
				Surface Water	Ingestion	5.40E-08	NA	NA	2.10E-02	NA	NA
					Dermal	1.10E-07	NA	NA	1.10E-01	NA	NA
					Surface Water Total	1.70E-07			1.30E-01		
					SS + SW	4.30E-07			1.40E-01		
					SB + SW	4.00E-07			1.40E-01		

TABLE RA-S2-41.RME

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.4.RME	Future	Adolescent Recreationalist	4	Surface Soil	Ingestion	1.80E-06	Aroclor 1260	1.30E-06	2.70E-01	NA	NA
					Dermal	6.30E-06	Aroclor 1260	5.60E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	8.10E-06			1.30E+00		
				Subsurface Soil	Ingestion	9.90E-07	NA	NA	1.30E-01	NA	NA
					Dermal	3.20E-06	Aroclor 1260	2.60E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	4.10E-06			6.00E-01		
						Surface Soil Total	8.10E-06		1.30E+00		
						Subsurface Soil Total	4.10E-06		6.00E-01		

TABLE RA-S2-41A.RME

RISK AND HAZARD SUMMARY
 ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.5.RME	Future	Adolescent Recreationalist	5	Surface Soil	Ingestion	1.10E-06	NA	NA	2.60E-02	NA	NA
					Dermal	4.40E-06	Benzo(a)pyrene	2.60E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-08	NA	NA	4.80E-01	NA	NA
					Surface Soil Total	5.50E-06			5.80E-01		
				Subsurface Soil	Ingestion	6.20E-07	NA	NA	1.00E-02	NA	NA
					Dermal	2.20E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-08	NA	NA	2.90E-01	NA	NA
					Subsurface Soil Total	2.90E-06			3.10E-01		
				Surface Water	Ingestion	2.80E-08	NA	NA	4.70E-04	NA	NA
					Dermal	1.10E-07	NA	NA	4.20E-04	NA	NA
					Surface Water Total	1.30E-07			8.80E-04		
				Groundwater Outdoor Air Vapors -- MW30	Inhalation	2.70E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	2.70E-11			5.50E-08		
				SS + SW + GW (MW30)	5.60E-06			5.80E-01			
				SB + SW + GW (MW30)	3.00E-06			3.10E-01			

TABLE RA-S2-42.RME

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 7
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.7.RME	Current/ Future	Adolescent Recreationalist	7	Surface Soil	Ingestion	1.60E-07	NA	NA	1.10E-02	NA	NA
					Dermal	1.40E-07	NA	NA	6.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.50E-09	NA	NA	7.50E-04	NA	NA
					Surface Soil Total	3.10E-07			1.80E-02		
					Surface Soil Total	3.10E-07			1.80E-02		

TABLE RA-S2-43.RME

**RISK AND HAZARD SUMMARY
ADULT RECREATIONALIST, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGLER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.8.1.RME	Future	Adult Recreationalist	1	Surface Soil	Ingestion	1.40E-06	Arsenic	1.10E-06	2.80E-02	NA	NA			
					Dermal	2.40E-06	Arsenic	1.10E-06	2.80E-02	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.20E-08	NA	NA	2.10E-02	NA	NA			
					Surface Soil Total	3.90E-06			7.70E-02					
				Subsurface Soil	Ingestion	1.10E-06	NA	NA	2.30E-02	NA	NA			
					Dermal	1.80E-06	NA	NA	2.50E-02	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8.40E-09	NA	NA	1.60E-02	NA	NA			
					Subsurface Soil Total	3.00E-06			6.30E-02					
				Surface Water	Ingestion	1.80E-07	NA	NA	4.80E-02	NA	NA			
					Dermal	1.10E-06	NA	NA	2.40E-01	NA	NA			
				Surface Water Total	1.20E-06			2.90E-01						
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.60E-10	NA	NA	2.30E-05	NA	NA			
					GW - MW04 Total	1.60E-10			2.30E-05					
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	9.10E-13	NA	NA	3.50E-10	NA	NA			
					GW - MW31 Total	9.10E-13			3.50E-10					
										SS + SW + GW (MW04)		3.70E-01		
										SB + SW + GW (MW04)		3.50E-01		
										SS + SW + GW (MW31)		3.70E-01		
										SB + SW + GW (MW31)		3.50E-01		

TABLE RA-S2-44.RME

RISK AND HAZARD SUMMARY
ADULT RECREATIONALIST, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.2.RME	Future	Adult Recreationalist	2	Surface Soil	Ingestion	2.10E-07	NA	NA	8.80E-03	NA	NA
					Dermal	2.20E-07	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.50E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	4.30E-07			1.40E-02		
				Subsurface Soil	Ingestion	2.00E-07	NA	NA	8.10E-03	NA	NA
					Dermal	2.10E-07	NA	NA	4.00E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.20E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	4.10E-07			1.20E-02		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	3.30E-11	NA	NA	--	NA	NA
					GW - MW15 Total	3.30E-11			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	2.40E-12	NA	NA	9.70E-08	NA	NA
					GW - M22 Total	2.40E-12			9.70E-08		
					SS + GW (MW15)	4.30E-07			1.40E-02		
					SB + GW (MW15)	4.10E-07			1.20E-02		
					SS + GW (MW22)	4.30E-07			1.40E-02		
					SB + GW (MW22)	4.10E-07			1.20E-02		

TABLE RA-S2-45.RME

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.3.RME	Future	Adult Recreationalist	3	Surface Soil	Ingestion	3.30E-07	NA	NA	7.90E-03	NA	NA
					Dermal	3.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.90E-09	NA	NA	4.20E-04	NA	NA
						Surface Soil Total	6.70E-07			1.30E-02	
					Subsurface Soil	Ingestion	2.90E-07	NA	NA	7.50E-03	NA
				Dermal		2.90E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.90E-09	NA	NA	4.10E-04	NA	NA
						Subsurface Soil Total	5.80E-07			1.20E-02	
					Surface Water	Ingestion	1.50E-07	NA	NA	2.10E-02	NA
				Dermal		1.50E-07	NA	NA	1.10E-01	NA	NA
					Surface Water Total	3.00E-07			1.30E-01		
					SS + SW	9.70E-07			1.40E-01		
					SB + SW	8.80E-07			1.40E-01		

TABLE RA-S2-46.RME

RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.4.RME	Future	Adult Recreationalist	4	Surface Soil	Ingestion	5.10E-06	Aroclor 1260 Arsenic	3.8E-06 1.2E-06	2.70E-01	NA	NA
					Dermal	1.80E-05	Aroclor 1260 Arsenic	1.7E-05 1.2E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	2.40E-05			1.30E+00		
				Subsurface Soil	Ingestion	2.80E-06	Aroclor 1260 Arsenic	1.7E-06 1.0E-06	1.30E-01	NA	NA
					Dermal	9.00E-06	Aroclor 1260	7.80E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	1.20E-05			6.00E-01		
						Surface Soil Total	2.40E-05		1.30E+00		
						Subsurface Soil Total	1.20E-05		6.00E-01		

TABLE RA-S2-46A.RME

**RISK AND HAZARD SUMMARY
ADULT RECREATIONALIST, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.5.RME	Future	Adult Recreationalist	5		Ingestion	1.50E-06	NA	NA	2.60E-02	NA	NA
				Surface Soil	Dermal	5.40E-06	Benzo(a)pyrene Aroclor 1248	2.6E-06 1.2E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.80E-08	NA	NA	2.80E-01	NA	NA
					Surface Soil Total	6.90E-06			3.80E-01		
				Subsurface Soil	Ingestion	8.20E-07	NA	NA	1.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Dermal	2.50E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
					Inhalation	5.80E-08	NA	NA	1.70E-01	NA	NA
					Subsurface Soil Total	3.40E-06			1.90E-01		
				Surface Water	Ingestion	7.80E-08	NA	NA	4.70E-04	NA	NA
					Dermal	1.60E-07	NA	NA	4.20E-04	NA	NA
					Surface Water Total	2.40E-07			8.80E-04		
				Groundwater Outdoor Air Vapors -- MW30	Inhalation	6.30E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	6.30E-11			5.50E-08		
					Surface Soil Total	7.10E-06			3.80E-01		
					Subsurface Soil Total	3.60E-06			1.90E-01		

TABLE RA-S2-47.RME

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 7
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.7.RME	Current/ Future	Adult Recreationalist	7	Surface Soil	Ingestion	4.60E-07	NA	NA	1.10E-02	NA	NA
					Dermal	4.30E-07	NA	NA	6.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.60E-09	NA	NA	7.50E-04	NA	NA
					Surface Soil Total	8.90E-07			1.80E-02		
					Surface Soil Total	8.90E-07			1.80E-02		

TABLE RA-S2-48.RME

RISK AND HAZARD SUMMARY
 RESIDENTIAL EXPOSURE, OU2 EXPOSURE AREA 6
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.9.6.186.RME	Current/ Future	Resident	6	Surface Soil	Ingestion	5.00E-05	Arsenic Chromium, Hex	3.9E-05 1.1E-05	3.00E+00	NA	NA			
					Dermal	3.70E-06	Arsenic	3.70E-06	1.00E-01	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.70E-07	NA	NA	2.00E-02	NA	NA			
				Homegrown Produce from Surface Soil	Ingestion	1.00E-04	Arsenic Chromium, Hex	9.0E-05 1.4E-05	1.50E+01	Cadmium Zinc Manganese	8.6 3.4 1.4			
				Surface Soil Total					1.60E-04			1.90E+01		
				Surface Soil Total					1.60E-04			1.90E+01		

TABLE RA-S2-49.RME

RISK AND HAZARD SUMMARY
 RESIDENTIAL EXPOSURE, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.9.2.RME	Future	Resident	2	Surface Soil	Ingestion	4.80E-05	Arsenic Hexavalent Chromium Benzo(a)pyrene	3.4E-05 8.3E-06 3.9E-06	5.40E+00	Cadmium	1.7
					Dermal	5.40E-06	Arsenic Benzo(a)pyrene	3.2E-06 1.5E-06			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.00E-07	NA	NA	2.40E-02	NA	NA
				Homegrown Produce from Surface Soil	Ingestion	1.40E-04	Arsenic Hexavalent Chromium Benzo(a)anthracene Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	7.8E-05 1.0E-05 4.6E-06 2.7E-05 1.9E-05 1.0E-06	7.60E+01	Cadmium Zinc Copper Antimony	39 28 4.1 3.0
					Surface Soil Total	1.90E-04		8.10E+01			
				Subsurface Soil	Ingestion	4.60E-05	Arsenic Hexavalent Chromium Benzo(a)pyrene	3.2E-05 8.3E-06 3.9E-06	4.90E+00	Cadmium	1.5
					Dermal	5.20E-06	Arsenic Benzo(a)pyrene	3.0E-06 1.5E-06			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.90E-07	NA	NA	2.30E-02	NA	NA
				Homegrown Produce from Subsurface Soil	Ingestion	1.30E-04	Arsenic Hexavalent Chromium Benzo(a)anthracene Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	7.3E-05 1.0E-05 4.6E-06 2.7E-05 1.9E-05 1.0E-06	6.40E+01	Cadmium Zinc Copper Antimony	33 24 3.0 3.0
					Subsurface Soil Total	1.80E-04		7.00E+01			
				GW - MW15	Ingestion	4.90E-04	Arsenic Hexavalent Chromium	4.7E-04 2.0E-05	7.80E+00	Arsenic Cobalt	4.5 1.2
						Dermal	2.40E-05	Arsenic Hexavalent Chromium Pentachlorophenol			
					Inhalation	6.60E-12	NA	NA	2.20E-01	NA	NA
					Inhalation	4.10E-08	NA	NA	—	NA	NA
				Indoor Air (Vapor Intrusion) from MW15	Inhalation	1.70E-09	NA	NA	—	NA	NA
				GW - MW15 Total		5.10E-04			8.00E+00		
				GW - MW22	Ingestion	2.60E-04	Arsenic delta-BHC Hexavalent Chromium Indeno(1,2,3-cd)pyrene	9.1E-05 1.4E-06 1.7E-04 7.6E-06	6.90E+00	Iron Aluminum	2.2 2.1
					Dermal	9.30E-05	delta-BHC Hexavalent Chromium Heptachlor epoxide	1.1E-06 8.2E-05 1.0E-06			
				Inhalation	2.10E-10	NA	NA	3.00E-01	9.60E-06	NA	NA
				Indoor Air (Household Use) from MW22	Inhalation	2.90E-06	NA	NA	6.20E-03	NA	NA
				Indoor Air (Vapor Intrusion) from MW22	Inhalation	1.10E-07	NA	NA	1.20E-03	NA	NA
				GW - MW22 Total		3.60E-04			7.30E+00		
				SS + GW (MW15)		7.10E-04			8.90E+01		
				SB + GW (MW15)		7.00E-04			7.80E+01		
				SS + GW (MW22)		5.50E-04			8.90E+01		
				SB + GW (MW22)		5.50E-04			7.70E+01		

TABLE RA-S2-7.RME_0.8

RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, IL

RAGS D Table No.	Timeframe	Exposure Area		Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
		Receptor	Area								
S7.1.1.RME_0.8	Future	On-Site CI Worker	1	Surface Soil	Ingestion	4.70E-05	Arsenic Benzo(a)pyrene Aroclor 1248	3.4E-05 7.0E-06 1.4E-06	1.20E+00	NA	NA
					Dermal	1.90E-05	Arsenic Benzo(a)pyrene Aroclor 1248	8.4E-06 6.0E-06 1.3E-06	2.70E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.40E-07	NA	NA	5.40E-01	NA	NA
					Surface Soil Total	6.70E-05			2.10E+00		
				Subsurface Soil	Ingestion	3.60E-05	Arsenic Benzo(a)pyrene Aroclor 1248	2.6E-05 4.7E-06 1.4E-06	1.00E+00	NA	NA
					Dermal	1.50E-05	Arsenic Benzo(a)pyrene Aroclor 1248	6.5E-06 4.1E-06 1.3E-06	2.40E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-07	NA	NA	4.00E-01	NA	NA
					Subsurface Soil Total	5.10E-05			1.70E+00		
				GW - MW4	Ingestion	4.90E-05	Vinyl Chloride Trichloroethene	4.5E-05 3.3E-06	2.40E+02	Cobalt Manganese	230 6.2
				Outdoor Air Vapors - MW4	Inhalation	3.20E-09	NA	NA	5.40E-04	NA	NA
				Indoor Air Vapors - MW4	Inhalation	2.20E-06	Vinyl Chloride Trichloroethene	1.1E-06 1.1E-06	1.30E-02	NA	NA
					GW - MW4 Total	5.20E-05			2.40E+02		
				GW - MW31	Ingestion	2.70E-07	NA	NA	1.50E+01	Cadmium Zinc	8.6 4.3
				Outdoor Air Vapors - MW31	Inhalation	1.80E-11	NA	NA	8.00E-09	NA	NA
				Indoor Air Vapors - MW31	Inhalation	1.10E-08	NA	NA	6.00E-06	NA	NA
					GW - MW31 Total	2.80E-07			1.50E+01		
					SS + GW (MW4)	1.20E-04			2.40E+02		
					SS + GW (MW31)	6.70E-05			1.70E+01		
					SB + GW (MW4)	1.00E-04			2.40E+02		
					SB + GW (MW31)	5.20E-05			1.70E+01		

TABLE RA-S2-8.RME_0.8

RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.1.2.RME_0.8	Future	On-Site CI Worker	2	Surface Soil	Ingestion	6.70E-06	Arsenic	6.00E-06	4.00E-01	NA	NA
					Dermal	1.70E-06	Arsenic	1.50E-06	4.40E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.70E-08	NA	NA	1.00E-02	NA	NA
					Surface Soil Total	8.50E-06			4.60E-01		
				Subsurface Soil	Ingestion	6.40E-06	Arsenic	5.60E-06	3.70E-01	NA	NA
					Dermal	1.70E-06	Arsenic	1.40E-06	3.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.20E-08	NA	NA	9.70E-03	NA	NA
					Subsurface Soil Total	8.10E-06			4.20E-01		
				GW - MW15	Ingestion	1.10E-04	Arsenic Chromium, hexavalent	1.0E-04 1.5E-06	1.20E+00	NA	NA
				Outdoor Air Vapors -- MW15	Inhalation	1.30E-12	NA	NA	--	NA	NA
				Indoor Air Vapors -- MW15	Inhalation	3.40E-11	NA	NA	--	NA	NA
					GW - MW15 Total	1.10E-04			1.20E+00		
				GW - MW22	Ingestion	3.50E-05	Arsenic Chromium, hexavalent	2.1E05 1.3E05	1.10E+00	NA	NA
				Outdoor Air Vapors -- MW22	Inhalation	4.20E-11	NA	NA	2.30E-06	NA	NA
				Indoor Air Vapors -- MW22	Inhalation	2.10E-09	NA	NA	6.90E-05	NA	NA
					GW - MW22 Total	3.50E-05			1.10E+00		
					SS + GW (MW15)	1.20E-04			1.60E+00		
					SS + GW (MW22)	4.30E-05			1.50E+00		
					SB + GW (MW15)	1.20E-04			1.60E+00		
					SB + GW (MW22)	4.30E-05			1.50E+00		

TABLE RA-S2-9.RME_0.8

**RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7.1.4.RME_0.8	Future	On-Site CI Worker	4	Surface Soil	Ingestion	1.90E-04	Aroclor 1260 Arsenic Benzo(a)pyrene	1.5E-04 3.8E-05 1.4E-06	1.20E+01	Aroclor 1260 Manganese	1.00E+01 1.40E+00	
					Dermal	1.50E-04	Aroclor 1260 Arsenic Benzo(a)pyrene	1.4E-04 9.5E-06 1.2E-06	9.60E+00	Aroclor 1260	9.50E+00	
					Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	7.70E-08	NA	NA	1.20E-01	NA	NA
					Surface Soil Total	3.40E-04				2.20E+01		
				Subsurface Soil	Ingestion	1.00E-04	Aroclor 1260 Arsenic	6.7E-05 3.1E-05	6.20E+00	Aroclor 1260	4.70E+00	
					Dermal	7.20E-05	Aroclor 1260 Arsenic	6.2E-05 7.8E-06	4.50E+00	Aroclor 1260	4.40E+00	
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.50E-08	NA	NA	7.30E-02	NA	NA	
					Subsurface Soil Total	1.70E-04				1.10E+01		
				Groundwater	Ingestion	3.80E-07	NA	NA	2.70E+00	Cadmium	2.10E+00	
				Outdoor Air Vapors -- Groundwater	Inhalation	--	NA	NA	--	NA	NA	
				Indoor Air Vapors -- Groundwater	Inhalation	--	NA	NA	--	NA	NA	
					GW Total	3.80E-07				2.70E+00		
					SS + GW	3.40E-04				2.50E+01		
					SB + GW	1.70E-04				1.30E+01		

TABLE RA-S2-10.RME_0.8

RISK AND HAZARD SUMMARY
 COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard																																												
S7.1.5.RME_0.8	Future	On-Site CI Worker	5	Surface Soil	Ingestion	5.60E-05	Benzo(a)pyrene Arsenic Aroclor 1248 Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	2.4E-05 8.8E-06 1.0E-05 3.7E-06 3.5E-06 3.4E-06 1.3E-06	1.20E+00	NA	NA																																												
							Dermal	4.30E-05				Benzo(a)pyrene Arsenic Aroclor 1248 Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	2.1E-05 2.2E-06 9.4E-06 3.2E-06 3.0E-06 2.9E-06 1.1E-06	7.00E-01	NA	NA																																							
												Outdoor Air Particulates and Vapors from Surface Soil	Inhalation				3.70E-07	NA	NA	7.10E+00	Cyanide	7.10E+00																																	
																							Surface Soil Total	1.00E-04			9.00E+00																												
																														Subsurface Soil	Ingestion	3.00E-05	Benzo(a)pyrene Arsenic Aroclor 1248 Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene	1.3E-05 7.9E-06 1.0E-06 2.1E-06 1.9E-06 1.8E-06	4.70E-01	NA	NA																		
																																	Dermal	2.00E-05				Benzo(a)pyrene Arsenic Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene	1.1E-05 1.9E-06 1.8E-06 1.6E-06 1.6E-06	1.10E-01	NA	NA													
																																						Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation				1.20E-06	NA	NA	4.20E+00	Cyanide	4.20E+00							
																																																	Subsurface Soil Total	5.10E-05			4.80E+00		

TABLE RA-S2-10.RME_0.8

RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
				Groundwater	Ingestion	1.10E-05	Vinyl Chloride Aroclor 1254 Trichloroethene	5.8E-06 2.0E-06 1.9E-06	4.40E-01	NA	NA
				Outdoor Air Vapors – Groundwater	Inhalation	1.20E-09	NA	NA	1.30E-06	NA	NA
				Indoor Air Vapors – Default Future Industrial	Inhalation	1.10E-06	NA	NA	2.10E-03	NA	NA
					GW - Future Ind Total	1.20E-05			4.40E-01		
				Indoor Air Vapors – Office SW	Inhalation	1.20E-06	NA	NA	2.30E-03	NA	NA
					GW - Office SW Total	1.20E-05			4.40E-01		
				Indoor Air Vapors – East Warehouse	Inhalation	2.80E-08	NA	NA	6.80E-05	NA	NA
					GW - EWH	1.10E-05			4.40E-01		
				Indoor Air Vapors – West Warehouse	Inhalation	3.80E-08	NA	NA	8.70E-05	NA	NA
					GW - WWWH Total	1.10E-05			4.40E-01		
					SS + GW (Def Ind)	1.10E-04			9.40E+00		
					SB + GW (Def Ind)	6.30E-05			5.20E+00		
					SS + GW (Office SW)	1.10E-04			9.40E+00		
					SB + GW (Office SW)	6.30E-05			5.20E+00		
					SS + GW (EWH)	1.10E-04			9.40E+00		
					SB + GW (EWH)	6.20E-05			5.20E+00		
					SS + GW (WWWH)	1.10E-04			9.40E+00		
					SB + GW (WWWH)	6.20E-05			5.20E+00		

TABLE RA-S2-11.RME_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 1
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.1.RME_0.8	Future	On-Site Utility Worker	1	Subsurface Soil	Ingestion	9.60E-06	Arsenic	7.0E-06	2.70E-01	NA	NA
					Dermal	1.80E-06	Benzo(a)pyrene	1.2E-06	2.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.60E-09	NA	NA	1.60E-02	NA	NA
					Subsurface Soil Total	1.10E-05			3.10E-01		
				GW, Trench (MW04)	Inhalation	4.30E-07	NA	NA	3.20E-03	NA	NA
					GW - MW4 Total	4.30E-07			3.20E-03		
				GW, Trench (MW31)	Inhalation	2.50E-09	NA	NA	1.40E-06	NA	NA
					GW - MW31 Total	2.50E-09			1.40E-06		
						SB + GW (MW04)	1.20E-05		3.10E-01		
						SB + GW (MW31)	1.10E-05		3.10E-01		

TABLE RA-S2-11B.RME_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard									
S7.2.1B.RME_0.8	Future	On-Site Utility Worker	1	Subsurface Soil	Ingestion	1.50E-04	Aroclor-1260	7.20E-06	5.10E+00	Cadmium	1.90E+00									
							Arsenic	9.00E-05												
							Benzo(a)anthracene	4.80E-06												
							Benzo(a)pyrene	3.10E-05												
							Benzo(b)fluoranthene	5.40E-06												
							Chromium, hexavalent	1.00E-06												
							Dibenzo(a,h)anthracene	5.20E-06												
							Indeno(1,2,3-cd)pyrene	1.80E-06												
														Aroclor-1260	3.00E-06					
														Arsenic	1.00E-05					
							Benzo(a)anthracene	1.90E-06												
							Benzo(a)pyrene	1.20E-05												
							Benzo(b)fluoranthene	2.10E-06												
							Dibenzo(a,h)anthracene	2.00E-06												
					Dermal	3.20E-05			5.20E-01	NA	NA									
					Outdoor Air Particulates and Vapors from Subsurface Soil															
					Inhalation	1.80E-07	NA	NA	2.60E-01	NA	NA									
						Subsurface Soil Total	1.80E-04		5.90E+00											
					GW, Trench (MW04)															
					Inhalation	4.30E-07	NA	NA	3.20E-03	NA	NA									
						GW - MW4 Total	4.30E-07		3.20E-03											
					GW, Trench (MW31)															
					Inhalation	2.50E-09	NA	NA	1.40E-06	NA	NA									
						GW - MW31 Total	2.50E-09		1.40E-06											
						SB + GW (MW04)	1.80E-04		5.90E+00											
						SB + GW (MW31)	1.80E-04		5.90E+00											

TABLE RA-S2-12.RME_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGLER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.2.RME_0.8	Future	On-Site Utility Worker	2	Subsurface Soil	Ingestion	1.70E-06	Arsenic	1.50E-06	9.70E-02	NA	NA
					Dermal	2.00E-07	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.50E-09	NA	NA	3.90E-04	NA	NA
					Subsurface Soil Total	1.90E-06			1.00E-01		
				Groundwater (MW15)	Ingestion	1.10E-07	NA	NA	1.20E-03	NA	NA
				Groundwater (MW15)	Dermal	3.00E-07	NA	NA	3.40E-03	NA	NA
				GW, Trench (MW15)	Inhalation	5.70E-09	NA	NA	--	NA	NA
					GW - MW15 Total	4.20E-07			4.60E-03		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	3.60E-09	NA	NA	4.90E-04	NA	NA
					GW - MW22 Total	3.60E-09			4.90E-04		
					SB + GW (MW15)	2.30E-06			1.10E-01		
					SB + GW (MW22)	1.90E-06			1.00E-01		

TABLE RA-S2-12B.RME_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.2B.RME_0.8	Future	On-Site Utility Worker	2	Subsurface Soil	Ingestion	1.10E-05	Arsenic	1.10E-05	3.50E-01	NA	NA
					Dermal	1.30E-06	Arsenic	1.20E-06	1.70E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.60E-09	NA	NA	1.20E-03	NA	NA
					Subsurface Soil Total	1.20E-05			3.70E-01		
				Groundwater (MW15)	Ingestion	1.10E-07	NA	NA	1.20E-03	NA	NA
				Groundwater (MW15)	Dermal	3.00E-07	NA	NA	3.40E-03	NA	NA
				GW, Trench (MW15)	Inhalation	5.70E-09	NA	NA	--	NA	NA
					GW - MW15 Total	4.20E-07			4.60E-03		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	3.60E-09	NA	NA	4.90E-04	NA	NA
					GW - MW22 Total	3.60E-09			4.90E-04		
					SB + GW (MW15)	1.30E-05			3.70E-01		
					SB + GW (MW22)	1.20E-05			3.70E-01		

TABLE RA-S2-13.RME_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.3.RME_0.8	Future	On-Site Utility Worker	3	Subsurface Soil	Ingestion	2.40E-06	Arsenic	2.20E-06	8.90E-02	NA	NA
					Dermal	2.80E-07	NA	NA	4.30E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.00E-09	NA	NA	3.80E-04	NA	NA
					Subsurface Soil Total	2.70E-06			9.40E-02		
				Groundwater	Ingestion	1.70E-09	NA	NA	1.90E-03	NA	NA
					Dermal	1.50E-07	NA	NA	1.50E-02	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	1.50E-07			1.60E-02		
					SB + GW	2.80E-06			1.10E-01		

TABLE RA-S2-13B.RME_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.3B.RME_0.8	Future	On-Site Utility Worker	3	Subsurface Soil	Ingestion	1.50E-05	Arsenic	1.40E-05	3.30E-01	NA	NA
					Dermal	1.60E-06	Arsenic	1.60E-06	1.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.10E-08	NA	NA	1.20E-03	NA	NA
					Subsurface Soil Total	1.60E-05			3.50E-01		
				Groundwater	Ingestion	1.70E-09	NA	NA	1.90E-03	NA	NA
				Groundwater	Dermal	1.50E-07	NA	NA	1.50E-02	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	1.40E-07			1.60E-02		
					SB + GW	1.70E-05			3.60E-01		

TABLE RA-S2-14.RME_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.4.RME_0.8	Future	On-Site Utility Worker	4	Subsurface Soil	Ingestion	2.70E-05	Aroclor 1260 Arsenic	1.8E-05 8.3E-06	1.60E+00	Aroclor 1260	1.20E+00
					Dermal	8.70E-06	Aroclor 1260	7.50E-06	5.40E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.60E-09	NA	NA	2.90E-03	NA	NA
				Subsurface Soil Total					3.60E-05		
No groundwater exposures, risks, hazards											

TABLE RA-S2-14B.RME_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.4B.RME_0.8	Future	On-Site Utility Worker	4	Subsurface Soil	Ingestion	5.50E-05	Aroclor 1260 Arsenic	3.90E-05 1.50E-05	3.60E+00	Aroclor 1260	2.70E+00
					Dermal	1.80E-05	Aroclor 1260 Arsenic	1.60E-05 1.60E-06	1.20E+00	Aroclor 1260	1.10E+00
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.50E-09	NA	NA	7.30E-03	NA	NA
				Subsurface Soil Total					7.30E-05		
No groundwater exposures, risks, hazards											

TABLE RA-S2-15.RME_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.5.RME_0.8	Future	On-Site Utility Worker	5	Subsurface Soil	Ingestion	7.80E-06	Benzo(a)pyrene Arsenic	3.4E-06 2.1E-06	1.20E-01	NA	NA
					Dermal	2.40E-06	Benzo(a)pyrene	1.30E-06	1.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.90E-08	NA	NA	1.70E-01	NA	NA
					Subsurface Soil Total	1.00E-05			3.10E-01		
				GW, Trench (MW29)	Inhalation	--	NA	NA	3.80E-04	NA	NA
					GW - MW29 Total	--			3.80E-04		
				GW, Trench (MW30)	Inhalation	1.60E-07	NA	NA	1.80E-04	NA	NA
					GW - MW30 Total	1.60E-07			1.80E-04		
					SB + GW (MW29)	1.00E-05			3.10E-01		
					SB + GW (MW30)	1.00E-05			3.10E-01		

TABLE RA-S2-15B.RME_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.5B.RME_0.8	Future	On-Site Utility Worker	5	Subsurface Soil	Ingestion	6.30E-05	Indeno(1,2,3-cd)pyrene	1.70E-06	6.60E-01	NA	NA
							Arsenic	1.00E-05			
							Benzo(a)anthracene	4.80E-06			
							Benzo(a)pyrene	3.30E-05			
							Benzo(b)fluoranthene	4.80E-06			
							Dibenzo(a,h)anthracene	4.90E-06			
							Aroclor-1248	1.10E-06			
							Arsenic	1.20E-06			
							Benzo(a)anthracene	1.90E-06			
							Benzo(a)pyrene	1.30E-05			
							Benzo(b)fluoranthene	1.90E-06			
							Dibenzo(a,h)anthracene	1.90E-06			
Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.70E-07	NA	NA	1.90E+00	Cyanide	1.90E+00				
Subsurface Soil Total						8.60E-05		2.70E+00			
GW, Trench (MW29)	Inhalation	–	NA	NA	3.80E-04	NA	NA				
GW - MW29 Total						–		3.80E-04			
GW, Trench (MW30)	Inhalation	1.60E-07	NA	NA	1.80E-04	NA	NA				
GW - MW30 Total						1.60E-07		1.80E-04			
SB + GW (MW29)						8.60E-05		2.70E+00			
SB + GW (MW30)						8.60E-05		2.70E+00			

TABLE RA-S2-16.RME_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 6
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.6.RME_0.8	Current/ Future	Utility Worker	6	Surface Soil	Ingestion	2.00E-06	Arsenic	1.80E-06	5.70E-02	NA	NA
					Dermal	2.00E-07	NA	NA	2.20E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-09	NA	NA	3.40E-04	NA	NA
				Surface Soil Total		2.20E-06			6.00E-02		
No groundwater exposures, risks, hazards											

TABLE RA-S2-16B.RME_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 6
REASONABLE MAXIMUM EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.6B.RME_0.8	Current/ Future	Utility Worker	6	Surface Soil	Ingestion	9.00E-06	Arsenic	8.60E-06	2.00E-01	NA	NA
					Dermal	9.70E-07	NA	NA	9.80E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.40E-09	NA	NA	1.30E-03	NA	NA
				Surface Soil Total		1.00E-05			2.10E-01		
No groundwater exposures, risks, hazards											

TABLE RA-S2-17.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 1
 REASONBALE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.1.RME_08	Future	On-Site Construction Worker	1	Subsurface Soil	Ingestion	1.20E-06	NA	NA	3.50E+00	NA	NA
					Dermal	2.30E-07	NA	NA	3.70E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.00E-09	NA	NA	2.00E+00	NA	NA
					Subsurface Soil Total	1.50E-06			5.80E+00		
				GW, Trench (MW04)	Inhalation	5.60E-08	NA	NA	4.20E-02	NA	NA
					GW - MW4 Total	5.60E-08			4.20E-02		
				GW, Trench (MW31)	Inhalation	3.30E-10	NA	NA	1.90E-05	NA	NA
					GW - MW31 Total	3.30E-10			1.90E-05		
					SB + GW (MW04)	1.50E-06			5.90E+00		
					SB + GW (MW31)	1.50E-06			5.80E+00		

TABLE RA-S2-17B.RME_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard							
S7.3.1B.RME_0.8	Future	On-Site Construction Worker	1	Subsurface Soil	Ingestion	1.90E-05	Arsenic Benzo(a)pyrene	1.20E-05 4.00E-06	6.60E+01	Antimony Aroclor-1260 Arsenic Cadmium Cobalt Manganese Mercury Zinc	8.80E+00 6.60E+00 7.30E+00 2.50E+01 2.90E+00 6.10E+00 1.70E+00 4.60E+00							
					Dermal	4.20E-06	Arsenic Benzo(a)pyrene	1.30E-06 1.60E-06			6.80E+00	Aroclor-1260 Cadmium	2.80E+00 3.00E+00					
					Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.20E-07	NA				NA	3.10E+01	Mercury	3.10E+01			
					Subsurface Soil Total		2.30E-05					NA				1.00E+02		
					GW, Trench (MW04)	Inhalation	5.60E-08	NA				NA				4.20E-02	NA	NA
					GW - MW4 Total		5.60E-08											
					GW, Trench (MW31)	Inhalation	3.30E-10	NA				NA				1.90E-05	NA	NA
					GW - MW31 Total		3.30E-10											
					SB + GW (MW04)		2.40E-05									1.00E+02		
					SB + GW (MW31)		2.30E-05									1.00E+02		

TABLE RA-S2-18.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.2.RME_0.8	Future	On-Site Construction Worker	2	Subsurface Soil	Ingestion	2.2E-07	NA	NA	1.30E+00	NA	NA
					Dermal	2.6E-08	NA	NA	6.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.40E-10	NA	NA	1.00E-02	NA	NA
					Subsurface Soil Total	2.40E-07			1.30E+00		
				Groundwater (MW15)	Ingestion	1.50E-08	NA	NA	1.60E-02	NA	NA
				Groundwater (MW15)	Dermal	3.90E-08	NA	NA	4.50E-02	NA	NA
				GW, Trench (MW15)	Inhalation	7.40E-10	NA	NA	--	NA	NA
					GW - MW4 Total	5.40E-08			6.00E-02		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	4.60E-10	NA	NA	6.40E-03	NA	NA
					GW - MW31 Total	4.60E-10			6.40E-03		
					SB + GW (MW15)	3.00E-07			1.40E+00		
					SB + GW (MW22)	2.50E-07			1.30E+00		

TABLE RA-S2-18B.RME_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.2B.RME_0.8	Future	On-Site Construction Worker	2	Subsurface Soil	Ingestion	1.5E-06	Arsenic	1.40E-06	4.60E+00	Zinc	1.50E+00
					Dermal	1.6E-07	NA	NA	2.20E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	3.10E-02	NA	NA
					Subsurface Soil Total	1.60E-06			4.80E+00		
				Groundwater (MW15)	Ingestion	1.50E-08	NA	NA	1.60E-02	NA	NA
				Groundwater (MW15)	Dermal	3.90E-08	NA	NA	4.50E-02	NA	NA
				GW, Trench (MW15)	Inhalation	7.40E-10	NA	NA	--	NA	NA
					GW - MW4 Total	5.40E-08			6.00E-02		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	4.60E-10	NA	NA	6.40E-03	NA	NA
					GW - MW31 Total	4.60E-10			6.40E-03		
					SB + GW (MW15)	1.70E-06			4.90E+00		
					SB + GW (MW22)	1.60E-06			4.80E+00		

TABLE RA-S2-19.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.3.RME_0.8	Future	On-Site Construction Worker	3	Subsurface Soil	Ingestion	3.10E-07	NA	NA	1.20E+00	NA	NA
					Dermal	3.60E-08	NA	NA	5.60E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	7.90E-10	NA	NA	1.00E-02	NA	NA
					Subsurface Soil Total	3.50E-07			1.20E+00		
				Groundwater	Ingestion	2.10E-10	NA	NA	2.50E-02	NA	NA
				Groundwater	Dermal	2.00E-08	NA	NA	1.90E-01	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	2.00E-08			2.10E-01		
					SB + GW	3.70E-07			1.10E+00		

TABLE RA-S2-19B.RME_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7.3.3B.RME_0.8	Future	On-Site Construction Worker	3	Subsurface Soil	Ingestion	1.90E-06	Arsenic	1.90E-06	4.30E+00	Arsenic	1.20E+00	
					Dermal	2.10E-07	NA	NA	2.50E-01	NA	NA	
					Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.90E-09	NA	NA	3.10E-02	NA	NA
					Subsurface Soil Total	2.10E-06			4.60E+00			
					Groundwater	Ingestion	2.10E-10	NA	NA	2.50E-02	NA	NA
					Groundwater	Dermal	2.00E-08	NA	NA	1.90E-01	NA	NA
					Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	2.00E-08			2.10E-01			
					SB + GW	2.20E-06			4.80E+00			

TABLE RA-S2-20.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.4.RME_0.8	Future	On-Site Construction Worker	4	Subsurface Soil	Ingestion	3.50E-06	Aroclor 1260 Arsenic	2.3E-06 1.1E-06	2.10E+01	Aroclor 1260 Manganese	1.6E+01 2.9E+00
					Dermal	1.10E-06	NA	NA		7.00E+00	Aroclor 1260
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.80E-10	NA	NA	7.60E-02	NA	NA
				Subsurface Soil Total					4.60E-06		

No groundwater exposures, risks, hazards

TABLE RA-S2-20B.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.4B.RME_0.8	Future	On-Site Construction Worker	4	Subsurface Soil	Ingestion	7.10E-06	Aroclor 1260 Arsenic	5.00E-06 1.90E-06	4.70E+01	Aroclor 1260 Arsenic Manganese	3.50E+01 1.20E+00 7.30E+00
					Dermal	2.40E-06	Aroclor 1260	2.10E-06	1.50E+01	Aroclor 1260	1.50E+01
					Inhalation	1.20E-09	NA	NA	1.90E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil							
Subsurface Soil Total						9.50E-06			6.20E+01		

No groundwater exposures, risks, hazards

TABLE RA-S2-21.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.5.RME_0.8	Future	On-Site Construction Worker	5	Subsurface Soil	Ingestion	1.00E-06	NA	NA	1.60E+00	NA	NA
					Dermal	3.10E-07	NA	NA	1.70E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.20E-08	NA	NA	2.20E+01	Cyanide	2.20E+01
					Subsurface Soil Total	1.40E-06			2.40E+01		
				GW, Trench (MW29)	Inhalation	--	NA	NA	5.00E-03	NA	NA
					GW - MW29 Total	--			5.00E-03		
				GW, Trench (MW30)	Inhalation	2.10E-08	NA	NA	2.30E-03	NA	NA
					GW - MW30 Total	2.10E-08			2.30E-03		
					SB + GW (MW29)	1.40E-06			2.40E+01		
					SB + GW (MW30)	1.40E-06			2.40E+01		

TABLE RA-S2-21B.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE -- MAXIMUM CONCENTRATIONS
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.5B.RME_0.8	Future	On-Site Construction Worker	5	Subsurface Soil	Ingestion	8.30E-06	Arsenic	1.30E-06	8.60E+00	Aroclor-1248	2.40E+00
					Dermal	2.80E-06	Benzo(a)pyrene	4.30E-06		Copper	1.10E+00
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	6.10E-07	NA	NA	2.50E+02	Cyanide	2.50E+02
				GW, Trench (MW29)	Inhalation	-	NA	NA	5.00E-03	NA	NA
				GW, Trench (MW30)	Inhalation	2.10E-08	NA	NA	2.30E-03	NA	NA
					SB + GW (MW29)	1.20E-05			2.60E+02		
					SB + GW (MW30)	1.20E-05			2.60E+02		

TABLE RA-S2-22.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 6
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.6.RME_0.8	Current/ Future	Construction Worker	6	Surface Soil	Ingestion	2.60E-07	NA	NA	7.50E-01	NA	NA
					Dermal	2.70E-08	NA	NA	2.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.90E-10	NA	NA	2.40E-02	NA	NA
				Surface Soil Total	2.80E-07			8.00E-01			
No groundwater exposures, risks, hazards											

TABLE RA-S2-22B.RME_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 6
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.6b.RME_0.8	Current/ Future	Construction Worker	6	Surface Soil	Ingestion	1.20E-06	Arsenic	1.10E-06	2.60E+00	NA	NA
					Dermal	1.30E-07	NA	NA	1.30E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9.00E-10	NA	NA	8.90E-02	NA	NA
				Surface Soil Total		1.30E-06			2.80E+00		
No groundwater exposures, risks, hazards											

TABLE RA-S2-23.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.1.RME_0.8	Current/ Future	Trespasser Adolescent	1	Surface Soil	Ingestion	5.90E-07	NA	NA	2.70E-02	NA	NA
					Dermal	1.50E-06	NA	NA	2.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.10E-09	NA	NA	3.60E-02	NA	NA
					Surface Soil Total	2.10E-06			9.10E-02		
				Subsurface Soil	Ingestion	4.40E-07	NA	NA	2.20E-02	NA	NA
					Dermal	1.10E-06	NA	NA	2.50E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.30E-09	NA	NA	2.70E-02	NA	NA
					Subsurface Soil Total	1.50E-06			7.30E-02		
				Surface Water	Ingestion	8.20E-08	NA	NA	4.80E-02	NA	NA
					Dermal	9.60E-07	NA	NA	2.40E-01	NA	NA
				Surface Water Total	1.00E-06			2.90E-01			
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.00E-10	NA	NA	2.30E-05	NA	NA
					GW - MW04 Total	1.00E-10			2.30E-05		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	3.00E-13	NA	NA	3.50E-10	NA	NA
					GW - MW31 Total	3.00E-13			3.50E-10		
					SS + SW + GW (MW04)	3.20E-06			3.80E-01		
					SB + SW + GW (MW04)	2.60E-06			3.70E-01		
					SS + SW + GW (MW31)	3.20E-06			3.80E-01		
					SB + SW + GW (MW31)	2.60E-06			3.70E-01		

TABLE RA-S2-24.RME_0.8

**RISK AND HAZARD SUMMARY
 ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.2.RME_0.8	Current/ Future	Trespasser Adolescent	2	Surface Soil	Ingestion	7.00E-08	NA	NA	8.60E-03	NA	NA
					Dermal	9.40E-08	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.90E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	1.70E-07			1.40E-02		
				Subsurface Soil	Ingestion	6.70E-08	NA	NA	7.90E-03	NA	NA
					Dermal	9.00E-08	NA	NA	6.80E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.80E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	1.60E-07			1.50E-02		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	2.20E-14	NA	NA	--	NA	NA
					GW - MW15 Total	2.20E-14			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	7.20E-13	NA	NA	9.90E-08	NA	NA
					GW - M22 Total	7.20E-13			9.90E-08		
					SS + GW (MW15)	1.70E-07			1.40E-02		
					SB + GW (MW15)	1.60E-07			1.50E-02		
					SS + GW (MW22)	1.70E-07			1.40E-02		
					SB + GW (MW22)	1.60E-07			1.50E-02		

TABLE RA-S2-25.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.3.RME_0.8	Current/ Future	Trespasser Adolescent	3	Surface Soil	Ingestion	1.00E-07	NA	NA	7.50E-03	NA	NA
					Dermal	1.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.20E-09	NA	NA	4.20E-04	NA	NA
						Surface Soil Total	2.40E-07		1.20E-02		
					Subsurface Soil	Ingestion	9.30E-08	NA	NA	7.50E-03	NA
				Dermal		1.20E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.30E-09	NA	NA	4.10E-04	NA	NA
						Subsurface Soil Total	2.20E-07		1.10E-02		
					Surface Water	Ingestion	5.40E-08	NA	NA	1.10E-02	NA
				Dermal		1.10E-07	NA	NA	1.10E-01	NA	NA
				Surface Water Total	1.70E-07		1.30E-01				
					SS + SW	4.10E-07		1.40E-01			
					SB + SW	3.80E-07		1.40E-01			

TABLE RA-S2-26.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.4.RME_0.8	Current/ Future	Trespasser Adolescent	4	Surface Soil	Ingestion	1.70E-06	Aroclor 1260	1.30E-06	2.70E-01	NA	NA
					Dermal	6.30E-06	Aroclor 1260	5.60E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	8.00E-06			1.30E+00		
					Subsurface Soil	9.20E-07	NA	NA	1.30E-01	NA	NA
				Subsurface Soil	Ingestion	9.20E-07	NA	NA	1.30E-01	NA	NA
					Dermal	3.20E-06	Aroclor 1260	2.60E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	4.10E-06			6.00E-01		
					Surface Soil Total	8.00E-06			1.30E+00		
				Subsurface Soil Total	4.10E-06			6.00E-01			

TABLE RA-S2-27.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.5.RME_0.8	Current/ Future	Trespasser Adolescent	5	Surface Soil	Ingestion	1.10E-06	NA	NA	2.60E-02	NA	NA
					Dermal	4.40E-06	Benzo(a)pyrene	2.60E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-08	NA	NA	4.80E-01	NA	NA
					Surface Soil Total	5.50E-06			5.80E-01		
					Subsurface Soil	Ingestion	6.00E-07	NA	NA	1.00E-02	NA
				Dermal		2.20E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-08	NA	NA	2.90E-01	NA	NA
					Subsurface Soil Total	2.90E-06			3.10E-01		
					Surface Water	Ingestion	2.80E-08	NA	NA	4.70E-04	NA
				Dermal		1.10E-07	NA	NA	4.20E-04	NA	NA
				Surface Water Total	1.40E-07			8.80E-04			
				Groundwater Outdoor Air Vapors-- MW30	Inhalation	2.70E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	2.70E-11			5.50E-08		
					SS + SW + GW (MW30)	5.60E-06			5.80E-01		
				SB + SW + GW (MW30)	3.00E-06			3.10E-01			

TABLE RA-S2-28.RME_0.8

**RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.5.1.RME_0.8	Current/ Future	Trespasser Adult	1	Surface Soil	Ingestion	1.20E-06	NA	NA	2.70E-02	NA	NA			
					Dermal	2.40E-06	Arsenic	1.10E-06	2.80E-02	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.20E-08	NA	NA	2.10E-02	NA	NA			
						Surface Soil Total	3.70E-06		7.60E-02					
						Subsurface Soil	Ingestion	9.40E-07	NA	NA	2.20E-02	NA	NA	
				Dermal	1.80E-06		NA	NA	2.50E-02	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8.40E-09	NA	NA	1.60E-02	NA	NA			
						Subsurface Soil Total	2.80E-06		6.20E-02					
						Surface Water	Ingestion	1.80E-07	NA	NA	4.80E-02	NA	NA	
				Dermal	1.10E-06		NA	NA	2.40E-01	NA	NA			
				Surface Water Total	1.20E-06		2.90E-01							
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.60E-10	NA	NA	2.30E-05	NA	NA			
						GW - MW04 Total	1.60E-10		2.30E-05					
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	9.10E-13	NA	NA	3.50E-10	NA	NA			
						GW - MW31 Total	9.10E-13		3.50E-10					
										SS + SW + GW (MW04)		3.70E-01		
										SB + SW + GW (MW04)		3.50E-01		
										SS + SW + GW (MW31)		3.70E-01		
										SB + SW + GW (MW31)		3.50E-01		

TABLE RA-S2-29.RME_0.8

**RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.2.RME_0.8	Current/ Future	Trespasser Adult	2	Surface Soil	Ingestion	1.70E-07	NA	NA	8.60E-03	NA	NA
					Dermal	2.20E-07	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.50E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	3.90E-07			1.40E-02		
				Subsurface Soil	Ingestion	1.60E-07	NA	NA	7.90E-03	NA	NA
					Dermal	2.10E-07	NA	NA	4.00E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.20E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	3.70E-07			1.20E-02		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	6.70E-14	NA	NA	--	NA	NA
					GW - MW15 Total	6.70E-14			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	3.90E-13	NA	NA	9.70E-08	NA	NA
					GW - M22 Total	3.90E-13			9.70E-08		
					SS + GW (MW15)	3.90E-07			1.40E-02		
					SB + GW (MW15)	3.70E-07			1.20E-02		
					SS + GW (MW22)	3.90E-07			1.40E-02		
					SB + GW (MW22)	3.70E-07			1.20E-02		

TABLE RA-S2-30.RME_0.8

**RISK AND HAZARD SUMMARY
 ADULT TRESPASSER, OU2 EXPOSURE AREA 3
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.3.RME_0.8	Current/ Future	Trespasser Adult	3	Surface Soil	Ingestion	2.70E-07	NA	NA	7.50E-03	NA	NA
					Dermal	3.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.90E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	6.10E-07			1.20E-02		
					Subsurface Soil	Ingestion	2.30E-07	NA	NA	7.30E-03	NA
				Dermal		2.90E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.90E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	5.30E-07			1.10E-02		
					Surface Water	Ingestion	1.50E-07	NA	NA	2.10E-02	NA
				Dermal		1.50E-07	NA	NA	1.10E-01	NA	NA
				Surface Water Total	3.00E-07			1.30E-01			
					SS + SW	9.10E-07			1.40E-01		
					SB + SW	8.30E-07			1.40E-01		

TABLE RA-S2-31.RME_0.8

RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 4
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.4.RME_0.8	Current/ Future	Trespasser Adult	4	Surface Soil	Ingestion	4.90E-06	Aroclor 1260	3.80E-06	2.70E-01	NA	NA
					Dermal	1.80E-05	Aroclor 1260 Arsenic	1.7E-05 1.2E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	2.30E-05			1.30E+00		
				Subsurface Soil	Ingestion	2.60E-06	Aroclor 1260	1.70E-06	1.30E-01	NA	NA
					Dermal	9.00E-06	Aroclor 1260	7.80E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	1.20E-05			6.00E-01		
						Surface Soil Total	2.30E-05		1.30E+00		
						Subsurface Soil Total	1.20E-05		6.00E-01		

TABLE RA-S2-32.RME_0.8

RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.5.5.RME_0.8	Current/ Future	Trespasser Adult	5	Surface Soil	Ingestion	1.50E-06	NA	NA	2.60E-02	NA	NA
					Dermal	5.40E-06	Benzo(a)pyrene Aroclor 1248	2.6E-06 1.2E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.80E-08	NA	NA	2.80E-01	NA	NA
					Surface Soil Total	6.80E-06			3.80E-01		
				Subsurface Soil	Ingestion	7.70E-07	NA	NA	1.00E-02	NA	NA
					Dermal	2.50E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.80E-08	NA	NA	1.70E-01	NA	NA
					Subsurface Soil Total	3.30E-06			1.90E-01		
				Surface Water	Ingestion	7.80E-08	NA	NA	4.70E-04	NA	NA
					Dermal	1.60E-07	NA	NA	4.20E-04	NA	NA
					Surface Water Total	2.40E-07			8.80E-04		
				Groundwater Outdoor Air Vapors-- MW30	Inhalation	6.30E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	6.30E-11			5.50E-08		
					SS + SW + GW (MW30)	7.10E-06			3.80E-01		
					SB + SW + GW (MW30)	3.60E-06			1.90E-01		

TABLE RA-S2-33.RME_0.8

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard				
S7.6.1.RME_0.8	Future	Child Recreationalist	1	Surface Soil	Ingestion	4.50E-06	Arsenic Benzo(a)pyrene	1.6E-06 1.8E-06	2.50E-01	NA	NA				
					Dermal	9.30E-06	Benzo(a)pyrene Arsenic	5.2E-06 1.4E-06				1.90E-01	NA	NA	
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5.00E-09	NA	NA	4.60E-02	NA	NA				
					Surface Soil Total	1.40E-05			4.80E-01						
				Subsurface Soil	Ingestion	3.30E-06	Arsenic Benzo(a)pyrene	1.3E-06 1.2E-06	2.00E-01	NA	NA				
					Dermal	6.60E-06	Benzo(a)pyrene Arsenic	3.5E-06 1.1E-06				1.60E-01	NA	NA	
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.50E-09	NA	NA	3.40E-02	NA	NA				
					Subsurface Soil Total	9.90E-06			4.00E-01						
				Surface Water	Ingestion	1.80E-07	NA	NA	1.30E-01	NA	NA				
					Dermal	1.80E-06	NA	NA	4.30E-01	NA	NA				
				Surface Water Total	1.90E-06			5.60E-01							
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	9.70E-11	NA	NA	2.30E-05	NA	NA				
					GW - MW04 Total	9.70E-11			2.30E-05						
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	1.80E-13	NA	NA	3.50E-10	NA	NA				
					GW - MW31 Total	1.80E-13			3.50E-10						
										SS + SW + GW (MW04)	1.60E-05	1.00E+00			
										SB + SW + GW (MW04)	1.20E-05	9.60E-01			
										SS + SW + GW (MW31)	1.60E-05	1.00E+00			
										SB + SW + GW (MW31)	1.20E-05	9.60E-01			

TABLE RA-S2-34.RME_0.8

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.2.RME_0.8	Future	Child Recreationalist	2	Surface Soil	Ingestion	4.80E-07	NA	NA	8.10E-02	NA	NA
					Dermal	4.70E-07	NA	NA	3.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.60E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	9.40E-07			1.10E-01		
					Subsurface Soil	Ingestion	4.60E-07	NA	NA	7.40E-02	NA
				Dermal		4.50E-07	NA	NA	2.60E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.60E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	9.10E-07			1.00E-01		
					Groundwater Outdoor Air Vapors-- MW15	Inhalation	1.30E-14	NA	NA	--	NA
				GW - MW15 Total		1.30E-14			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	4.30E-13	NA	NA	9.90E-08	NA	NA
					GW - M22 Total	4.30E-13			9.90E-08		
					SS + GW (MW15)	9.40E-07			1.10E-01		
					SB + GW (MW15)	9.10E-07			1.00E-01		
					SS + GW (MW22)	9.40E-07			1.10E-01		
					SB + GW (MW22)	9.10E-07			1.00E-01		

TABLE RA-S2-35.RME_0.8

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.3.RME_0.8	Future	Child Recreationalist	3	Surface Soil	Ingestion	6.80E-07	NA	NA	7.00E-02	NA	NA
					Dermal	6.40E-07	NA	NA	2.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	1.30E-06			1.00E-01		
					Subsurface Soil	Ingestion	6.20E-07	NA	NA	6.80E-02	NA
				Dermal		5.80E-07	NA	NA	2.40E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.00E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	1.20E-06			9.20E-02		
					Surface Water	Ingestion	9.50E-08	NA	NA	5.80E-02	NA
				Dermal		2.00E-07	NA	NA	1.90E-01	NA	NA
					Surface Water Total	2.90E-07			2.50E-01		
					SS + SW	1.60E-06			3.50E-01		
					SB + SW	1.50E-06			3.40E-01		

TABLE RA-S2-36.RME_0.8

RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.4.RME_0.8	Future	Child Recreationalist	4	Surface Soil	Ingestion	9.80E-06	Aroclor 1260	7.10E-06	2.50E+00	Aroclor 1260	2.10E+00
					Dermal	2.60E-05	Aroclor 1260 Arsenic Benzo(a)pyrene	2.2E-05 1.6E-06 1.0E-06	6.50E+00	Aroclor 1260	6.50E+00
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.60E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	3.50E-05			9.00E+00		
				Subsurface Soil	Ingestion	5.50E-06	Aroclor 1260 Arsenic	3.2E-06 1.5E-06	1.20E+00	NA	NA
					Dermal	1.30E-05	Aroclor 1260 Arsenic	1.0E-05 1.3E-06	3.00E+00	Aroclor 1260	3.00E+00
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.50E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	1.90E-05			4.30E+00		
					Surface Soil Total	3.50E-05			9.00E+00		
					Subsurface Soil Total	1.90E-05			4.30E+00		

TABLE RA-S2-36A.RME_0.8

RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGLER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.5.RME_0.8	Future	Child Recreationalist	5	Surface Soil	Ingestion	1.00E-05	Benzo(a)pyrene	6.20E-06	2.40E-01	NA	NA
					Dermal	2.90E-05	Benzo(a)pyrene Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene Aroclor 1248	1.8E-05 2.8E-06 2.6E-06 2.5E-06 1.5E-06	4.80E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	8.70E-09	NA	NA	6.20E-01	NA	NA
					Surface Soil Total	3.90E-05			1.30E+00		
				Subsurface Soil	Ingestion	5.60E-06	Benzo(a)pyrene	3.30E-06	9.40E-02	NA	NA
					Dermal	1.50E-05	Benzo(a)pyrene Dibenzo(a,h)anthracene Benzo(b)fluoranthene Benzo(a)anthracene	9.7E-06 1.6E-06 1.4E-06 1.4E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.60E-08	NA	NA	3.70E-01	NA	NA
					Subsurface Soil Total	2.10E-05			5.40E-01		
				Surface Water	Ingestion	5.10E-08	NA	NA	1.30E-03	NA	NA
					Dermal	1.80E-07	NA	NA	7.40E-04	NA	NA
					Surface Water Total	2.30E-07			2.10E-03		
				Groundwater Outdoor Air Vapors – MW30	Inhalation	2.10E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	2.10E-11			5.50E-08		
					Surface Soil Total	4.00E-05			1.30E+00		
					Subsurface Soil Total	2.10E-05			5.40E-01		

TABLE RA-S2-37.RME_0.8

**RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 7
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.7.RME_0.8	Current/ Future	Child Recreationalist	7	Surface Soil	Ingestion	8.00E-07	NA	NA	9.80E-02	NA	NA
					Dermal	5.60E-07	NA	NA	4.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.20E-09	NA	NA	7.50E-04	NA	NA
				Surface Soil Total	1.40E-06			1.40E-01			
				Surface Soil Total	1.40E-06			1.40E-01			

TABLE RA-S2-38.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.1.RME_0.8	Future	Adolescent Recreationalist	1	Surface Soil	Ingestion	5.90E-07	NA	NA	2.70E-02	NA	NA
					Dermal	1.50E-06	NA	NA	2.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.10E-09	NA	NA	3.60E-02	NA	NA
					Surface Soil Total	2.10E-06			9.10E-02		
				Subsurface Soil	Ingestion	4.40E-07	NA	NA	2.20E-02	NA	NA
					Dermal	1.40E-06	NA	NA	3.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.30E-09	NA	NA	2.70E-02	NA	NA
					Subsurface Soil Total	1.80E-06			7.90E-02		
				Surface Water	Ingestion	8.20E-08	NA	NA	4.80E-02	NA	NA
					Dermal	9.50E-07	NA	NA	2.40E-01	NA	NA
					Surface Water Total	1.00E-06			2.90E-01		
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.00E-10	NA	NA	7.70E-06	NA	NA
					GW - MW04 Total	1.00E-10			7.70E-06		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	3.00E-13	NA	NA	1.20E-10		
					GW - MW31 Total	3.00E-13			1.20E-10		
					SS + SW + GW (MW04)	3.20E-06			3.80E-01		
					SB + SW + GW (MW04)	2.80E-06			3.70E-01		
					SS + SW + GW (MW31)	3.20E-06			3.80E-01		
					SB + SW + GW (MW31)	2.80E-06			3.70E-01		

TABLE RA-S2-39.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 2
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.2.RME_0.8	Future	Adolescent Recreationalist	2	Surface Soil	Ingestion	7.00E-08	NA	NA	8.60E-03	NA	NA
					Dermal	9.40E-08	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.90E-09	NA	NA	4.40E-04	NA	NA
						Surface Soil Total	1.70E-07		1.40E-02		
						Subsurface Soil	Ingestion	6.70E-08	NA	NA	7.90E-03
				Dermal	9.00E-08			NA	NA	4.00E-03	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.80E-09	NA	NA	4.20E-04	NA	NA
						Subsurface Soil Total	1.60E-07		1.20E-02		
						Groundwater Outdoor Air Vapors-- MW15	Inhalation	2.20E-14	NA	NA	--
				GW - MW15 Total	2.20E-14				--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	1.30E-13	NA	NA	9.70E-08	NA	NA
						GW - M22 Total	1.30E-13		9.70E-08		
						SS + GW (MW15)	1.70E-07		1.40E-02		
				SB + GW (MW15)	1.60E-07		1.20E-02				
				SS + GW (MW22)	1.70E-07		1.40E-02				
				SB + GW (MW22)	1.60E-07		1.20E-02				

TABLE RA-S2-40.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.3.RME_0.8	Future	Adolescent Recreationalist	3	Surface Soil	Ingestion	1.00E-07	NA	NA	7.50E-03	NA	NA
					Dermal	1.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.20E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	2.40E-07			1.20E-02		
				Subsurface Soil	Ingestion	9.30E-08	NA	NA	7.50E-03	NA	NA
					Dermal	1.20E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.30E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	2.20E-07			1.10E-02		
				Surface Water	Ingestion	5.40E-08	NA	NA	2.10E-02	NA	NA
					Dermal	1.10E-07	NA	NA	1.10E-01	NA	NA
					Surface Water Total	1.70E-07			1.30E-01		
					SS + SW	4.10E-07			1.40E-01		
					SB + SW	3.80E-07			1.40E-01		

TABLE RA-S2-41.RME_0.8

**RISK AND HAZARD SUMMARY
 ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.4.RME_0.8	Future	Adolescent Recreationalist	4	Surface Soil	Ingestion	1.70E-06	Aroclor 1260	1.30E-06	2.70E-01	NA	NA
					Dermal	6.30E-06	Aroclor 1260	5.60E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	8.00E-06			1.30E+00		
					Subsurface Soil	Ingestion	9.20E-07	NA	NA	1.30E-01	NA
				Dermal		3.20E-06	Aroclor 1260	2.60E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	4.10E-06			6.00E-01		
					Surface Soil Total	8.00E-06			1.30E+00		
				Subsurface Soil Total	4.10E-06			6.00E-01			

TABLE RA-S2-41A.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 5
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.5.RME_0.8	Future	Adolescent Recreationalist	5	Surface Soil	Ingestion	1.10E-06	NA	NA	2.60E-02	NA	NA
					Dermal	4.40E-06	Benzo(a)pyrene	2.60E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-08	NA	NA	4.80E-01	NA	NA
					Surface Soil Total	5.50E-06			5.80E-01		
					Subsurface Soil	Ingestion	6.80E-07	NA	NA	1.00E-02	NA
					Dermal	2.20E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
					Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-08	NA	NA	2.90E-01	NA
					Subsurface Soil Total	2.90E-06			3.10E-01		
				Surface Water	Ingestion	2.80E-08	NA	NA	4.70E-04	NA	NA
					Dermal	1.10E-07	NA	NA	4.20E-04	NA	NA
					Surface Water Total	1.30E-07			8.80E-04		
				Groundwater Outdoor Air Vapors -- MW30	Inhalation	2.70E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	2.70E-11			5.50E-08		
					SS + SW + GW (MW30)	5.60E-06			5.80E-01		
					SB + SW + GW (MW30)	3.00E-06			3.10E-01		

TABLE RA-S2-42.RME_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 7
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.7.RME_0.8	Current/ Future	Adolescent Recreationalist	7	Surface Soil	Ingestion	1.30E-07	NA	NA	1.10E-02	NA	NA
					Dermal	1.40E-07	NA	NA	6.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.50E-09	NA	NA	7.50E-04	NA	NA
				Surface Soil Total	2.80E-07			1.80E-02			
				Surface Soil Total	2.80E-07			1.80E-02			

TABLE RA-S2-43.RME_0.8

RISK AND HAZARD SUMMARY
ADULT RECREATIONALIST, OU2 EXPOSURE AREA 1
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGLER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.1.RME_0.8	Future	Adult Recreationalist	1	Surface Soil	Ingestion	1.20E-06	NA	NA	2.70E-02	NA	NA
					Dermal	2.40E-06	Arsenic	1.10E-06	2.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.20E-08	NA	NA	2.10E-02	NA	NA
					Surface Soil Total	3.70E-06			7.60E-02		
				Subsurface Soil	Ingestion	9.40E-07	NA	NA	2.20E-02	NA	NA
					Dermal	1.80E-06	NA	NA	2.50E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8.40E-09	NA	NA	1.60E-02	NA	NA
					Subsurface Soil Total	2.80E-06			6.20E-02		
				Surface Water	Ingestion	1.80E-07	NA	NA	4.80E-02	NA	NA
					Dermal	1.10E-06	NA	NA	2.40E-01	NA	NA
				Surface Water Total	1.20E-06			2.90E-01			
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	1.60E-10	NA	NA	2.30E-05	NA	NA
					GW - MW04 Total	1.60E-10			2.30E-05		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	9.10E-13	NA	NA	3.50E-10	NA	NA
					GW - MW31 Total	9.10E-13			3.50E-10		
					SS + SW + GW (MW04)	4.90E-06			3.70E-01		
					SB + SW + GW (MW04)	4.00E-06			3.50E-01		
					SS + SW + GW (MW31)	4.90E-06			3.70E-01		
					SB + SW + GW (MW31)	4.00E-06			3.50E-01		

TABLE RA-S2-44.RME_0.8

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.2.RME_0.8	Future	Adult Recreationalist	2	Surface Soil	Ingestion	1.70E-07	NA	NA	8.60E-03	NA	NA
					Dermal	2.20E-07	NA	NA	4.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.50E-09	NA	NA	4.40E-04	NA	NA
					Surface Soil Total	3.90E-07			1.40E-02		
				Subsurface Soil	Ingestion	1.60E-07	NA	NA	7.90E-03	NA	NA
					Dermal	2.10E-07	NA	NA	4.00E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.20E-09	NA	NA	4.20E-04	NA	NA
					Subsurface Soil Total	3.70E-07			1.20E-02		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	3.30E-11	NA	NA	--	NA	NA
					GW - MW15 Total	3.30E-11			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	2.40E-12	NA	NA	9.70E-08	NA	NA
					GW - M22 Total	2.40E-12			9.70E-08		
					SS + GW (MW15)	3.90E-07			1.40E-02		
					SB + GW (MW15)	3.70E-07			1.20E-02		
					SS + GW (MW22)	3.90E-07			1.40E-02		
					SB + GW (MW22)	3.70E-07			1.20E-02		

TABLE RA-S2-45.RME_0.8

**RISK AND HAZARD SUMMARY
ADULT RECREATIONALIST, OU2 EXPOSURE AREA 3
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.3.RME_0.8	Future	Adult Recreationalist	3	Surface Soil	Ingestion	2.70E-07	NA	NA	7.50E-03	NA	NA
					Dermal	3.30E-07	NA	NA	4.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.90E-09	NA	NA	4.20E-04	NA	NA
					Surface Soil Total	6.10E-07			1.20E-02		
					Subsurface Soil	Ingestion	2.30E-07	NA	NA	7.50E-03	NA
				Dermal		2.90E-07	NA	NA	3.70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.90E-09	NA	NA	4.10E-04	NA	NA
					Subsurface Soil Total	5.30E-07			1.10E-02		
					Surface Water	Ingestion	1.50E-07	NA	NA	2.10E-02	NA
				Dermal		1.50E-07	NA	NA	1.10E-01	NA	NA
				Surface Water Total	3.00E-07			1.30E-01			
					SS + SW	9.10E-07			1.40E-01		
					SB + SW	8.30E-07			1.40E-01		

TABLE RA-S2-46.RME_0.8

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 4
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.4.RME_0.8	Future	Adult Recreationalist	4	Surface Soil	Ingestion	4.90E-06	Aroclor 1260	3.80E-06	2.70E-01	NA	NA
					Dermal	1.80E-05	Aroclor 1260 Arsenic	1.7E-05 1.2E-06	1.00E+00	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.00E-09	NA	NA	5.00E-03	NA	NA
					Surface Soil Total	2.30E-05			1.30E+00		
				Subsurface Soil	Ingestion	2.60E-06	Aroclor 1260	1.70E-06	1.30E-01	NA	NA
					Dermal	9.00E-06	Aroclor 1260	7.80E-06	4.60E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.40E-09	NA	NA	3.10E-03	NA	NA
					Subsurface Soil Total	1.20E-05			6.00E-01		
				Surface Soil Total	2.30E-05			1.30E+00			
				Subsurface Soil Total	1.20E-05			6.00E-01			

TABLE RA-S2-46A.RME_0.8

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 5
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.5.RME_0.8	Future	Adult Recreationalist	5	Surface Soil	Ingestion	1.50E-06	NA	NA	2.60E-02	NA	NA
					Dermal	5.40E-06	Benzo(a)pyrene Aroclor 1248	2.6E-06 1.2E-06	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.80E-08	NA	NA	2.80E-01	NA	NA
					Surface Soil Total	6.80E-06			3.80E-01		
				Subsurface Soil	Ingestion	7.70E-07	NA	NA	1.00E-02	NA	NA
					Dermal	2.50E-06	Benzo(a)pyrene	1.40E-06	1.10E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.80E-08	NA	NA	1.70E-01	NA	NA
					Subsurface Soil Total	3.30E-06			1.90E-01		
				Surface Water	Ingestion	7.80E-08	NA	NA	4.70E-04	NA	NA
					Dermal	1.60E-07	NA	NA	4.20E-04	NA	NA
					Surface Water Total	2.40E-07			8.80E-04		
				Groundwater Outdoor Air Vapors -- MW30	Inhalation	6.30E-11	NA	NA	5.50E-08	NA	NA
					GW - MW30 Total	6.30E-11			5.50E-08		
					Surface Soil Total	7.10E-06			3.80E-01		
					Subsurface Soil Total	3.60E-06			1.90E-01		

TABLE RA-S2-47.RME_0.8

RISK AND HAZARD SUMMARY
ADULT RECREATIONIST, OU2 EXPOSURE AREA 7
REASONABLE MAXIMUM EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.8.7.RME_0.8	Current/ Future	Adult Recreationalist	7	Surface Soil	Ingestion	3.70E-07	NA	NA	1.00E-02	NA	NA
					Dermal	4.30E-07	NA	NA	6.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.60E-09	NA	NA	7.50E-04	NA	NA
				Surface Soil Total	8.00E-07			1.80E-02			
				Surface Soil Total	8.00E-07			1.80E-02			

TABLE RA-S2-49.RME_0.8

RISK AND HAZARD SUMMARY
 RESIDENTIAL EXPOSURE, OU2 EXPOSURE AREA 2
 REASONABLE MAXIMUM EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.9.2.RME_0.8	Future	Resident	2	Surface Soil	Ingestion	4.10E-05	Arsenic Chromium, hexavalent Benzo(a)pyrene	2.7E-05 8.3E-06 3.9E-06	5.20E+00	Cadmium	1.7			
					Dermal	5.40E-06	Arsenic Benzo(a)pyrene	3.2E-06 1.5E-06						
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.00E-07	NA	NA	2.40E-02	NA	NA			
						Homegrown Produce from Surface Soil	Ingestion	1.40E-04	Arsenic Chromium, hexavalent Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	7.8E-05 1.0E-05 2.7E-05 1.9E-05 1.0E-06	7.60E+01	Cadmium Zinc Copper Antimony	39 28 4.1 3.0	
				Surface Soil Total	1.70E-04			7.90E+01						
				Subsurface Soil	Ingestion	3.90E-05	Arsenic Chromium, hexavalent Benzo(a)pyrene	2.5E-05 8.3E-06 3.9E-06	3.40E+00	Cadmium	1.5			
					Dermal	5.20E-06	Arsenic Benzo(a)pyrene	3.0E-06 1.5E-06						
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.90E-07	NA	NA	2.30E-02	NA	NA			
				Homegrown Produce from Subsurface Soil	Ingestion	1.30E-04	Arsenic Chromium, hexavalent Benzo(a)anthracene Benzo(b)fluoranthene Benzo(a)pyrene Indeno	7.3E-05 1.0E-05 4.6E-06 2.7E-05 1.9E-05 1.0E-06	6.40E+01	Cadmium Zinc Copper Antimony	33 24 3.0 3.0			
						Subsurface Soil Total	1.80E-04						6.90E+01	
				GW - MW15	Ingestion	4.90E-04	Arsenic Chromium, hexavalent	4.7E-04 2.0E-05	7.90E+00	Arsenic Cobalt	4.5 1.2			
						Dermal	2.40E-05	Arsenic Chromium, hexavalent Pentachlorophenol				2.7E-06 9.9E-06 1.20E-05	2.20E-01	NA NA
						Inhalation	6.60E-12	NA				NA		
				Indoor Air (Household Use) from MW15	Inhalation	4.10E-08	NA	NA	-	NA	NA			
				Indoor Air (Vapor Intrusion) from MW15	Inhalation	1.70E-09	NA	NA	-	NA	NA			
				GW - MW15 Total		5.10E-04			8.00E+00					
				GW - MW22	Ingestion	2.60E-04	Arsenic delta-BHC Chromium, hexavalent Indeno(1,2,3-cd)pyrene delta-BHC	9.1E-05 1.4E-06 1.7E-04 7.6E-06 1.1E-06	6.90E+00	Iron Aluminum	2.2 2.1			
						Dermal	9.30E-05	Chromium, hexavalent Heptachlor epoxide				8.2E-05 1.0E-06	3.00E-01	NA NA
						Inhalation	2.10E-10	NA				NA		
				Indoor Air (Household Use) from MW22	Inhalation	2.90E-06	NA	NA	6.20E-03	NA	NA			
				Indoor Air (Vapor Intrusion) from MW22	Inhalation	1.10E-07	NA	NA	1.20E-03	NA	NA			
				GW - MW22 Total		3.60E-04			7.30E+00					
				SS + GW (MW15)		7.00E-04			8.90E+01					
				SB + GW (MW15)		6.90E-04			7.70E+01					
				SS + GW (MW22)		5.50E-04			8.80E+01					
				SB + GW (MW22)		5.40E-04			7.70E+01					

TABLE RA-S2-7.CTE_0.8

RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, IL

RAGS D Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.1.1.CTE_0.8	Future	On-Site CI Worker	1	Surface Soil	Ingestion	7.50E-06	Arsenic	5.4E-06	5.40E-01	NA	NA
					Dermal	6.10E-07	Benzo(a)pyrene	1.1E-06			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	8.90E-08	NA	NA	7.70E-01	NA	NA
						Surface Soil Total	8.20E-06				
				Subsurface Soil	Ingestion	5.70E-06	Arsenic	4.20E-06	4.40E-01	NA	NA
					Dermal	4.60E-07	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.90E-08	NA	NA	5.70E-01	NA	NA
						Subsurface Soil Total	6.30E-06				
				GW - MW4	Ingestion	1.60E-05	Vinyl Chloride Trichloroethene	1.4E-05 1.0E-06	2.10E+02	Cobalt Manganese	200 5.5
				Outdoor Air Vapors -- MW4	Inhalation	1.00E-09	NA	NA			
				Indoor Air Vapors -- MW4	Inhalation	6.90E-07	NA	NA	1.20E-02	NA	NA
				GW - MW4 Total		1.60E-05			2.10E+02		
				GW - MW31	Ingestion	8.40E-08	NA	NA	1.30E+01	Cadmium Zinc	7.5E+00 3.7E+00
				Outdoor Air Vapors -- MW31	Inhalation	5.60E-12	NA	NA			
				Indoor Air Vapors -- MW31	Inhalation	3.50E-09	NA	NA	5.20E-06	NA	NA
				GW - MW31 Total		8.70E-08			1.30E+01		
						SS + GW (MW4)			2.40E-05		2.10E+02
						SS + GW (MW31)			8.20E-06		1.50E+01
						SB + GW (MW4)			2.30E-05		2.10E+02
						SB + GW (MW31)			6.30E-06		1.40E+01

TABLE RA-S2-8.CTE_0.8

**RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.1.2.CTE_0.8	Future	On-Site CI Worker	2	Surface Soil	Ingestion	1.10E-06	NA	NA	1.80E-01	NA	NA
					Dermal	5.50E-08	NA	NA	3.90E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.10E-08	NA	NA	8.90E-03	NA	NA
						Surface Soil Total	1.10E-06			1.90E-01	
				Subsurface Soil	Ingestion	1.00E-06	NA	NA	1.60E-01	NA	NA
					Dermal	5.20E-08	NA	NA	3.30E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.00E-08	NA	NA	8.50E-03	NA	NA
						Subsurface Soil Total	1.10E-06			1.70E-01	
				GW - MW15	Ingestion	3.50E-05	Arsenic	3.50E-05	1.00E+00	NA	NA
				Outdoor Air Vapors - MW15	Inhalation	4.10E-13	NA	NA	--	NA	NA
						Indoor Air Vapors - MW15	Inhalation	1.10E-11	NA	NA	--
				GW - MW15 Total		3.50E-05			1.00E+00		
				GW - MW22	Ingestion	1.10E-05	Arsenic Chromium, hexavalent	6.80E-06 4.00E-06	9.30E-01	NA	NA
				Outdoor Air Vapors - MW22	Inhalation	1.30E-11	NA	NA	2.00E-06	NA	NA
						Indoor Air Vapors - MW22	Inhalation	6.60E-10	NA	NA	6.00E-05
				GW - MW22 Total		1.10E-05			9.30E-01		
					SS + GW (MW15)	3.60E-05			1.20E+00		
					SS + GW (MW22)	1.20E-05			1.10E+00		
					SB + GW (MW15)	3.60E-05			1.20E+00		
					SB + GW (MW22)	1.20E-05			1.10E+00		

TABLE RA-S2-9.CTE_0.8

RISK AND HAZARD SUMMARY
COMMERCIAL/INDUSTRIAL WORKER, OU2 EXPOSURE AREA 4
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard							
S7.1.4.CTE_0.8	Future	On-Site CI Worker	4	Surface Soil	Ingestion	3.00E-05	Aroclor 1260	2.3E-05	5.40E+00	Aroclor 1260	4.50E+00							
					Dermal	4.70E-06	Arsenic	6.0E-06										
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.40E-08	NA	NA	1.00E-01	NA	NA	NA	NA					
														Surface Soil Total	3.40E-05		6.40E+00	
														Subsurface Soil	Ingestion	1.60E-05	Aroclor 1260	1.1E-05
				Dermal	2.30E-06	Arsenic	4.9E-06	2.00E-06	3.90E-01	NA	NA							
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.00E-08	NA	NA	6.40E-02	NA	NA	NA	NA					
														Subsurface Soil Total	1.80E-05		3.20E+00	
				Groundwater	Ingestion	1.20E-07	NA	NA	2.40E+00	Cadmium	1.80E+00							
				Outdoor Air Vapors -- Groundwater	Inhalation	--	NA	NA	--	NA	NA							
				Indoor Air Vapors -- Groundwater	Inhalation	--	NA	NA	--	NA	NA							
					GW - MW27 Total	1.20E-07			2.40E+00									
					SS + GW	3.50E-05			8.70E+00									
					SB + GW	1.90E-05			5.50E+00									

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^e			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
95 UNION STREET	Resident	S7.9.6.175.RME	No	--	--	--	--	--	--	--	--	--	--
666 UNION STREET	Resident	S7.9.6.176.RME	No	--	--	--	--	--	9.7	9.4	--	--	Zn
234 UNION STREET - LASALLE WATER PLANT	Resident	S7.9.6.177.RME	No	--	--	--	--	--	0.65	--	--	--	--
880 WALNUT ROAD	Resident	S7.9.6.178.RME	No	--	--	--	--	--	1.6	1.5	--	--	Zn
2295 WASHINGTON STREET	Resident	S7.9.6.179.RME	No	--	--	--	--	--	0.66	--	--	--	--
WEST END OF HOUSING AUTHORITY - NEAR BAKER AVENUE AND WASHINGTON CT	Resident	S7.9.6.180.RME	No	--	--	--	--	--	0.79	--	--	--	--
447 WRIGHT STREET	Resident	S7.9.6.181.RME	Yes	6E-09	--	--	--	--	5.5	5.3	--	--	Cd, Zn
1429 ZINC STREET	Resident	S7.9.6.182.RME	No	--	--	--	--	--	5.6	5.5	--	--	Zn
1514 1/2 ZINC STREET	Resident	S7.9.6.183.RME	No	2E-04	1E-04	5E-05	6E-06	As	20	18	2.1	--	As, Cd, Zn
1628 ZINC STREET	Resident	S7.9.6.184.RME	No	--	--	--	--	--	4.5	4.4	--	--	Zn
1668 ZINC STREET	Resident	S7.9.6.185.RME	Yes	1E-04	7E-05	2E-05	3E-06	As	4.6	4.0	--	--	As, Cd, Zn

Notes:

Shaded cells identify total risks $\geq 1E-06$, total hazards > 1 , and lead exceedances (see footnote d).

- ^a The arsenic (As) relative bioavailability (RBA) of 0.8 is a site-specific assumption (see Section 2.3.2.1.1).
- ^b Receptors evaluated at Exposure Area (EA) 6 include residential (Res), utility workers (UW), and construction workers (CW).
- ^c RAGS D Table 7s are presented in Appendix RA-S1.
- ^d "Yes" indicates the following soil preliminary remediation goals (PRG) (see Appendix RA-4) have been exceeded: residential – 400 milligrams per kilogram (mg/kg); utility worker – 12,262 mg/kg; and construction worker – 941 mg/kg.
- ^e The exposure pathways and chemicals of concern (COC) are those that are associated with risks $\geq 1E-06$ or hazards > 1 . Exposure pathways are abbreviated as follows: ingestion of homegrown produce (P), incidental ingestion of soil (I), and dermal contact with soil (D).

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^f			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
433 ROOSEVELT ROAD	Resident	S7.9.6.155.RME	No	--	--	--	--	--	--	--	--	--	--
865 ROOSEVELT ROAD	Resident	S7.9.6.156.RME	No	--	--	--	--	--	1.5	1.4	--	--	Zn
406 SHOOTING PARK ROAD	Resident	S7.9.6.157.RME	No	--	--	--	--	--	--	--	--	--	--
2200 ST. VINCENTS AVENUE	Resident	S7.9.6.158.RME	No	4E-09	--	--	--	--	3.3	3.2	--	--	Cd, Zn
2256 ST. VINCENTS AVENUE	Resident	S7.9.6.159.RME	No	--	--	--	--	--	0.72	--	--	--	--
2701 ST. VINCENTS AVENUE	Resident	S7.9.6.160.RME	No	--	--	--	--	--	1.6	1.6	--	--	Zn
560 STERLING STREET	Resident	S7.9.6.161.RME	No	7E-09	--	--	--	--	9.7	8.6	1.1	--	Cd, Mn, Zn
1235 STERLING STREET	Resident	S7.9.6.162.RME	No	1E-04	7E-05	2E-05	3E-06	As	15	13	1.5	--	As, Cd, Zn
1251 STERLING STREET	Resident	S7.9.6.163.RME	Yes	2E-04	2E-04	7E-05	6E-06	As, Cr(VI)	33	29	3.0	--	Sb, As, Cd, Zn
1360 STERLING STREET	Resident	S7.9.6.164.RME	No	5E-09	--	--	--	--	4.7	4.5	--	--	Cd, Zn
545 TODD STREET	Resident	S7.9.6.165.RME	No	4E-09	--	--	--	--	3.6	3.5	--	--	Cd, Zn
601 TODD STREET	Resident	S7.9.6.166.RME	No	2E-04	1E-04	4E-05	5E-06	As	16	13	2.5	--	As, Cd, Mn, Zn
614 TODD STREET	Resident	S7.9.6.167.RME	No	--	--	--	--	--	3.1	3.0	--	--	Zn
1170 TONTI STREET	Resident	S7.9.6.168.RME	No	--	--	--	--	--	6.5	6.3	--	--	Zn
1272 TONTI STREET	Resident	S7.9.6.169.RME	No	--	--	--	--	--	1.9	1.8	--	--	Zn
1400 TONTI STREET	Resident	S7.9.6.170.RME	No	6E-09	--	--	--	--	5.7	5.4	--	--	Cd, Zn
1537 TONTI STREET	Resident	S7.9.6.171.RME	No	--	--	--	--	--	1.6	1.6	--	--	Zn
1550 TONTI STREET	Resident	S7.9.6.172.RME	No	1E-04	7E-05	3E-05	3E-06	As	6.7	5.7	--	--	Sb, As, Cd, Zn
1644 TONTI STREET	Resident	S7.9.6.173.RME	Yes	--	--	--	--	--	4.5	4.3	--	--	Zn
2222 TONTI STREET - HOUSING AUTHORITY	Resident	S7.9.6.174.RME	No	--	--	--	--	--	--	--	--	--	--

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHEIJSSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^f			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
902 MARQUETTE STREET	Resident	S7.9.6.134.RME	No	5E-09	--	--	--	--	4.0	3.8	--	--	Cd, Zn
MATTHEIJSSEN PARK - LAHARPE AND 9TH STREET	Resident	S7.9.6.135.RME	No	--	--	--	--	--	13	12	--	--	Zn
1522 NORTH JOLIET STREET	Resident	S7.9.6.136.RME	No	4E-04	3E-04	1E-04	1E-05	As	10	7.8	2.0	--	As, Cd, Zn
1126 NORTH MARQUETTE STREET	Resident	S7.9.6.137.RME	No	--	--	--	--	--	1.8	1.6	--	--	Sb
1172 NORTH MARQUETTE STREET	Resident	S7.9.6.138.RME	No	--	--	--	--	--	1.1	1.0	--	--	Zn
2260 NORTH TONTI STREET	Resident	S7.9.6.139.RME	No	--	--	--	--	--	2.0	2.0	--	--	Zn
NW end of Pulaski Park	Resident	S7.9.6.140.RME	No	--	--	--	--	--	1.3	1.3	--	--	Zn
400 OAK STREET	Resident	S7.9.6.141.RME	No	--	--	--	--	--	--	--	--	--	--
129 OCONOR AVENUE	Resident	S7.9.6.142.RME	No	--	--	--	--	--	--	--	--	--	--
609 OCONOR AVENUE	Resident	S7.9.6.143.RME	No	3E-09	--	--	--	--	5.7	4.5	1.1	--	Sb, Cd, Zn
848 OCONOR AVENUE	Resident	S7.9.6.144.RME	Yes	1E-04	9E-05	4E-05	3E-06	As, Cr(VI)	13	11	1.4	--	As, Cd, Mn, Zn
1266 OCONOR AVENUE	Resident	S7.9.6.145.RME	No	8E-09	--	--	--	--	8.9	8.3	--	--	Sb, Cd, Zn
1015 OCONOR AVENUE - VETERANS HOME	Resident	S7.9.6.146.RME	No	--	--	--	--	--	1.0	1.0	--	--	--
OCONOR AVENUE - WEST OF VETERANS HOME	Resident	S7.9.6.147.RME	No	3E-09	--	--	--	--	4.1	3.8	--	--	Sb, Cd, Zn
1510 PARK AVENUE	Resident	S7.9.6.148.RME	No	5E-09	--	--	--	--	4.0	3.9	--	--	Cd, Zn
3033 PARKSIDE DRIVE	Resident	S7.9.6.149.RME	No	--	--	--	--	--	--	--	--	--	--
440 PERU STREET	Resident	S7.9.6.150.RME	Yes	--	--	--	--	--	1.9	1.8	--	--	Zn
1214 PORTER AVENUE	Resident	S7.9.6.151.RME	No	--	--	--	--	--	2.2	2.1	--	--	Zn
1409 PORTER AVENUE	Resident	S7.9.6.152.RME	Yes	2E-04	1E-04	5E-05	5E-06	As	27	25	1.8	--	As, Cd, Zn
1714 PULASKI STREET	Resident	S7.9.6.153.RME	No	4E-09	--	--	--	--	5.1	4.7	--	--	Sb, Cd, Zn
2211 PULASKI STREET	Resident	S7.9.6.154.RME	No	--	--	--	--	--	--	--	--	--	--

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^e			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
226 LAHARPE STREET	Resident	S7.9.6.113.RME	Yes	1E-04	9E-05	4E-05	3E-06	As, Cr(VI)	6.2	5.5	--	--	As, Cd, Zn
628 LAHARPE STREET	Resident	S7.9.6.114.RME	Yes	1E-04	9E-05	3E-05	4E-06	As	21	18	2.4	--	As, Cd, Mn, Zn
636 LAHARPE STREET	Resident	S7.9.6.115.RME	Yes	2E-04	1E-04	5E-05	4E-06	As, Cr(VI)	22	19	2.9	--	As, Cd, Mn, Zn
837 LAHARPE STREET	Resident	S7.9.6.116.RME	Yes	2E-04	1E-04	5E-05	6E-06	As	38	34	3.5	--	As, Cd, Mn, Zn
1134 LAHARPE STREET	Resident	S7.9.6.117.RME	No	1E-04	8E-05	4E-05	3E-06	As, Cr(VI)	9.1	7.6	1.4	--	As, Cd, Mn, Zn
1234 LAHARPE STREET	Resident	S7.9.6.118.RME	No	1E-04	1E-04	4E-05	3E-06	As, Cr(VI)	11	10	1.0	--	As, Cd, Zn
1235 LAHARPE STREET	Resident	S7.9.6.119.RME	No	1E-08	--	--	--	--	12	11	1.0	--	Cd, Mn, Zn
1269 LAHARPE STREET	Resident	S7.9.6.120.RME	No	--	--	--	--	--	6.0	5.8	--	--	Zn
1302 LAHARPE STREET	Resident	S7.9.6.121.RME	Yes	2E-04	1E-04	4E-05	5E-06	As	35	32	2.8	--	Sb, As, Cd, Mn, Zn
1316 LAHARPE STREET	Resident	S7.9.6.122.RME	Yes	2E-04	1E-04	6E-05	5E-06	As, Cr(VI)	34	30	3.2	--	As, Cd, Mn, Zn
1343 LAHARPE STREET	Resident	S7.9.6.123.RME	No	1E-04	1E-04	5E-05	3E-06	As, Cr(VI)	11	9.7	1.1	--	As, Cd, Zn
1420 LAHARPE STREET	Resident	S7.9.6.124.RME	No	2E-04	1E-04	4E-05	4E-06	As	18	17	1.5	--	As, Cd, Zn
1533 LAHARPE STREET	Resident	S7.9.6.125.RME	No	8E-09	--	--	--	--	7.7	7.4	--	--	Cd, Zn
1660 LAHARPE STREET	Resident	S7.9.6.126.RME	No	--	--	--	--	--	1.7	1.7	--	--	Zn
1814 LAHARPE STREET	Resident	S7.9.6.127.RME	No	9E-09	--	--	--	--	8.9	8.5	--	--	Cd, Zn
1932 LAHARPE STREET	Resident	S7.9.6.128.RME	No	--	--	--	--	--	4.0	3.9	--	--	Zn
2110 LAHARPE STREET	Resident	S7.9.6.129.RME	No	--	--	--	--	--	2.7	2.6	--	--	Zn
17 LAUREN PLACE	Resident	S7.9.6.130.RME	No	--	--	--	--	--	--	--	--	--	--
18 LAUREN PLACE	Resident	S7.9.6.131.RME	No	--	--	--	--	--	--	--	--	--	--
1405 LINDEN AVENUE	Resident	S7.9.6.132.RME	No	4E-09	--	--	--	--	3.7	3.5	--	--	Cd, Zn
1728 MALCOLM AVENUE	Resident	S7.9.6.133.RME	No	1E-08	--	--	--	--	11	10	--	--	Cd, Mn, Zn

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^e			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
241 GRANT STREET	Resident	S7.9.6.94.RME	No	--	--	--	--	--	--	--	--	--	--
501 GRANT STREET	Resident	S7.9.6.95.RME	No	--	--	--	--	--	1.6	1.6	--	--	Zn
890 GRANT STREET	Resident	S7.9.6.96.RME	No	--	--	--	--	--	0.92	--	--	--	--
23 HEATHER DRIVE	Resident	S7.9.6.97.RME	No	--	--	--	--	--	1.6	1.3	--	--	Sb
HEGELER PARK	Resident	S7.9.6.98.RME	No	3E-09	--	--	--	--	4.6	4.2	--	--	Sb, Cd
HEGELER PARK - VETERANS MEMORIAL POOL	Resident	S7.9.6.99.RME	No	2E-09	--	--	--	--	1.9	1.8	--	--	Cd
238 HENNEPIN STREET	Resident	S7.9.6.100.RME	No	--	--	--	--	--	1.5	1.5	--	--	Zn
428 HENNEPIN STREET	Resident	S7.9.6.101.RME	Yes	2E-04	1E-04	5E-05	4E-06	As, Cr(VI)	15	12	2.2	--	As, Cd, Mn, Zn
1137 HENNEPIN STREET	Resident	S7.9.6.102.RME	No	--	--	--	--	--	6.2	6.0	--	--	Zn
1204 HENNEPIN STREET	Resident	S7.9.6.103.RME	Yes	1E-04	1E-04	3E-05	4E-06	As	11	9.8	1.0	--	As, Cd, Zn
1941 HENNEPIN STREET	Resident	S7.9.6.104.RME	No	--	--	--	--	--	0.85	--	--	--	--
2600 HENNEPIN STREET	Resident	S7.9.6.105.RME	No	--	--	--	--	--	1.6	1.3	--	--	Sb
I & M CANAL PARK, OFF OF JOLIET (351) STREET	Resident	S7.9.6.106.RME	No	--	--	--	--	--	3.4	2.6	--	--	Sb, Mn
1646 ILLINOIS STREET	Resident	S7.9.6.107.RME	No	3E-05	2E-05	1E-05	0E+00	Cr(VI)	2.9	2.8	--	--	Cd
926 JOLIET STREET	Resident	S7.9.6.108.RME	No	--	--	--	--	--	3.6	3.5	--	--	Zn
1515 JOLIET STREET	Resident	S7.9.6.109.RME	No	--	--	--	--	--	1.4	1.3	--	--	Zn
230 KILMAR ROAD	Resident	S7.9.6.110.RME	No	--	--	--	--	--	0.78	--	--	--	--
1233 LAFAYETTE STREET	Resident	S7.9.6.111.RME	No	6E-05	4E-05	3E-05	0E+00	Cr(VI)	10	8.6	1.5	--	Sb, Cd, Mn, Zn
1440 LAFAYETTE STREET	Resident	S7.9.6.112.RME	No	--	--	--	--	--	--	--	--	--	--

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^e			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
336 CROSAT STREET	Resident	S7.9.6.72.RME	No	--	--	--	--	--	1.2	1.1	--	--	Zn
427 CROSAT STREET	Resident	S7.9.6.73.RME	No	--	--	--	--	--	3.6	3.5	--	--	Zn
542 CROSAT STREET	Resident	S7.9.6.74.RME	Yes	1E-04	1E-04	3E-05	4E-06	As	21	18	2.5	--	As, Cd, Mn, Zn
661 CROSAT STREET	Resident	S7.9.6.75.RME	Yes	--	--	--	--	--	10	9.7	--	--	Zn
926 CROSAT STREET	Resident	S7.9.6.76.RME	Yes	--	--	--	--	--	10	10	--	--	Zn
1176 CROSAT STREET	Resident	S7.9.6.77.RME	No	2E-04	1E-04	5E-05	5E-06	As, Cr(VI)	19	16	2.3	--	As, Cd, Mn, Zn
1218 CROSAT STREET	Resident	S7.9.6.78.RME	No	1E-04	1E-04	3E-05	4E-06	As	18	16	2.0	--	As, Cd, Zn
1224 CROSAT STREET	Resident	S7.9.6.79.RME	Yes	2E-04	2E-04	6E-05	6E-06	As, Cr(VI)	22	20	2.4	--	Sb, As, Cd, Zn
1346 CROSAT STREET	Resident	S7.9.6.80.RME	No	1E-04	1E-04	4E-05	3E-06	As, Cr(VI)	13	12	1.1	--	As, Cd, Zn
1416 CROSAT STREET	Resident	S7.9.6.81.RME	Yes	--	--	--	--	--	7.6	7.4	--	--	Zn
1663 CROSAT STREET	Resident	S7.9.6.82.RME	No	--	--	--	--	--	3.1	3.0	--	--	Zn
1924 CROSAT STREET	Resident	S7.9.6.83.RME	No	--	--	--	--	--	5.7	5.5	--	--	Zn
2053 CROSAT STREET	Resident	S7.9.6.84.RME	No	3E-09	--	--	--	--	4.2	3.8	--	--	Sb, Cd
2220 CROSAT STREET	Resident	S7.9.6.85.RME	No	--	--	--	--	--	1.2	1.2	--	--	Zn
2320 DONAHUE STREET	Resident	S7.9.6.86.RME	No	--	--	--	--	--	1.6	1.4	--	--	Sb
208 EDWARDS AVENUE	Resident	S7.9.6.87.RME	No	--	--	--	--	--	0.68	--	--	--	--
308 EDWARDS AVENUE	Resident	S7.9.6.88.RME	No	3E-09	--	--	--	--	5.5	5.1	--	--	Sb, Cd, Zn
702 EDWARDS AVENUE	Resident	S7.9.6.89.RME	No	--	--	--	--	--	1.0	--	--	--	--
431 GARFIELD AVENUE	Resident	S7.9.6.90.RME	No	3E-09	--	--	--	--	3.5	3.4	--	--	Cd, Zn
653 GARFIELD AVENUE	Resident	S7.9.6.91.RME	No	--	--	--	--	--	--	--	--	--	--
650 GOODING STREET	Resident	S7.9.6.92.RME	No	9E-08	--	--	--	--	21	17	4.1	--	Cd, Co, Mn, Zn
GRANT AVENUE - ST. MARYS PARK	Resident	S7.9.6.93.RME	No	--	--	--	--	--	1.0	1.0	--	--	--

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^f			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
953 7TH STREET	Resident	S7.9.6.47.RME	Yes	--	--	--	--	--	9.7	9.4	--	--	Zn
1156 7TH STREET	Resident	S7.9.6.48.RME	Yes	--	--	--	--	--	9.7	9.4	--	--	Zn
1440 7TH STREET	Resident	S7.9.6.49.RME	Yes	2E-04	1E-04	5E-05	4E-06	As, Cr(VI)	25	21	3.9	--	As, Cd, Mn, Zn
1454 7TH STREET	Resident	S7.9.6.50.RME	No	2E-04	1E-04	4E-05	5E-06	As	25	21	3.4	--	As, Cd, Mn, Zn
412 8TH STREET	Resident	S7.9.6.51.RME	No	--	--	--	--	--	2.8	2.7	--	--	Zn
855 8TH STREET	Resident	S7.9.6.52.RME	No	--	--	--	--	--	3.7	3.6	--	--	Zn
955 8TH STREET	Resident	S7.9.6.53.RME	No	1E-08	--	--	--	--	11	9.7	--	--	Cd, Mn, Zn
1016 8TH STREET	Resident	S7.9.6.54.RME	No	--	--	--	--	--	6.2	6.0	--	--	Zn
1239 8TH STREET	Resident	S7.9.6.55.RME	Yes	--	--	--	--	--	6.4	6.2	--	--	Zn
505 9TH STREET	Resident	S7.9.6.56.RME	No	7E-09	--	--	--	--	6.9	6.6	--	--	Cd, Zn
945 9TH STREET	Resident	S7.9.6.57.RME	No	--	--	--	--	--	1.9	1.8	--	--	Zn
1419 ARGYLE ROAD	Resident	S7.9.6.58.RME	No	6E-04	4E-04	1E-04	2E-05	As	10	7.3	2.8	--	As, Cd, Zn
905 BAKER AVENUE	Resident	S7.9.6.59.RME	No	--	--	--	--	--	0.69	--	--	--	--
BAKER LAKE RECREATION AREA	Resident	S7.9.6.60.RME	No	--	--	--	--	--	--	--	--	--	--
2222 BARTLEY STREET	Resident	S7.9.6.61.RME	No	--	--	--	--	--	--	--	--	--	--
36 BUCK STREET	Resident	S7.9.6.62.RME	No	7E-09	--	--	--	--	9.1	8.7	--	--	Cd, Zn
137 BUCKLIN STREET	Resident	S7.9.6.63.RME	No	4E-09	--	--	--	--	3.8	3.7	--	--	Cd, Zn
227 BUCKLIN STREET	Resident	S7.9.6.64.RME	Yes	--	--	--	--	--	2.1	2.0	--	--	Zn
1118 BUCKLIN STREET	Resident	S7.9.6.65.RME	No	2E-09	--	--	--	--	2.1	2.0	--	--	Cd
1023 CANAL STREET	Resident	S7.9.6.66.RME	Yes	--	--	--	--	--	1.8	1.7	--	--	Zn
442 CENTRAL STREET	Resident	S7.9.6.67.RME	Yes	1E-04	1E-04	4E-05	3E-06	As, Cr(VI)	13	11	1.6	--	As, Cd, Zn
519 CENTRAL STREET	Resident	S7.9.6.68.RME	No	1E-04	9E-05	4E-05	3E-06	As, Cr(VI)	8.3	6.9	1.3	--	As, Cd, Zn
2041 CHARLES STREET	Resident	S7.9.6.69.RME	No	--	--	--	--	--	--	--	--	--	--
1022 CREVECOEUR STREET	Resident	S7.9.6.70.RME	No	4E-09	--	--	--	--	5.8	5.0	--	--	Cd, Mn, Zn
1621 CREVECOEUR STREET	Resident	S7.9.6.71.RME	No	--	--	--	--	--	--	--	--	--	--

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^e			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
1201 3RD STREET	Resident	S7.9.6.22.RME	No	--	--	--	--	--	3.6	3.5	--	--	Zn
1303 3RD STREET	Resident	S7.9.6.23.RME	No	--	--	--	--	--	4.3	4.1	--	--	Zn
848 4TH STREET	Resident	S7.9.6.24.RME	Yes	--	--	--	--	--	2.4	2.3	--	--	Zn
1137 4TH STREET	Resident	S7.9.6.25.RME	No	--	--	--	--	--	1.8	1.7	--	--	Zn
1303 4TH STREET	Resident	S7.9.6.26.RME	Yes	--	--	--	--	--	4.1	4.0	--	--	Zn
1413 4TH STREET	Resident	S7.9.6.27.RME	Yes	1E-04	9E-05	4E-05	3E-06	As, Cr(VI)	13	10	2.3	--	As, Cd, Mn, Zn
1437 4TH STREET	Resident	S7.9.6.28.RME	No	2E-04	1E-04	4E-05	4E-06	As, Cr(VI)	13	11	2.2	--	As, Cd, Mn, Zn
1547 4TH STREET	Resident	S7.9.6.29.RME	No	4E-09	--	--	--	--	3.9	3.8	--	--	Cd, Zn
1559 4TH STREET	Resident	S7.9.6.30.RME	No	1E-04	9E-05	3E-05	4E-06	As	12	9.8	2.1	--	As, Cd, Mn, Zn
218 5TH STREET	Resident	S7.9.6.31.RME	Yes	--	--	--	--	--	1.7	1.7	--	--	Zn
227 5TH STREET	Resident	S7.9.6.32.RME	No	8E-09	--	--	--	--	9.1	8.1	--	--	Cd, Mn, Zn
740 5TH STREET	Resident	S7.9.6.33.RME	Yes	--	--	--	--	--	2.2	2.1	--	--	Zn
1349 5TH STREET	Resident	S7.9.6.34.RME	No	--	--	--	--	--	3.4	3.3	--	--	Zn
1430 5TH STREET	Resident	S7.9.6.35.RME	No	2E-09	--	--	--	--	2.5	2.4	--	--	Cd, Zn
1436 5TH STREET	Resident	S7.9.6.36.RME	Yes	2E-04	1E-04	5E-05	4E-06	As, Cr(VI)	12	10	1.9	--	As, Cd, Zn
1554 5TH STREET	Resident	S7.9.6.37.RME	No	1E-04	9E-05	4E-05	3E-06	As, Cr(VI)	11	9.7	1.3	--	As, Cd, Zn
1555 5TH STREET	Resident	S7.9.6.38.RME	No	2E-04	1E-04	5E-05	4E-06	As, Cr(VI)	12	9.5	2.4	--	As, Cd, Mn, Zn
851 6TH STREET	Resident	S7.9.6.39.RME	Yes	2E-04	1E-04	6E-05	4E-06	As, Cr(VI)	17	16	1.2	--	As, Cd, Zn
1216 6TH STREET	Resident	S7.9.6.40.RME	Yes	--	--	--	--	--	6.2	6.0	--	--	Zn
1317 6TH STREET	Resident	S7.9.6.41.RME	Yes	--	--	--	--	--	6.2	6.0	--	--	Zn
1338 6TH STREET	Resident	S7.9.6.42.RME	No	1E-04	1E-04	4E-05	3E-06	As, Cr(VI)	28	25	2.9	--	As, Cd, Mn, Zn
127 7TH STREET	Resident	S7.9.6.43.RME	Yes	1E-04	8E-05	3E-05	3E-06	As	13	11	2.0	--	As, Cd, Mn, Zn
215 7TH STREET	Resident	S7.9.6.44.RME	Yes	--	--	--	--	--	2.5	2.4	--	--	Zn
427 7TH STREET	Resident	S7.9.6.45.RME	No	4E-04	3E-04	1E-04	1E-05	As, Cr(VI)	9.2	7.2	1.8	--	As, Cd, Zn
817 7TH STREET	Resident	S7.9.6.46.RME	Yes	--	--	--	--	--	7.0	6.8	--	--	Zn

TABLE RA-S2-55A

RISK AND HAZARD SUMMARY
EXPOSURE AREA 6 (As RBA = 0.8)^a
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Address	Receptor ^b	RAGS D Table 7 ^c	Lead Risk ^d	Total Risk	Risk Drivers ^e				Total Hazard	Hazard Drivers ^e			
					Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs		Ingestion of Homegrown Produce	Ingestion of Soil	Dermal Contact with Soil	COCs
304 10TH STREET	Resident	S7.9.6.1.RME	No	--	--	--	--	--	3.3	3.2	--	--	Zn
526 10TH STREET	Resident	S7.9.6.2.RME	No	--	--	--	--	--	3.8	3.6	--	--	Zn
1025 10TH STREET	Resident	S7.9.6.3.RME	Yes	--	--	--	--	--	6.8	6.6	--	--	Zn
1134 10TH STREET	Resident	S7.9.6.4.RME	Yes	2E-04	1E-04	5E-05	6E-06	As	57	52	4.4	--	Sb, As, Cd, Mn, Zn
1144 10TH STREET	Resident	S7.9.6.5.RME	Yes	1E-04	1E-04	3E-05	4E-06	As	29	27	2.3	--	As, Cd, Mn, Zn
121 11TH STREET	Resident	S7.9.6.6.RME	No	4E-09	--	--	--	--	3.3	3.2	--	--	Cd, Zn
773 11TH STREET	Resident	S7.9.6.7.RME	No	--	--	--	--	--	2.3	2.2	--	--	Zn
1153 11TH STREET	Resident	S7.9.6.8.RME	Yes	2E-04	1E-04	4E-05	5E-06	As	53	49	3.4	--	Sb, As, Cd, Mn, Zn
1231 11TH STREET	Resident	S7.9.6.9.RME	Yes	2E-04	2E-04	6E-05	7E-06	As	64	58	5.7	--	Sb, As, Cd, Co, Mn, Zn
1249 11TH STREET	Resident	S7.9.6.10.RME	No	2E-04	1E-04	5E-05	5E-06	As	31	29	2.5	--	As, Cd, Mn, Zn
1251 11TH STREET	Resident	S7.9.6.11.RME	No	4E-09	--	--	--	--	3.7	3.4	--	--	Cd, Zn
1157 1ST STREET	Resident	S7.9.6.12.RME	No	--	--	--	--	--	1.8	1.8	--	--	Zn
605 23RD STREET	Resident	S7.9.6.13.RME	No	--	--	--	--	--	--	--	--	--	--
860 24TH STREET	Resident	S7.9.6.14.RME	No	--	--	--	--	--	0.64	--	--	--	--
852 25TH STREET	Resident	S7.9.6.15.RME	No	--	--	--	--	--	0.58	--	--	--	--
952 25TH STREET	Resident	S7.9.6.16.RME	No	--	--	--	--	--	0.79	--	--	--	--
1003 2ND STREET	Resident	S7.9.6.17.RME	No	--	--	--	--	--	1.6	1.5	--	--	Zn
1115 2ND STREET	Resident	S7.9.6.18.RME	No	--	--	--	--	--	1.5	1.5	--	--	Zn
1239 2ND STREET	Resident	S7.9.6.19.RME	Yes	--	--	--	--	--	3.0	2.9	--	--	Zn
709 3RD STREET	Resident	S7.9.6.20.RME	Yes	1E-04	8E-05	3E-05	3E-06	As	11	8.9	1.6	--	As, Cd, Mn, Zn
931 3RD STREET	Resident	S7.9.6.21.RME	Yes	2E-04	1E-04	5E-05	4E-06	As, Cr(VI)	15	13	2.6	--	As, Cd, Mn, Zn

TABLE RA-S2-55

**RISK AND HAZARD SUMMARY
 OU2 OFF-SITE RESIDENTIAL AREA (EA6)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Current/Future Utility Worker	RME	1E-05	Soil (Ing): As Lead: No risk Asbestos: No risk	NS	--
	CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
	RME	1E-06	Soil (Ing): As Lead: Risk Asbestos: No risk	2.8	Soil: All < 1
	CTE	NS	-- Lead: Risk Asbestos: No risk	NS	--
Future Resident	RME	2E-04	Soil (Ing/D): As, Cr+6 Prod (Ing): As, Cr+6 Lead: Risk at some locations Asbestos: No risk	18	Prod (Ing): Cd, Zn, Mn
	CTE	4E-05	Soil (Ing): As, Cr+6 Prod (Ing): As, Cr+6 Lead: Risk at some locations Asbestos: No risk	8.5	Prod (Ing): Cd, Zn

Notes:

- | | | | |
|------|---------------------------|-----|---|
| -- | Not identified | | |
| As | Arsenic | Ing | Ingestion |
| Cd | Cadmium | Mn | Manganese |
| Cr+6 | Hexavalent chromium | NS | Not significant (risks<10 ⁻⁶ and HI<1) |
| CTE | Central tendency exposure | RME | Reasonable maximum exposure |
| D | Dermal | Zn | Zinc |

All soil results for utility and construction workers are based on maximum detected concentrations.

Results in this table for the future resident represent risks and hazards for the entire EA6 exposure area. Property-specific risks and hazards are presented in Table RA-S2-55A.

TABLE RA-S2-54

**RISK AND HAZARD SUMMARY
OU2 ROLLING MILL AREA (EA5)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers		
Future Adolescent Recreationalist	Non-Intrusive - RME	6E-06	Soil (Ing/D): BaP Lead: No risk Asbestos: No risk	NS	--		
	Non-Intrusive - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--		
	Intrusive - RME	3E-06	Soil (D): BaP Lead: No risk Asbestos: No risk	NS	--		
			Intrusive - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
			Non-Intrusive - RME	7E-06	Soil (Ing/D): BaP, A1248 Lead: No risk Asbestos: No risk	NS	--
	Future Adult Recreationalist	Non-Intrusive - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--	
Intrusive - RME		4E-06	Soil (D): BaP Lead: No risk Asbestos: No risk	NS	--		
			Intrusive - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--

Notes:

--	Not identified	Ing	Ingestion
A1248	Aroclor 1248	Inh	Inhalation
A1254	Aroclor 1254	NS	Not significant (risks<10-6 and HI<1)
As	Arsenic	PAHs	Polycyclic aromatic hydrocarbons
BaP	Benzo(a)pyrene	RME	Reasonable maximum exposure
CN	Cyanide	TCE	Trichloroethene
CTE	Central tendency exposure	VC	Vinyl chloride
Cu	Copper	Zn	Zinc
D	Dermal		

All soil results for utility and construction workers are based on maximum detected concentrations.

TABLE RA-S2-54

RISK AND HAZARD SUMMARY
 OU2 ROLLING MILL AREA (EA5)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers	
Current/Future Adolescent Trespasser	Current - RME	6E-06	Soil (Ing/D): BaP Lead: No risk Asbestos: No risk	NS	--	
	Current - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--	
	Future - RME	3E-06	Soil (D): BaP Lead: No risk Asbestos: No risk	NS	--	
	Future - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--	
	Current/Future Adult Trespasser	Current - RME	7E-06	Soil (Ing/D): BaP, Aroclor 1248 Lead: No risk Asbestos: No risk	NS	--
		Current - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
Future - RME		4E-06	Soil (D): BaP Lead: No risk Asbestos: No risk	NS	--	
Future - CTE		NS	-- Lead: No risk Asbestos: No risk	NS	--	
Future Child Recreationalist		Non-Intrusive - RME	4E-05	Soil (Ing/D): PAHs, A1248 Lead: Risk Asbestos: No risk	1.3	All < 1
		Non-Intrusive - CTE	6E-06	Soil (Ing/D): BaP Lead: No risk Asbestos: No risk	NS	--
	Intrusive - RME	2E-05	Soil (Ing/D): PAHs Lead: Risk Asbestos: No risk	NS	--	
	Intrusive - CTE	3E-06	Soil: All < 1E-06 Lead: Risk Asbestos: No risk	NS	--	

TABLE RA-S2-54

**RISK AND HAZARD SUMMARY
OU2 ROLLING MILL AREA (EA5)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Commercial/Industrial Worker	Non-Intrusive - RME	1E-04	Soil (Ing/D): As, A1248, PAHs GW (Ing): VC, A1254, TCE	9.4	Inh Particulates: CN
			Lead: Risk Asbestos: No risk		
	Non-Intrusive - CTE	1E-05	Soil (Ing): BaP, As, A1248 GW (Ing): VC	11	Inh Particulates: CN
			Lead: Risk Asbestos: No risk		
	Intrusive - RME	6E-05	Soil (Ing/D): As, A1248, PAHs GW (Ing): VC, A1254, TCE	5.2	Inh Particulates: CN
			Lead: Risk Asbestos: No risk		
Future Utility Worker	Intrusive - CTE	1E-05	Soil (Ing): BaP, As GW (Ing): VC	6.8	Inh Particulates: CN
			Lead: Risk Asbestos: No risk		
	RME	9E-05	Soil (Ing/D): PAHs, As, A1248	2.7	Inh Particulates: CN
			Lead: No risk Asbestos: No risk		
	CTE	5E-06	Soil (Ing/D): BaP	1.7	Inh Particulates: CN
			Lead: No risk Asbestos: No risk		
Future Construction Worker	RME	1E-05	Soil (Ing/D): BaP, As	260	Inh Particulates: CN Soil (Ing): A1248, Zn, Cu
			Lead: Risk Asbestos: No risk		
	CTE	2E-06	Soil: All < 1E-06	250	Inh Particulates: CN
			Lead: Risk Asbestos: No risk		

TABLE RA-S2-53

**RISK AND HAZARD SUMMARY
OU2 BUILDING 100 HOT SPOT (EA4)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Adolescent Recreationalist	Non-Intrusive - RME	8E-06	Soil (Ing/D): A1260 Lead: Risk Asbestos: No risk	1.3	All < 1
	Non-Intrusive - CTE	NS	None Lead: No risk Asbestos: No risk	NS	--
	Intrusive - RME	4E-06	Soil (D): A1260 Lead: No risk Asbestos: No risk	NS	--
			Intrusive - CTE		
Future Adult Recreationalist	Non-Intrusive - RME	2E-05	Soil (Ing/D): A1260, As Lead: No risk Asbestos: No risk	1.3	All < 1
	Non-Intrusive - CTE	NS	None Lead: No risk Asbestos: No risk	NS	--
	Intrusive - RME	1E-05	Soil (Ing/D): A1260 Lead: No risk Asbestos: No risk	NS	--
			Intrusive - CTE		

Notes:

--	Not identified	D	Dermal
A1260	Aroclor 1260	Ing	Ingestion
As	Arsenic	Inh	Inhalation
BaP	Benzo(a)pyrene	Mn	Manganese
Cd	Cadmium	NS	Not significant (risks<10 ⁻⁶ and HI<1)
CTE	Central tendency exposure	RME	Reasonable maximum exposure

All soil results for utility and construction workers are based on maximum detected concentrations.

TABLE RA-S2-53

**RISK AND HAZARD SUMMARY
OU2 BUILDING 100 HOT SPOT (EA4)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Current/Future Adolescent Trespasser	Current - RME	8E-06	Soil (Ing/D): A1260 Lead: No risk Asbestos: No risk	1.3	All <1
	Current - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
	Future - RME	4E-06	Soil (D): A1260 Lead: No risk Asbestos: No risk	NS	--
	Future - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
	Current - RME	2E-05	Soil (Ing/D): A1260, As Lead: No risk Asbestos: No risk	1.3	All < 1
	Current - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
Current/Future Adult Trespasser	Future - RME	1E-05	Soil (Ing/D): A1260 Lead: No risk Asbestos: No risk	NS	--
	Future - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
	Non-Intrusive - RME	3E-05	Soil (Ing/D): A1260, As, BaP Lead: Risk Asbestos: No risk	9	Soil (Ing/D): A1260
	Non-Intrusive - CTE	5E-06	Soil (Ing/D): A1260 Lead: Risk Asbestos: No risk	1.2	All < 1
	Intrusive - RME	2E-05	Soil (Ing/D): A1260, As Lead: Risk Asbestos: No risk	4.3	Soil (D): A1260
	Intrusive - CTE	3E-06	Soil (D): A1260 Lead: Risk Asbestos: No risk	NS	--

TABLE RA-S2-53

**RISK AND HAZARD SUMMARY
OU2 BUILDING 100 HOT SPOT (EA4)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Commercial/Industrial Worker	Non-Intrusive - RME	3E-04	Soil (Ing/D): A1260, As, BaP Lead: Risk Asbestos: Risk	25	Soil (Ing/D): A1260, Mn GW (Ing): Cd
	Non-Intrusive - CTE	4E-05	Soil (Ing/D): As, A1260 Lead: Risk Asbestos: Risk	8.7	Soil (Ing): A1260 GW (Ing): Cd
	Intrusive - RME	2E-04	Soil (Ing/D): A1260, As Lead: Risk Asbestos: No risk	13	Soil (Ing): A1260 GW (Ing): Cd
	Intrusive - CTE	2E-05	Soil (Ing/D): A1260, As Lead: Risk Asbestos: No risk	5.5	Soil (Ing): A1260 GW (Ing): Cd
	RME	7E-05	Soil (Ing/D): A1260, As Lead: No risk Asbestos: No risk	4.8	Soil (Ing/D): A1260
	CTE	4E-06	Soil (Ing): A1260 Lead: No risk Asbestos: No risk	NS	--
	RME	1E-05	Soil (Ing/D): A1260, As Lead: Risk Asbestos: No risk	62	Soil (Ing/D): A1260, Mn, As
Future Construction Worker	CTE	1E-06	Soil: All < 1E-06 Lead: Risk Asbestos: No risk	19	Soil (Ing/D): A1260, Mn

TABLE RA-S2-52

**RISK AND HAZARD SUMMARY
 OU2 WOODED AREA -- NORTHEAST (EA3)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Adult Recreationalist	Non-Intrusive - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Non-Intrusive - CTE	NS	None	NS	--
			Lead: No risk Asbestos: No risk		
	Intrusive - RME	NS	None	NS	--
			Lead: No risk Asbestos: No risk		
	Intrusive - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		

Notes:

- | | |
|-----|---|
| -- | Not identified |
| As | Arsenic |
| CTE | Central tendency exposure |
| D | Dermal |
| Ing | Ingestion |
| Inh | Inhalation |
| NS | Not significant (risks<10 ⁻⁶ and HI<1) |
| RME | Reasonable maximum exposure |

All soil results for utility and construction workers are based on maximum detected concentrations.

TABLE RA-S2-52

**RISK AND HAZARD SUMMARY
OU2 WOODED AREA -- NORTHEAST (EA3)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Current/Future Adult Trespasser	Current - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Current - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Future - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Future - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
Future Child Recreationalist	Non-Intrusive - RME	2E-06	None	NS	--
			Lead: No risk Asbestos: No risk		
	Non-Intrusive - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Intrusive - RME	2E-06	--	NS	--
			Lead: No risk Asbestos: No risk		
	Intrusive - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
Future Adolescent Recreationalist	Non-Intrusive - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Non-Intrusive - CTE	NS	None	NS	--
			Lead: No risk Asbestos: No risk		
	Intrusive - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Intrusive - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		

TABLE RA-S2-52

**RISK AND HAZARD SUMMARY
 OU2 WOODED AREA -- NORTHEAST (EA3)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Utility Worker	RME	2E-05	Soil (Ing/D): As Lead: No risk Asbestos: No risk	NS	--
	CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
Future Construction Worker	RME	2E-06	Soil (Ing): As Lead: Risk Asbestos: No risk	4.8	Soil (Ing): As
	CTE	NS	-- Lead: Risk Asbestos: No risk	1.6	Soil: All < 1
Current/Future Adolescent Trespasser	Current - RME	NS	-- Lead: No risk Asbestos: No risk	NS	--
	Current - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
	Future - RME	NS	-- Lead: No risk Asbestos: No risk	NS	--
	Future - CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--

TABLE RA-S2-51

RISK AND HAZARD SUMMARY
 OU2 WOODED AREA – NORTH (EA2)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Resident	Non-Intrusive - RME	6E-04 to 7E-04	Soil (Ing/D): As, PAHs, Cr+6 Prod (Ing): As, PAHs, Cr+6 GW(Ing): As, Cr+6 (MW15); As, delta-BHC, Cr+6 (MW22) GW (D): PCP, As, Cr+6 (MW15); IndP, delta-BHC, HE, Cr+6 (MW22)	88 to 89	Soil (Ing): Cd Prod: Cd, Zn, Cu, Sb GW (Ing): As, Co (MW15) Fe, Al (MW22)
			Lead: Risk Asbestos: No risk		
	Non-Intrusive - CTE	2E-04 to 3E-04	Soil (Ing): As, PAHs, Cr+6 Prod (Ing): As, PAHs, Cr+6 GW (Ing): As, Cr+6 GW (D): PCP (MW15) and IndP, Cr+6 (MW22)	48 to 49	Soil (Ing): All < 1 Prod: Cd, Zn, Cu, Sb GW (Ing): As, Co (MW15) Fe, Al (MW22)
			Lead: Risk Asbestos: No risk		
	Intrusive - RME	5E-04 to 7E-04	Soil (Ing/D): As, PAHs, Cr+6 Prod (Ing): As, PAHs, Cr+6 GW(Ing): As, Cr+6 (MW15); As, delta-BHC, Cr+6 (MW22) GW (D): PCP, Cr+6 (MW15); IndP, delta-BHC, HE, Cr+6 (MW22)	77	Soil (Ing): Cd Prod: Cd, Zn, Cu, Sb GW (Ing): As, Co (MW15) Fe, Al (MW22)
			Lead: No risk Asbestos: No risk		
	Intrusive - CTE	2E-04 to 3E-04	Similar to RME	42 to 43	Similar to RME
			Lead: No risk Asbestos: No risk		

Notes:

-	Not identified	IndP	Indeno(1,2,3-cd)pyrene
A1248	Aroclor 1248	Ing	Ingestion
As	Arsenic	Inh	Inhalation
BaP	Benzo(a)pyrene	NS	Not significant (risks < 10 ⁻⁶ and HI < 1)
Cd	Cadmium	PAH	Polycyclic aromatic hydrocarbons
Co	Cobalt	PCP	Pentachlorophenol
Cr+6	Hexavalent chromium	RME	Reasonable maximum exposure
CTE	Central tendency exposure	TCE	Trichloroethene
Cu	Copper	VC	Vinyl chloride
D	Dermal	Zn	Zinc
delta-BHC	1,2,3,4,5,6-hexachloro-cyclohexane		
HE	Heptachlor epoxide		

All soil results for utility and construction workers are based on maximum detected concentrations.

TABLE RA-S2-51

RISK AND HAZARD SUMMARY
 OU2 WOODED AREA -- NORTH (EA2)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Child Recreationalist	Non-Intrusive - RME	NS	–	NS	–
			Lead: No risk Asbestos: No risk		
	Non-Intrusive - CTE	NS	–	NS	–
			Lead: No risk Asbestos: No risk		
	Intrusive - RME	NS	–	NS	–
			Lead: No risk Asbestos: No risk		
Intrusive - CTE	NS	–	NS	–	
		Lead: No risk Asbestos: No risk			
Future Adolescent Recreationalist	Non-Intrusive - RME	NS	–	NS	–
			Lead: No risk Asbestos: No risk		
	Non-Intrusive - CTE	NS	None	NS	–
			Lead: No risk Asbestos: No risk		
	Intrusive - RME	NS	–	NS	–
			Lead: No risk Asbestos: No risk		
Intrusive - CTE	NS	–	NS	–	
		Lead: No risk Asbestos: No risk			
Future Adult Recreationalist	Non-Intrusive - RME	NS	–	NS	–
			Lead: No risk Asbestos: No risk		
	Non-Intrusive - CTE	NS	None	NS	–
			Lead: No risk Asbestos: No risk		
	Intrusive - RME	NS	None	NS	–
			Lead: No risk Asbestos: No risk		
Intrusive - CTE	NS	–	NS	–	
		Lead: No risk Asbestos: No risk			

TABLE RA-S2-51

RISK AND HAZARD SUMMARY
 OU2 WOODED AREA -- NORTH (EA2)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Current/Future Adolescent Trespasser	Current - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Current - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Future - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Future - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
Current/Future Adult Trespasser	Current - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Current - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Future - RME	NS	--	NS	--
			Lead: No risk Asbestos: No risk		
	Future - CTE	NS	--	NS	--
			Lead: No risk Asbestos: No risk		

TABLE RA-S2-51

RISK AND HAZARD SUMMARY
 OU2 WOODED AREA -- NORTH (EA2)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Commercial/Industrial Worker	Non-Intrusive - RME	4E-05 to 1E-04	Soil (Ing/D): As GW (Ing): As, Cr+6 Lead: No risk Asbestos: No risk	1.5 to 1.6	GW: Cr+6 (MW 15/MW22)
	Non-Intrusive - CTE	1E-05 to 4E-05	Soil (Ing): All < 1E-06 GW (Ing): As, Cr+6 (MW22) Lead: No risk Asbestos: No risk	1.1 to 1.2	GW: All <1
	Intrusive - RME	4E-05 to 1E-04	Soil (Ing/D): As GW (Ing): As, Cr+6 Lead: No risk Asbestos: No risk	1.5 to 1.6	GW: Cr+6 (MW 15/MW22)
	Intrusive - CTE	1E-05 to 4E-05	Soil (Ing): All < 1E-06 GW (Ing): As, Cr+6 (MW22) Lead: No risk Asbestos: No risk	1.1 to 1.2	GW: All <1
	RME	1E-05	Soil (Ing/D): As Lead: No risk Asbestos: No risk	NS	--
	CTE	NS	-- Lead: No risk Asbestos: No risk	NS	--
Future Construction Worker	RME	2E-06	Soil (Ing): As Lead: Risk Asbestos: No risk	4.8 to 4.9	Soil (Ing): Zn
	CTE	NS	-- Lead: Risk Asbestos: No risk	1.5	Soil: All < 1

TABLE RA-S2-50

RISK AND HAZARD SUMMARY
 OU2 MAIN PLANT AREA (EA1)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Adolescent Recreationalist	Non-Intrusive - RME	3E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Non-Intrusive - CTE	NS	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Intrusive - RME	3E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Intrusive - CTE	1E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
Future Adult Recreationalist	Non-Intrusive - RME	5E-06	Soil (D): As	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Non-Intrusive - CTE	NS	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Intrusive - RME	4E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Intrusive - CTE	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		

Notes:

--	Not identified	Hg	Mercury
A1248	Aroclor 1248	Ing	Ingestion
A1260	Aroclor 1260	Inh	Inhalation
As	Arsenic	Mn	Manganese
BaP	Benzo(a)pyrene	NS	Not significant (risks<10 ⁻⁶ and HI<1)
Cd	Cadmium	RME	Reasonable maximum exposure
Co	Cobalt	TCE	Trichloroethene
CTE	Central tendency exposure	VC	Vinyl chloride
D	Dermal	Zn	Zinc

All soil results for utility and construction workers are based on maximum detected concentrations.

TABLE RA-S2-50

RISK AND HAZARD SUMMARY
 OU2 MAIN PLANT AREA (EA1)
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Current/ Future Adolescent Trespasser	Current - RME	3E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Current - CTE	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Future - RME	3E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Future - CTE	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		
Current/Future Adult Trespasser	Current - RME	5E-06	Soil (D): As	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Current - CTE	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Future - RME	4E-06	None	NS	--
			Lead: No risk		
			Asbestos: No risk		
	Future - CTE	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		
Future Child Recreationalist	Non-Intrusive - RME	2E-05	Soil (Ing/D): As, BaP	NS	--
			Lead: Risk		
			Asbestos: No risk		
	Non-Intrusive - CTE	3E-06	None	NS	--
			Lead: Risk		
			Asbestos: No risk		
	Intrusive - RME	1E-05	Soil (Ing/D): As, BaP	NS	--
			Lead: Risk		
			Asbestos: No risk		
	Intrusive - CTE	2E-06	--	NS	--
			Lead: Risk		
			Asbestos: No risk		

TABLE RA-S2-50

**RISK AND HAZARD SUMMARY
OU2 MAIN PLANT AREA (EA1)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Future Commercial/Industrial Worker	Non-Intrusive - RME	7E-05 to 1E-04	Soil (Ing/D): As, BaP, A1248 GW (Ing/Inh): VC, TCE (MW04) Lead: Risk Asbestos: Potential risk	17 (MW31) 240 (MW04)	MW31: Cd, Zn MW04: Co, Mn
	Non-Intrusive - CTE	8E-06 to 2E-05	Soil (Ing): As, BaP GW (Inh): VC, TCE (MW04) Lead: Risk Asbestos: Potential risk	15 (MW31) 210 (MW04)	MW31 (Ing): Cd, Zn MW04 (Ing): Co, Mn
	Intrusive - RME	5E-05 to 1E-04	Soil (Ing/D): As, BaP, A1248 GW (Inh): VC, TCE (MW04) Lead: Risk Asbestos: No risk	17 (MW31) 240 (MW04)	MW31: Cd, Zn MW04: Co, Mn
	Intrusive - CTE	6E-06 to 2E-05	Soil (Ing): As GW (Inh): VC, TCE (MW04) Lead: Risk Asbestos: No risk	14 (MW31) 210 (MW04)	MW31 (Ing): Cd, Zn MW04 (Ing): Co, Mn
	RME	2E-04	Soil (Ing/D): As, A1260, and PAHs Lead: Risk Asbestos: No risk	5.9	Soil (Ing): Cd
	CTE	1E-05	Soil (Ing/D): As, BaP Lead: Risk Asbestos: No risk	1.1	--
Future Construction Worker	RME	2E-05	Soil (Ing/D): As, BaP Lead: Risk Asbestos: No risk	100	Soil (Ing/D/Inh): As Sb, Aroclor 1260, Mn, Zn, Co, Cd, Hg
	CTE	3E-06	Soil (Ing): As Lead: Risk Asbestos: No risk	54	Soil (Ing/D/Inh): Cd, As, Sb, A1260, Mn, Zn

TABLE RA-S2-49.CTE_0.8

RISK AND HAZARD SUMMARY
 RESIDENTIAL EXPOSURE, OU2 EXPOSURE AREA 2
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.9.2.CTE_0.8	Future	Resident	2	Surface Soil	Ingestion	1.60E-05	Arsenic Chromium, hexavalent Benzo(a)pyrene	9.9E-06 3.7E-06 1.8E-06	2.60E+00	NA	NA
					Dermal	7.90E-07	NA	NA	4.90E-02	NA	NA
					Inhalation	2.30E-08	NA	NA	3.00E-03	NA	NA
				Homegrown Produce from Surface Soil	Ingestion	3.80E-05	Arsenic Chromium, hexavalent Benzo(a)anthracene Benzo(b)fluoranthene Benzo(a)pyrene	1.7E-05 3.7E-06 1.6E-06 8.7E-06 6.4E-06	3.80E+01	Cadmium Zinc Copper Antimony	1.9E+01 1.4E+01 2.1E+00 1.5E+00
					Surface Soil Total	5.50E-05			4.00E+01		
				Subsurface Soil	Ingestion	1.60E-05	Arsenic Chromium, hexavalent Benzo(a)pyrene	9.3E-06 3.7E-06 1.8E-06	2.40E+00	NA	NA
					Dermal	7.60E-07	NA	NA	4.20E-02	NA	NA
					Inhalation	2.20E-08	NA	NA	2.90E-03	NA	NA
				Homegrown Produce from Subsurface Soil	Ingestion	3.70E-05	Arsenic Chromium, hexavalent Benzo(a)anthracene Benzo(b)fluoranthene Benzo(a)pyrene	1.6E-05 3.7E-06 1.6E-06 8.7E-06 6.4E-06	3.30E+01	Cadmium Zinc Copper Antimony	1.6E+01 1.2E+01 1.5E+00 1.5E+00
					Subsurface Soil Total	5.30E-05			3.50E+01		
				GW - MW15	Ingestion	2.30E-04	Arsenic Chromium, hexavalent	2.10E-04 1.40E-05	7.80E+00	Arsenic Cobalt	4.5E+00 1.2E+00
					Dermal	2.70E-06	Pentachlorophenol	1.70E-06	7.80E-02	NA	NA
					Inhalation	2.50E-13	NA	NA	--	NA	NA
				Indoor Air Household Use from MW15	Inhalation	4.90E-09	NA	NA	--	NA	NA
					Inhalation	9.20E-10	NA	NA	--	NA	NA
					GW - MW15 Total	2.30E-04			7.90E+00		
				GW - MW22	Ingestion	1.60E-04	Chromium, hexavalent Arsenic	1.20E-04 1.20E-04	6.90E+00	Iron Aluminum	2.2E+00 2.1E+00
					Dermal	9.10E-06	Chromium, hexavalent Indeno(1,2,3-cd)pyrene	6.90E-06 1.80E-06	1.10E-01	NA	NA
					Inhalation	8.00E-12	NA	NA	1.20E-06	NA	NA
				Indoor Air Household Use from MW22	Inhalation	3.50E-07	NA	NA	2.10E-03	NA	NA
					Inhalation	5.80E-08	NA	NA	1.20E-03	NA	NA
					GW - MW22 Total	1.70E-04			7.10E+00		
				SS + GW (MW15)		2.80E-04			4.90E+01		
					SB + GW (MW15)	2.80E-04			4.30E+01		
					SS + GW (MW22)	2.30E-04			4.80E+01		
					SB + GW (MW22)	2.20E-04			4.20E+01		

TABLE RA-S2-47.CTE_0.8

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 7
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 8 7 CTE_0 8	Current/ Future	Adult Recreationalist	7	Surface Soil	Ingestion	2 70E-08	NA	NA	2 60E-03	NA	NA
					Dermal	8 90E-09	NA	NA	4 60E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6 70E-10	NA	NA	3 70E-04	NA	NA
				Surface Soil Total	3 70E-08			3 40E-03			
				Surface Soil Total	3 70E-08			3 40E-03			

TABLE RA-S2-46A.CTE_0.8

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 5
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 8 5 CTE_0.8	Future	Adult Recreationalist	5	Surface Soil	Ingestion	1.10E-07	NA	NA	6.20E-03	NA	NA
					Dermal	1.10E-07	NA	NA	5.10E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.40E-09	NA	NA	2.50E-01	NA	NA
					Surface Soil Total	2.20E-07			2.60E-01		
				Subsurface Soil	Ingestion	5.60E-08	NA	NA	2.50E-03	NA	NA
					Dermal	5.20E-08	NA	NA	7.80E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.50E-08	NA	NA	1.50E-01	NA	NA
					Subsurface Soil Total	1.20E-07			1.50E-01		
				Surface Water	Ingestion	6.80E-09	NA	NA	1.40E-04	NA	NA
					Dermal	2.30E-08	NA	NA	2.00E-04	NA	NA
					Surface Water Total	3.00E-08			3.40E-04		
				Groundwater Outdoor Air Vapors -- MW30	Inhalation	1.20E-12	NA	NA	2.70E-08	NA	NA
					GW - MW30 Total	1.20E-12			2.70E-08		
					Surface Soil Total	2.50E-07			2.60E-01		
					Subsurface Soil Total	1.50E-07			1.50E-01		

TABLE RA-S2-46.CTE_0.8

RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 4
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 8 4 CTE_0.8	Future	Adult Recreationalist	4	Surface Soil	Ingestion	3.60E-07	NA	NA	6.50E-02	NA	NA
					Dermal	3.90E-07	NA	NA	7.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5.80E-10	NA	NA	2.50E-03	NA	NA
					Surface Soil Total	7.40E-07			1.40E-01		
				Subsurface Soil	Ingestion	1.90E-07	NA	NA	3.20E-02	NA	NA
					Dermal	1.90E-07	NA	NA	3.20E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.90E-10	NA	NA	1.50E-03	NA	NA
					Subsurface Soil Total	3.80E-07			6.60E-02		
						Surface Soil Total	7.40E-07		1.40E-01		
						Subsurface Soil Total	3.80E-07		6.60E-02		

TABLE RA-S2-45.CTE_0.8

**RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 3
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 8 3 CTE_0 8	Future	Adult Recreationalist	3	Surface Soil	Ingestion	2 00E-08	NA	NA	1 80E-03	NA	NA
					Dermal	7 00E-09	NA	NA	3 10E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5 70E-10	NA	NA	2 10E-04	NA	NA
						Surface Soil Total	2 70E-08			2 40E-03	
					Subsurface Soil	Ingestion	1 70E-08	NA	NA	1 80E-03	NA
				Dermal		6 10E-09	NA	NA	2 60E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5 70E-10	NA	NA	2 00E-04	NA	NA
						Subsurface Soil Total	2 40E-08			2 20E-03	
					Surface Water	Ingestion	1 40E-08	NA	NA	6 10E-03	NA
				Dermal		2 20E-08	NA	NA	5 20E-02	NA	NA
					Surface Water Total	3 50E-08			5 80E-02		
					SS + SW	6 30E-08			6 10E-02		
					SB + SW	5 90E-08			6 10E-02		

TABLE RA-S2-44.CTE_0.8

RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 2
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 8 2 CTE_0 8	Future	Adult Recreationalist	2	Surface Soil	Ingestion	1 30E-08	NA	NA	2 10E-03	NA	NA
					Dermal	4 50E-09	NA	NA	3 20E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5 10E-10	NA	NA	2 10E-04	NA	NA
					Surface Soil Total	1 80E-08			2 60E-03		
				Subsurface Soil	Ingestion	1 20E-08	NA	NA	1 90E-03	NA	NA
					Dermal	4 30E-09	NA	NA	2 80E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4 70E-10	NA	NA	2 00E-04	NA	NA
					Subsurface Soil Total	1 70E-08			2 40E-03		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	2 40E-12	NA	NA	--	NA	NA
					GW - MW15 Total	2 40E-12			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	4 90E-14	NA	NA	4 70E-08	NA	NA
					GW - M22 Total	4 90E-14			4 80E-08		
					SS + GW (MW15)	1 80E-08			2 60E-03		
					SB + GW (MW15)	1 70E-08			2 40E-03		
					SS + GW (MW22)	1 80E-08			2 60E-03		
					SB + GW (MW22)	1 70E-08			2 40E-03		

TABLE RA-S2-43.CTE_0.8

RISK AND HAZARD SUMMARY
 ADULT RECREATIONALIST, OU2 EXPOSURE AREA 1
 CENTRAL TENDENCY EXPOSURE
 MATTHESSEN AND HEGLER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 8 1 CTE_0 8	Future	Adult Recreationalist	1	Surface Soil	Ingestion	8 90E-08	NA	NA	6 50E-03	NA	NA
					Dermal	5 10E-08	NA	NA	2 00E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2 10E-09	NA	NA	1 80E-02	NA	NA
					Surface Soil Total	1 40E-07			2 70E-02		
				Subsurface Soil	Ingestion	6 90E-08	NA	NA	5 30E-03	NA	NA
					Dermal	3 80E-08	NA	NA	1 70E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1 40E-09	NA	NA	1 40E-02	NA	NA
					Subsurface Soil Total	1 10E-07			2 10E-02		
				Surface Water	Ingestion	1 60E-08	NA	NA	1 40E-02	NA	NA
					Dermal	1 50E-07	NA	NA	1 20E-01	NA	NA
				Surface Water Total	1 60E-07			1 30E-01			
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	2 40E-11	NA	NA	1 10E-05	NA	NA
					GW - MW04 Total	2 40E-11			1 10E-05		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	1 30E-13	NA	NA	1 70E-10	NA	NA
					GW - MW31 Total	1 30E-13			1 70E-10		
					SS + SW + GW (MW04)	3 10E-07			1 60E-01		
					SB + SW + GW (MW04)	2 80E-07			1 50E-01		
					SS + SW + GW (MW31)	3 10E-07			1 60E-01		
					SB + SW + GW (MW31)	2 80E-07			1 50E-01		

TABLE RA-S2-42.CTE_0.8

**RISK AND HAZARD SUMMARY
 ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 7
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.7 CTE_0.8	Current/ Future	Adolescent Recreationalist	7	Surface Soil	Ingestion	3.20E-08	NA	NA	2.60E-03	NA	NA
					Dermal	9.90E-09	NA	NA	4.60E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.20E-09	NA	NA	3.70E-04	NA	NA
				Surface Soil Total	4.40E-08			3.40E-03			
				Surface Soil Total	4.40E-08			3.40E-03			

TABLE RA-S2-41A.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 5
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard				
S7 7 5 CTE 0 8	Future	Adolescent Recreationalist	5	Surface Soil	Ingestion	2 70E-07	NA	NA	6 20E-03	NA	NA				
					Dermal	3 00E-07	NA	NA	5 10E-03	NA	NA				
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5 20E-09	NA	NA	2 40E-01	NA	NA				
					Surface Soil Total	5 80E-07			2 50E-01						
				Subsurface Soil	Ingestion	1 50E-07	NA	NA	2 50E-03	NA	NA				
					Dermal	1 60E-07	NA	NA	7 80E-04	NA	NA				
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1 60E-08	NA	NA	1 40E-01	NA	NA				
					Subsurface Soil Total	3 20E-07			1 40E-01						
				Surface Water	Ingestion	8 20E-09	NA	NA	1 40E-04	NA	NA				
					Dermal	5 20E-08	NA	NA	2 00E-04	NA	NA				
					Surface Water Total	6 00E-08			3 40E-04						
				Groundwater Outdoor Air Vapors -- MW30	Inhalation	1 30E-11	NA	NA	2 70E-08	NA	NA				
					GW - MW30 Total	1 30E-11			2 70E-08						
				SS + SW + GW (MW30)						6 40E-07			2 50E-01		
				SB + SW + GW (MW30)						3 80E-07			1 40E-01		

TABLE RA-S2-41.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 4
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 7 4 CTE_0 8	Future	Adolescent Recreationalist	4	Surface Soil	Ingestion	4 10E-07	NA	NA	6 50E-02	NA	NA
					Dermal	4 40E-07	NA	NA	7 00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9 60E-10	NA	NA	2 50E-03	NA	NA
					Surface Soil Total	8 50E-07			1 40E-01		
				Subsurface Soil	Ingestion	2 30E-07	NA	NA	3 20E-02	NA	NA
					Dermal	2 20E-07	NA	NA	3 20E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8 40E-10	NA	NA	1 50E-03	NA	NA
					Subsurface Soil Total	4 50E-07			6 60E-02		
					Surface Soil Total	8 50E-07			1 40E-01		
					Subsurface Soil Total	4 50E-07			6 60E-02		

TABLE RA-S2-40.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 3
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S773 CTE_0.8	Future	Adolescent Recreationalist	3	Surface Soil	Ingestion	2.50E-08	NA	NA	1.80E-03	NA	NA
					Dermal	9.40E-09	NA	NA	3.10E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-09	NA	NA	2.10E-04	NA	NA
					Surface Soil Total	3.60E-08			2.40E-03		
					Subsurface Soil	Ingestion	2.30E-08	NA	NA	1.80E-03	NA
				Dermal		8.40E-09	NA	NA	2.60E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.10E-09	NA	NA	2.00E-04	NA	NA
					Subsurface Soil Total	3.20E-08			2.20E-03		
					Surface Water	Ingestion	1.60E-08	NA	NA	6.10E-03	NA
				Dermal		5.50E-08	NA	NA	5.20E-02	NA	NA
				Surface Water Total		7.10E-08			5.80E-02		
					SS + SW	1.10E-07			6.10E-02		
					SB + SW	1.00E-07			6.10E-02		

TABLE RA-S2-39.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.7.2.CTE_0.8	Future	Adolescent Recreationalist	2	Surface Soil	Ingestion	1.70E-08	NA	NA	2.10E-03	NA	NA			
					Dermal	6.50E-09	NA	NA	3.20E-04	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9.20E-10	NA	NA	2.10E-04	NA	NA			
					Surface Soil Total	2.50E-08			2.60E-03					
				Subsurface Soil	Ingestion	1.60E-08	NA	NA	1.90E-03	NA	NA			
					Dermal	6.30E-09	NA	NA	2.80E-04	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8.70E-10	NA	NA	2.00E-04	NA	NA			
					Subsurface Soil Total	2.40E-08			2.40E-03					
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	1.10E-14	NA	NA	--	NA	NA			
					GW - MW15 Total	1.10E-14			--					
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	6.30E-14	NA	NA	4.70E-08	NA	NA			
					GW - M22 Total	6.30E-14			4.70E-08					
								SS + GW (MW15)	2.50E-08			2.60E-03		
								SB + GW (MW15)	2.40E-08			2.40E-03		
								SS + GW (MW22)	2.50E-08			2.60E-03		
								SB + GW (MW22)	2.40E-08			2.40E-03		

TABLE RA-S2-38.CTE_0.8

**RISK AND HAZARD SUMMARY
 ADOLESCENT RECREATIONALIST, OU2 EXPOSURE AREA 1
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.7.1.CTE_0.8	Future	Adolescent Recreationalist	1	Surface Soil	Ingestion	1.40E-07	NA	NA	6.50E-03	NA	NA
					Dermal	1.10E-07	NA	NA	2.00E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3.00E-09	NA	NA	1.70E-02	NA	NA
					Surface Soil Total	2.50E-07			2.60E-02		
				Subsurface Soil	Ingestion	1.10E-07	NA	NA	5.30E-03	NA	NA
					Dermal	6.60E-07	NA	NA	1.50E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.10E-09	NA	NA	1.30E-02	NA	NA
					Subsurface Soil Total	7.70E-07			3.30E-02		
				Surface Water	Ingestion	2.40E-08	NA	NA	1.40E-02	NA	NA
					Dermal	4.60E-07	NA	NA	1.20E-01	NA	NA
				Surface Water Total	4.90E-07			1.30E-01			
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	5.10E-11	NA	NA	1.20E-05	NA	NA
					GW - MW04 Total	5.10E-11			1.20E-05		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	1.50E-13	NA	NA	1.90E-10	NA	NA
					GW - MW31 Total	1.50E-13			1.90E-10		
					SS + SW + GW (MW04)	7.40E-07			1.60E-01		
					SB + SW + GW (MW04)	1.30E-06			1.70E-01		
					SS + SW + GW (MW31)	7.40E-07			1.60E-01		
					SB + SW + GW (MW31)	1.30E-06			1.70E-01		

TABLE RA-S2-37.CTE_0.8

**RISK AND HAZARD SUMMARY
 CHILD RECREATIONALIST, OU2 EXPOSURE AREA 7
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.7.CTE_0.8	Current/ Future	Child Recreationalis t	7	Surface Soil	Ingestion	2.00E-07	NA	NA	2.40E-02	NA	NA
					Dermal	5.50E-08	NA	NA	4.20E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-09	NA	NA	3.70E-04	NA	NA
					Surface Soil Total	2.50E-07			2.90E-02		
					Surface Soil Total	2.50E-07			2.90E-02		

TABLE RA-S2-36A.CTE_0.8
RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 5
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.5.CTE_0.8	Future	Child Recreationalist	5	Surface Soil	Ingestion	2.50E-06	Benzo(a)pyrene	1.50E-06	5.80E-02	NA	NA
					Dermal	2.80E-06	Benzo(a)pyrene	1.80E-06	4.70E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.30E-09	NA	NA	3.00E-01	NA	NA
					Surface Soil Total	5.40E-06			4.10E-01		
				Subsurface Soil	Ingestion	1.40E-06	NA	NA	2.30E-02	NA	NA
					Dermal	1.50E-06	NA	NA	7.10E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.30E-08	NA	NA	1.80E-01	NA	NA
					Subsurface Soil Total	2.90E-06			2.10E-01		
				Surface Water	Ingestion	1.20E-08	NA	NA	3.20E-04	NA	NA
					Dermal	8.80E-08	NA	NA	3.60E-04	NA	NA
					Surface Water Total	1.00E-07			6.80E-04		
				Groundwater Outdoor Air Vapors – MW30	Inhalation	1.00E-11	NA	NA	2.70E-08	NA	NA
					GW - MW30 Total	1.00E-11			2.70E-08		
					Surface Soil Total	5.50E-06			4.10E-01		
					Subsurface Soil Total	3.00E-06			2.10E-01		

TABLE RA-S2-36.CTE_0.8

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 4
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.4.CTE_0.8	Future	Child Recreationalist	4	Surface Soil	Ingestion	2.40E-06	Aroclor 1260	1.70E-06	6.10E-01	NA	NA
					Dermal	2.50E-06	Aroclor 1260	2.20E-06	6.40E-01	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	7.90E-10	NA	NA	2.50E-03	NA	NA
					Surface Soil Total	4.90E-06			1.20E+00		
				Subsurface Soil	Ingestion	1.30E-06	NA	NA	3.00E-01	NA	NA
					Dermal	1.30E-06	Aroclor 1260	1.00E-06	3.00E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	7.10E-10	NA	NA	1.50E-03	NA	NA
					Subsurface Soil Total	2.60E-06			6.00E-01		
						Surface Soil Total	4.90E-06		1.20E+00		
						Subsurface Soil Total	2.60E-06		6.00E-01		

TABLE RA-S2-35.CTE_0.8

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 3
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.3.CTE_0.8	Future	Child Recreationalist	3	Surface Soil	Ingestion	1.70E-07	NA	NA	1.70E-02	NA	NA
					Dermal	6.30E-08	NA	NA	2.90E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9.70E-10	NA	NA	2.10E-04	NA	NA
					Surface Soil Total	2.30E-07			2.00E-02		
					Subsurface Soil	Ingestion	1.50E-07	NA	NA	1.70E-02	NA
				Dermal		5.70E-08	NA	NA	2.40E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.00E-09	NA	NA	2.00E-04	NA	NA
					Subsurface Soil Total	2.10E-07			1.90E-02		
					Surface Water	Ingestion	2.30E-08	NA	NA	1.40E-02	NA
				Dermal		9.70E-08	NA	NA	9.30E-02	NA	NA
					Surface Water Total	1.20E-07			1.10E-01		
					SS + SW	3.50E-07			1.30E-01		
					SB + SW	3.30E-07			1.30E-01		

TABLE RA-S2-34.CTE_0.8

**RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.2.CTE_0.8	Future	Child Recreationalist	2	Surface Soil	Ingestion	1.20E-07	NA	NA	2.00E-02	NA	NA
					Dermal	4.50E-08	NA	NA	2.90E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	8.00E-10	NA	NA	2.10E-04	NA	NA
					Surface Soil Total	1.60E-07			2.30E-02		
				Subsurface Soil	Ingestion	1.10E-07	NA	NA	1.80E-02	NA	NA
					Dermal	4.40E-08	NA	NA	2.50E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	7.70E-10	NA	NA	2.00E-04	NA	NA
					Subsurface Soil Total	1.60E-07			2.10E-02		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation	6.60E-15	NA	NA	--	NA	NA
					GW - MW15 Total	6.60E-15			-		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	2.10E-13	NA	NA	4.80E-08	NA	NA
					GW - M22 Total	2.10E-13			4.80E-08		
						SS + GW (MW15)	1.60E-07		2.30E-02		
						SB + GW (MW15)	1.60E-07		2.10E-02		
						SS + GW (MW22)	1.60E-07		2.30E-02		
						SB + GW (MW22)	1.60E-07		2.10E-02		

TABLE RA-S2-33.CTE_0.8

RISK AND HAZARD SUMMARY
CHILD RECREATIONALIST, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.6.1.CTE_0.8	Future	Child Recreationalist	1	Surface Soil	Ingestion	1.10E-06	NA	NA	6.00E-02	NA	NA
					Dermal	9.10E-07	NA	NA	1.80E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.40E-09	NA	NA	2.20E-02	NA	NA
					Surface Soil Total	2.00E-06			1.00E-01		
				Subsurface Soil	Ingestion	8.10E-07	NA	NA	4.90E-02	NA	NA
					Dermal	6.40E-07	NA	NA	1.60E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.70E-09	NA	NA	1.70E-02	NA	NA
					Subsurface Soil Total	1.50E-06			8.20E-02		
				Surface Water	Ingestion	4.40E-08	NA	NA	3.30E-02	NA	NA
					Dermal	8.60E-07	NA	NA	2.10E-01	NA	NA
				Surface Water Total		9.00E-07			2.40E-01		
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	4.70E-11	NA	NA	1.10E-05	NA	NA
					GW - MW04 Total	4.70E-11			1.10E-05		
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	8.90E-14	NA	NA	1.70E-10	NA	NA
					GW - MW31 Total	8.90E-14			1.70E-10		
						SS + SW + GW (MW04)	2.90E-06		3.40E-01		
						SB + SW + GW (MW04)	2.40E-06		3.20E-01		
						SS + SW + GW (MW31)	2.90E-06		3.40E-01		
						SB + SW + GW (MW31)	2.40E-06		3.20E-01		

TABLE RA-S2-32.CTE_0.8

**RISK AND HAZARD SUMMARY
 ADULT TRESPASSER, OU2 EXPOSURE AREA 5
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 5 5 CTE_0.8	Current/ Future	Trespasser Adult	5	Surface Soil	Ingestion	1 10E-07	NA	NA	6 20E-03	NA	NA
					Dermal	1 10E-07	NA	NA	5 10E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4 40E-09	NA	NA	2 50E-01	NA	NA
					Surface Soil Total	2 20E-07			2 60E-01		
				Subsurface Soil	Ingestion	5 60E-08	NA	NA	2 50E-03	NA	NA
					Dermal	5 20E-08	NA	NA	7 80E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1 50E-08	NA	NA	1 50E-01	NA	NA
					Subsurface Soil Total	1 20E-07			1 50E-01		
				Surface Water	Ingestion	6 80E-09	NA	NA	1 40E-04	NA	NA
					Dermal	4 90E-08	NA	NA	4 30E-04	NA	NA
				Surface Water Total	5 60E-08			5 70E-04			
				Groundwater Outdoor Air Vapors– MW30	Inhalation	9 20E-12	NA	NA	2 70E-08	NA	NA
					GW - MW30 Total	9 20E-12			2 70E-08		
					SS + SW + GW (MW30)	2 80E-07			2 60E-01		
					SB + SW + GW (MW30)	1 80E-07			1 50E-01		

TABLE RA-S2-31.CTE_0.8

RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 4
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7 5 4 CTE_0 8	Current/ Future	Trespasser Adult	4	Surface Soil	Ingestion	3 60E-07	NA	NA	6 50E-02	NA	NA	
					Dermal	3 90E-07	NA	NA	7 00E-02	NA	NA	
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5 80E-10	NA	NA	2 50E-03	NA	NA	
						Surface Soil Total	7 40E-07			1 40E-01		
						Subsurface Soil	Ingestion	1 90E-07	NA	NA	3 20E-02	NA
				Dermal	1 90E-07		NA	NA	3 20E-02	NA	NA	
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4 90E-10	NA	NA	1 50E-03	NA	NA	
						Subsurface Soil Total	3 80E-07			6 60E-02		
						Surface Soil Total	7 40E-07			1 40E-01		
				Subsurface Soil Total	3 80E-07			6 60E-02				

TABLE RA-S2-30.CTE_0.8

RISK AND HAZARD SUMMARY
 ADULT TRESPASSER, OU2 EXPOSURE AREA 3
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 5 3 CTE 0 8	Current/ Future	Trespasser Adult	3	Surface Soil	Ingestion	2 00E-08	NA	NA	1 80E-03	NA	NA
					Dermal	7 00E-09	NA	NA	3 10E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5 70E-10	NA	NA	2 10E-04	NA	NA
					Surface Soil Total	2 70E-08			2 40E-03		
					Subsurface Soil	Ingestion	1 70E-08	NA	NA	1 80E-03	NA
				Dermal		6 10E-09	NA	NA	2 60E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5 70E-10	NA	NA	2 00E-04	NA	NA
					Subsurface Soil Total	2 40E-08			2 20E-03		
					Surface Water	Ingestion	1 40E-08	NA	NA	6 10E-03	NA
				Dermal		4 60E-08	NA	NA	1 10E-01	NA	NA
				Surface Water Total	6 00E-08			1 20E-01			
					SS + SW	8 70E-08			1 20E-01		
					SB + SW	8 30E-08			1 20E-01		

TABLE RA-S2-29.CTE_0.8

RISK AND HAZARD SUMMARY
 ADULT TRESPASSER, OU2 EXPOSURE AREA 2
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7 5 2 CTE_0.8	Current/ Future	Trespasser Adult	2	Surface Soil	Ingestion	1.30E-08	NA	NA	2.10E-03	NA	NA	
					Dermal	4.50E-09	NA	NA	3.20E-04	NA	NA	
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation		5.10E-10	NA	NA	2.10E-04	NA	NA
						Surface Soil Total	1.80E-08			2.60E-03		
				Subsurface Soil	Ingestion	1.20E-08	NA	NA	1.90E-03	NA	NA	
					Dermal	4.30E-09	NA	NA	2.80E-04	NA	NA	
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation		4.70E-10	NA	NA	2.00E-04	NA	NA
						Subsurface Soil Total	1.70E-08			2.40E-03		
				Groundwater Outdoor Air Vapors-- MW15	Inhalation		9.90E-15	NA	NA	--	NA	NA
						GW - MW15 Total	9.90E-15			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation		5.70E-14	NA	NA	4.70E-08	NA	NA
						GW - M22 Total	5.70E-14			4.70E-08		
							SS + GW (MW15)	1.80E-08		2.60E-03		
							SB + GW (MW15)	1.70E-08		2.40E-03		
			SS + GW (MW22)	1.80E-08		2.60E-03						
			SB + GW (MW22)	1.70E-08		2.40E-03						

TABLE RA-S2-28.CTE_0.8

**RISK AND HAZARD SUMMARY
ADULT TRESPASSER, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7 5 1 CTE_0.8	Current/ Future	Trespasser Adult	1	Surface Soil	Ingestion	8.90E-08	NA	NA	6.50E-03	NA	NA			
					Dermal	5.10E-08	NA	NA	2.00E-03	NA	NA			
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation									
							2.10E-09	NA	NA	1.80E-02	NA	NA		
						Surface Soil Total	1.40E-07			2.70E-02				
				Subsurface Soil	Ingestion									
						Dermal	3.80E-08	NA	NA	1.70E-03	NA	NA		
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation									
							1.40E-09	NA	NA	1.40E-02	NA	NA		
						Subsurface Soil Total	1.10E-07			2.10E-02				
				Surface Water	Ingestion									
						Dermal	3.30E-07	NA	NA	2.50E-01	NA	NA		
				Surface Water Total	3.40E-07			2.60E-01						
				Groundwater Outdoor Air Vapors-- MW04	Inhalation									
							2.40E-11	NA	NA	1.10E-05	NA	NA		
				GW - MW04 Total	2.40E-11			1.10E-05						
				Groundwater Outdoor Air Vapors-- MW31	Inhalation									
							1.30E-13	NA	NA	1.70E-10	NA	NA		
				GW - MW31 Total	1.30E-13			1.70E-10						
					SS + SW + GW (MW04)	4.80E-07			2.90E-01					
	SB + SW + GW (MW04)	4.50E-07			2.80E-01									
	SS + SW + GW (MW31)	4.80E-07			2.90E-01									
	SB + SW + GW (MW31)	4.50E-07			2.80E-01									

TABLE RA-S2-27.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 5
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 4 5 CTE_0.8	Current/ Future	Trespasser Adolescent	5	Surface Soil	Ingestion	2.70E-07	NA	NA	6.20E-03	NA	NA
					Dermal	3.00E-07	NA	NA	5.10E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	5.20E-09	NA	NA	2.40E-01	NA	NA
					Surface Soil Total	5.80E-07			2.50E-01		
				Subsurface Soil	Ingestion	1.50E-07	NA	NA	2.50E-03	NA	NA
					Dermal	1.60E-07	NA	NA	7.80E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.60E-08	NA	NA	1.40E-01	NA	NA
					Subsurface Soil Total	3.20E-07			1.40E-01		
				Surface Water	Ingestion	8.20E-09	NA	NA	1.40E-04	NA	NA
					Dermal	5.30E-08	NA	NA	2.00E-04	NA	NA
					Surface Water Total	6.10E-08			3.40E-04		
				Groundwater Outdoor Air Vapors-- MW30	Inhalation	1.30E-11	NA	NA	2.70E-08	NA	NA
					GW - MW30 Total	1.30E-11			2.70E-08		
					SS + SW + GW (MW30)	6.40E-07			2.50E-01		
					SB + SW + GW (MW30)	3.80E-07			1.40E-01		

TABLE RA-S2-26.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 4
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 4 4 CTE_0 8	Current/ Future	Trespasser Adolescent	4	Surface Soil	Ingestion	4 10E-07	NA	NA	6 50E-02	NA	NA
					Dermal	4 40E-07	NA	NA	7 00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9 60E-10	NA	NA	2 50E-03	NA	NA
						Surface Soil Total	8 50E-07			1 40E-01	
				Subsurface Soil	Ingestion	2 30E-07	NA	NA	3 20E-02	NA	NA
						Dermal	2 20E-07	NA	NA	3 20E-02	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8 40E-10	NA	NA	1 50E-03	NA	NA
						Subsurface Soil Total	4 50E-07			6 60E-02	
				Surface Soil Total	8 50E-07			1 40E-01			
				Subsurface Soil Total	4 50E-07			6 60E-02			

TABLE RA-S2-25.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 3
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.4.3.CTE_0.8	Current/ Future	Trespasser Adolescent	3	Surface Soil	Ingestion	2.50E-08	NA	NA	1.80E-03	NA	NA
					Dermal	9.40E-09	NA	NA	3.10E-04	NA	NA
	Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1.10E-09	NA	NA	2.10E-04	NA	NA			
			Surface Soil Total	3.60E-08			2.40E-03				
	Subsurface Soil	Ingestion	2.30E-08	NA	NA	1.80E-03	NA	NA			
			Dermal	8.40E-09	NA	NA	2.60E-04	NA	NA		
	Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.10E-09	NA	NA	2.00E-04	NA	NA			
			Subsurface Soil Total	3.20E-08			2.20E-03				
	Surface Water	Ingestion	1.60E-08	NA	NA	6.10E-03	NA	NA			
			Dermal	5.60E-08	NA	NA	5.20E-02	NA	NA		
	Surface Water Total	7.10E-08			5.80E-02						
	SS + SW	1.10E-07			6.10E-02						
	SB + SW	1.00E-07			6.10E-02						

TABLE RA-S2-24.CTE_0.8

RISK AND HAZARD SUMMARY
ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 4 2 CTE_0 8	Current/ Future	Trespasser Adolescent	2	Surface Soil	Ingestion	1 70E-08	NA	NA	2 10E-03	NA	NA
					Dermal	6 50E-09	NA	NA	3 20E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	9 20E-10	NA	NA	2 10E-04	NA	NA
					Surface Soil Total	2 50E-08			2 60E-03		
					Subsurface Soil	Ingestion	1 60E-08	NA	NA	1 90E-03	NA
				Dermal		6 30E-09	NA	NA	2 80E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8 70E-10	NA	NA	2 00E-04	NA	NA
					Subsurface Soil Total	2 40E-08			2 40E-03		
					Groundwater Outdoor Air Vapors-- MW15	Inhalation	1 10E-14	NA	NA	--	NA
				GW - MW15 Total		1 10E-14			--		
				Groundwater Outdoor Air Vapors-- MW22	Inhalation	3 50E-13	NA	NA	4 80E-08	NA	NA
					GW - M22 Total	3 50E-13			4 80E-08		
					SS + GW (MW15)	2 50E-08			2 60E-03		
					SB + GW (MW15)	2 40E-08			2 40E-03		
					SS + GW (MW22)	2 50E-08			2 60E-03		
					SB + GW (MW22)	2 40E-08			2 40E-03		

TABLE RA-S2-23.CTE_0.8

RISK AND HAZARD SUMMARY
 ADOLESCENT TRESPASSER, OU2 EXPOSURE AREA 1
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard				
S7 4 1 CTE_0 8	Current/ Future	Trespasser Adolescent	1	Surface Soil	Ingestion	1 40E-07	NA	NA	6 50E-03	NA	NA				
					Dermal	1 10E-07	NA	NA	2 00E-03	NA	NA				
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	3 00E-09	NA	NA	1 70E-02	NA	NA				
						Surface Soil Total	2 50E-07		2 60E-02						
				Subsurface Soil	Ingestion	1 10E-07	NA	NA	5 30E-03	NA	NA				
					Dermal	7 70E-08	NA	NA	1 70E-03	NA	NA				
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2 10E-09	NA	NA	1 30E-02	NA	NA				
						Subsurface Soil Total	1 90E-07		2 00E-02						
				Surface Water	Ingestion	2 40E-08	NA	NA	1 40E-02	NA	NA				
					Dermal	4 70E-07	NA	NA	1 20E-01	NA	NA				
				Surface Water Total	4 90E-07		1 30E-01								
				Groundwater Outdoor Air Vapors-- MW04	Inhalation	5 10E-11	NA	NA	1 10E-05	NA	NA				
						GW - MW04 Total	5 10E-11		1 10E-05						
				Groundwater Outdoor Air Vapors-- MW31	Inhalation	1 50E-13	NA	NA	1 70E-10	NA	NA				
						GW - MW31 Total	1 50E-13		1 70E-10						
									SS + SW + GW (MW04)	7 50E-07			1 60E-01		
									SB + SW + GW (MW04)	6 80E-07			1 50E-01		
									SS + SW + GW (MW31)	7 50E-07			1 60E-01		
									SB + SW + GW (MW31)	6 80E-07			1 50E-01		

TABLE RA-S2-22B.CTE_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 6
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.6B.CTE_0.8	Current/ Future	Construction Worker	6	Surface Soil	Ingestion	1.60E-07	NA	NA	7.80E-01	NA	NA
					Dermal	1.90E-08	NA	NA	4.20E-02	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	4.10E-10	NA	NA	8.90E-02	NA	NA
				Surface Soil Total		1.80E-07			9.10E-01		
No groundwater exposures, risks, hazards											

TABLE RA-S2-22.CTE_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 6
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7 3 6 CTE_0 8	Current/ Future	Construction Worker	6	Surface Soil	Ingestion	3 60E-08	NA	NA	2 30E-01	NA	NA
					Dermal	4 10E-09	NA	NA	9 60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	1 40E-10	NA	NA	2 40E-02	NA	NA
					Surface Soil Total	4 00E-08			2 60E-01		
No groundwater exposures, risks, hazards											

TABLE RA-S2-21B.CTE_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 5
CENTRAL TENDENCY EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard			
S7.3.5B.CTE_0.8	Current/ Future	On-Site Construction Worker	5	Subsurface Soil	Ingestion	1.20E-06	NA	NA	2.60E+00	NA	NA			
					Dermal	4.30E-07	NA	NA	4.00E-01	NA	NA			
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.80E-07	NA	NA	2.50E+02	Cyanide	2.50E+02			
				Subsurface Soil Total					1.90E-06			2.50E+02		
				GW, Trench (MW29)	Inhalation	--	NA	NA	5.00E-03	NA	NA			
					GW - MW29 Total					--			5.00E-03	
				GW, Trench (MW30)	Inhalation	9.70E-09	NA	NA	2.30E-03	NA	NA			
					GW - MW30 Total					9.70E-09			2.30E-03	
				SB + GW (MW29)					1.90E-06			2.50E+02		
				SB + GW (MW30)					1.90E-06			2.50E+02		

TABLE RA-S2-21.CTE_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 5
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard		
S7.3.5.CTE_0.8	Current/ Future	On-Site Construction Worker	5	Subsurface Soil	Ingestion	1.40E-07	NA	NA	4.90E-01	NA	NA		
					Dermal	4.80E-08	NA	NA	5.60E-02	NA	NA		
	Outdoor Air Particulates and Vapors from Subsurface Soil					Inhalation	2.80E-08	NA	NA	2.20E+01	Cyanide	2.20E+01	
						Subsurface Soil Total	2.20E-07			2.20E+01			
						GW, Trench (MW29)	Inhalation	--	NA	NA	5.00E-03	NA	NA
						GW - MW29 Total	--			5.00E-03			
						GW, Trench (MW30)	Inhalation	9.70E-09	NA	NA	2.30E-03	NA	NA
						GW - MW30 Total	9.70E-09			2.30E-03			
							SB + GW (MW29)	2.20E-07			2.30E+01		
							SB + GW (MW30)	2.30E-07			2.20E+01		

TABLE RA-S2-20B.CTE_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 4
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.4B.CTE_0.8	Current/ Future	On-Site Construction Worker	4	Subsurface Soil	Ingestion	9.90E-07	NA	NA	1.40E+01	Arcolor 1260	11
					Dermal	3.70E-07	NA	NA	5.00E+00	Arcolor 1260	5
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.40E-10	NA	NA	1.90E-01	NA	NA
				Subsurface Soil Total					1.40E-06		

TABLE RA-S2-20.CTE_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 4
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.4.CTE_0.8	Current/ Future	On-Site Construction Worker	4	Subsurface Soil	Ingestion	4.90E-07	NA	NA	6.40E+00	Arcolor 1260	4.90E+00
					Dermal	1.70E-07	NA	NA	2.30E+00	Arcolor 1260	2.30E+00
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.10E-10	NA	NA	7.60E-02	NA	NA
				Subsurface Soil Total					6.60E-07		

No groundwater exposures, risks, hazards

TABLE RA-S2-19B.CTE_0.8

**RISK AND HAZARD SUMMARY
 CONSTRUCTION WORKER, OU2 EXPOSURE AREA 3
 CENTRAL TENDENCY EXPOSURE -- MAXIMUM CONCENTRATIONS
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.3B.CTE_0.8	Current/ Future	On-Site Construction Worker	3	Subsurface Soil	Ingestion	2.70E-07	NA	NA	1.30E+00	NA	NA
					Dermal	3.30E-08	NA	NA	8.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.30E-09	NA	NA	3.10E-02	NA	NA
					Subsurface Soil Total	3.00E-07			1.40E+00		
				Groundwater	Ingestion	5.90E-11	NA	NA	1.50E-02	NA	NA
				Groundwater	Dermal	9.00E-09	NA	NA	1.90E-01	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	9.10E-09			2.00E-01		
					SB + GW	3.10E-07			1.60E+00		

TABLE RA-S2-19.CTE_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 3
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.3.CTE_0.8	Current/ Future	On-Site Construction Worker	3	Subsurface Soil	Ingestion	4.40E-08	NA	NA	3.50E-01	NA	NA
					Dermal	5.60E-09	NA	NA	1.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.60E-10	NA	NA	1.00E-02	NA	NA
					Subsurface Soil Total	4.90E-08			3.80E-01		
				Groundwater	Ingestion	5.90E-11	NA	NA	1.50E-02	NA	NA
				Groundwater	Dermal	9.00E-09	NA	NA	1.90E-01	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
					Groundwater Total	9.10E-09			2.00E-01		
					SB + GW	5.90E-08			5.90E-01		

TABLE RA-S2-18B.CTE_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.2B.CTE_0.8	Current/ Future	On-Site Construction Worker	2	Subsurface Soil	Ingestion	2.00E-07	NA	NA	1.40E+00	NA	NA
					Dermal	2.50E-08	NA	NA	7.30E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	7.90E-10	NA	NA	3.10E-02	NA	NA
					Subsurface Soil Total	2.30E-07			1.50E+00		
				Groundwater (MW15)	Ingestion	4.00E-09	NA	NA	9.30E-03	NA	NA
				Groundwater (MW15)	Dermal	1.80E-08	NA	NA	4.50E-02	NA	NA
				GW, Trench (MW15)	Inhalation	3.40E-10	NA	NA	--	NA	NA
					GW - MW4 Total	2.20E-08			5.40E-02		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	2.10E-10	NA	NA	6.40E-03	NA	NA
					GW - MW31 Total	2.10E-10			6.40E-03		
					SB + GW (MW15)	2.50E-07			1.50E+00		
					SB + GW (MW22)	2.30E-07			1.50E+00		

TABLE RA-S2-18.CTE_0.8

**RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.2.CTE_0.8	Current/ Future	On-Site Construction Worker	2	Subsurface Soil	Ingestion	3.10E-08	NA	NA	3.80E-01	NA	NA
					Dermal	4.00E-09	NA	NA	2.00E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	3.00E-10	NA	NA	1.00E-02	NA	NA
					Subsurface Soil Total	3.50E-08			4.10E-01		
				Groundwater (MW15)	Ingestion	4.00E-09	NA	NA	9.30E-03	NA	NA
				Groundwater (MW15)	Dermal	1.80E-08	NA	NA	4.50E-02	NA	NA
				GW, Trench (MW15)	Inhalation	3.40E-10	NA	NA	--	NA	NA
					GW - MW4 Total	2.20E-08			5.40E-02		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	2.10E-10	NA	NA	6.40E-03	NA	NA
					GW - MW31 Total	2.10E-10			6.40E-03		
					SB + GW (MW15)	5.70E-08			4.70E-01		
					SB + GW (MW22)	3.80E-08			4.20E-01		

TABLE RA-S2-17B.CTE_0.8

**RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard	
S7.3.1B.CTE_0.8	Current/ Future	On-Site Construction Worker	1	Subsurface Soil	Ingestion	2.70E-06	Arsenic	1.60E-06	2.00E+01	Cadmium Arsenic Antimony Aroclor 1260 Manganese Zinc	7.5 2.2 2.7 2.0 1.8 1.4	
					Dermal	6.50E-07	NA	NA	2.30E+00	NA	NA	
					Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.60E-08	NA	NA	3.10E+01	Mercury	3.10E+01
					Subsurface Soil Total	3.40E-06			5.40E+01			
					GW, Trench (MW04)	Inhalation	2.60E-08	NA	NA	4.20E-02	NA	NA
					GW - MW4 Total	2.60E-08			4.20E-02			
					GW, Trench (MW31)	Inhalation	1.50E-10	NA	NA	1.90E-05	NA	NA
					GW - MW31 Total	1.50E-10			1.90E-05			
					SB + GW (MW04)	3.40E-06			5.40E+01			
					SB + GW (MW31)	3.40E-06			5.40E+01			

TABLE RA-S2-17.CTE_0.8

RISK AND HAZARD SUMMARY
CONSTRUCTION WORKER, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.3.1.CTE_0.8	Current/ Future	On-Site Construction Worker	1	Subsurface Soil	Ingestion	1.70E-07	NA	NA	1.10E+00	NA	NA
					Dermal	3.50E-08	NA	NA	1.20E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.40E-09	NA	NA	2.00E+00	Mercury	2.00E+00
					Subsurface Soil Total	2.10E-07			3.20E+00		
				GW, Trench (MW04)	Inhalation	2.60E-08	NA	NA	4.20E-02	NA	NA
					GW - MW4 Total	2.60E-08			4.20E-02		
				GW, Trench (MW31)	Inhalation	1.50E-10	NA	NA	1.90E-05	NA	NA
					GW - MW31 Total	1.50E-10			1.90E-05		
					SB + GW (MW04)	2.40E-07			3.20E+00		
					SB + GW (MW31)	2.10E-07			3.20E+00		

TABLE RA-S2-16B.CTE_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 6
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.6B.CTE_0.8	Current/ Future	Utility Worker	6	Surface Soil	Ingestion	4.90E-07	NA	NA	3.00E-02	NA	NA
					Dermal	5.80E-08	NA	NA	1.60E-03	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	6.20E-10	NA	NA	8.10E-04	NA	NA
				Surface Soil Total		5.50E-07			3.20E-02		
No groundwater exposures, risks, hazards											

TABLE RA-S2-16.CTE_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 6
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.6.CTE_0.8	Current/ Future	Utility Worker	6	Surface Soil	Ingestion	1.10E-07	NA	NA	8.70E-03	NA	NA
					Dermal	1.20E-08	NA	NA	3.70E-04	NA	NA
				Outdoor Air Particulates and Vapors from Surface Soil	Inhalation	2.00E-10	NA	NA	2.20E-04	NA	NA
				Surface Soil Total		1.20E-07			9.30E-03		
No groundwater exposures, risks, hazards											

TABLE RA-S2-15B.CTE_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 5
CENTRAL TENDENCY EXPOSURE -- MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.5B.CTE_0.8	Current/ Future	On-Site Utility Worker	5	Subsurface Soil	Ingestion	3.50E-06	Benzo(a)pyrene	1.80E-06	1.00E-01	NA	NA
					Dermal	1.30E-06	NA	NA	1.60E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.40E-07	NA	NA	1.60E+00	Cyanide	1.60E+00
				Subsurface Soil Total	4.90E-06			1.70E+00			
				GW, Trench (MW29)	Inhalation	--	NA	NA	1.90E-04	NA	NA
				GW - MW29 Total	--			1.90E-04			
				GW, Trench (MW30)	Inhalation	2.90E-08	NA	NA	8.90E-05	NA	NA
				GW - MW30 Total	2.90E-08			8.90E-05			
				SB + GW (MW29)	4.90E-06			1.70E+00			
				SB + GW (MW30)	4.90E-06			1.70E+00			

TABLE RA-S2-15.CTE_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 5
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.5.CTE_0.8	Current/ Future	On-Site Utility Worker	5	Subsurface Soil	Ingestion	4.30E-07	NA	NA	1.90E-02	NA	NA
					Dermal	1.40E-07	NA	NA	2.10E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.40E-08	NA	NA	1.40E-01	NA	NA
						Subsurface Soil Total	5.90E-07		1.60E-01		
						GW, Trench (MW29)	Inhalation	--	NA	NA	1.90E-04
					GW - MW29 Total	--		1.90E-04			
				GW, Trench (MW30)	Inhalation	2.90E-08	NA	NA	8.90E-05	NA	NA
						GW - MW30 Total	2.90E-08		8.90E-05		
						SB + GW (MW29)	5.90E-07		1.60E-01		
					SB + GW (MW30)	6.20E-07		1.60E-01			

TABLE RA-S2-14B.CTE_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 4
 CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.4B.CTE_0.8	Current/ Future	On-Site Utility Worker	4	Subsurface Soil	Ingestion	3.00E-06	Aroclor 1260	2.10E-06	5.40E-01	NA	NA
					Dermal	1.10E-06	NA	NA	1.90E-01	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	8.10E-10	NA	NA	3.70E-03	NA	NA
				Subsurface Soil Total					4.10E-06		
No groundwater exposures, risks, hazards											

TABLE RA-S2-14.CTE_0.8

**RISK AND HAZARD SUMMARY
 UTILITY WORKER, OU2 EXPOSURE AREA 4
 CENTRAL TENDENCY EXPOSURE
 MATTHIESSEN AND HEGELER ZINC COMPANY SITE
 LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.4.CTE_0.8	Current/ Future	On-Site Utility Worker	4	Subsurface Soil	Ingestion	1.50E-06	NA	NA	2.50E-01	NA	NA
					Dermal	5.20E-07	NA	NA	8.90E-02	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.70E-10	NA	NA	1.50E-03	NA	NA
				Subsurface Soil Total					2.00E-06		
No groundwater exposures, risks, hazards											

TABLE RA-S2-13B.CTE_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 3
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard				
S7.2.3B.CTE_0.8	Current/ Future	On-Site Utility Worker	3	Subsurface Soil	Ingestion	8.10E-07	NA	NA	5.00E-02	NA	NA				
					Dermal	9.80E-08	NA	NA	3.20E-03	NA	NA				
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	2.00E-09	NA	NA	6.00E-04	NA	NA				
					Subsurface Soil Total	9.10E-07			5.30E-02						
				Groundwater	Ingestion	1.80E-10	NA	NA	5.60E-04	NA	NA				
				Groundwater	Dermal	2.70E-08	NA	NA	7.30E-03	NA	NA				
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA				
					Groundwater Total	2.70E-08			7.80E-03						
				SB + GW						9.30E-07			6.10E-02		

TABLE RA-S2-13.CTE_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 3
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.3.CTE_0.8	Current/ Future	On-Site Utility Worker	3	Subsurface Soil	Ingestion	1.30E-07	NA	NA	1.40E-02	NA	NA
					Dermal	1.70E-08	NA	NA	7.10E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	5.40E-10	NA	NA	1.90E-04	NA	NA
						Subsurface Soil Total	1.50E-07			1.40E-02	
				Groundwater	Ingestion	1.80E-10	NA	NA	5.60E-04	NA	NA
					Dermal	2.70E-08	NA	NA	7.30E-03	NA	NA
				Groundwater, Trench	Inhalation	--	NA	NA	--	NA	NA
						Groundwater Total	2.70E-08			7.80E-03	
					SB + GW	1.80E-07			1.80E-02		

TABLE RA-S2-12B.CTE_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.2B.CTE_0.8	Current/ Future	On-Site Utility Worker	2	Subsurface Soil	Ingestion	6.10E-07	NA	NA	5.30E-02	NA	NA
					Dermal	7.60E-08	NA	NA	2.80E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.20E-09	NA	NA	6.00E-04	NA	NA
				Subsurface Soil Total		6.90E-07			5.60E-02		
				Groundwater (MW15)	Ingestion	1.20E-08	NA	NA	3.60E-04	NA	NA
				Groundwater (MW15)	Dermal	5.40E-08	NA	NA	1.70E-03	NA	NA
				GW, Trench (MW15)	Inhalation	1.00E-09	NA	NA	--	NA	NA
				GW - MW15 Total		6.70E-08			2.10E-03		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	6.40E-10	NA	NA	2.40E-04	NA	NA
				GW - MW22 Total		6.40E-10			2.40E-04		
				SB + GW (MW15)		7.60E-07			5.80E-02		
				SB + GW (MW22)		6.90E-07			5.70E-02		

TABLE RA-S2-12.CTE_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 2
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGLER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.2.CTE_0.8	Current/ Future	On-Site Utility Worker	2	Subsurface Soil	Ingestion	9.20E-08	NA	NA	1.50E-02	NA	NA
					Dermal	1.20E-08	NA	NA	7.60E-04	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	4.50E-10	NA	NA	1.90E-04	NA	NA
					Subsurface Soil Total	1.00E-07			1.60E-02		
				Groundwater (MW15)	Ingestion	1.20E-08	NA	NA	3.60E-04	NA	NA
				Groundwater (MW15)	Dermal	5.40E-08	NA	NA	1.70E-03	NA	NA
				GW, Trench (MW15)	Inhalation	1.00E-09	NA	NA	--	NA	NA
					GW - MW15 Total	6.70E-08			2.10E-03		
				Groundwater (MW22)	Ingestion	--	NA	NA	--	NA	NA
				Groundwater (MW22)	Dermal	--	NA	NA	--	NA	NA
				GW, Trench (MW22)	Inhalation	6.40E-10	NA	NA	2.40E-04	NA	NA
					GW - MW22 Total	6.40E-10			2.40E-04		
					SB + GW (MW15)	1.70E-07			1.80E-02		
					SB + GW (MW22)	1.00E-07			1.60E-02		

TABLE RA-S2-11B.CTE_0.8

RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE – MAXIMUM CONCENTRATIONS
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard		
S7.2.1B.CTE_0.8	Current/ Future	On-Site Utility Worker	1	Subsurface Soil	Ingestion	8.00E-06	Arsenic Benzo(a)pyrene	4.9E-06 1.7E-06	7.70E-01	NA	NA		
					Dermal	1.90E-06	NA	NA	8.70E-02	NA	NA		
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation			4.10E-08	NA	NA	2.10E-01	NA	NA
						Subsurface Soil Total	1.00E-05			1.10E+00			
						GW, Trench (MW04)	Inhalation	7.70E-08	NA	NA	1.10E-03	NA	NA
					GW - MW4 Total	7.70E-08			1.10E-03				
				GW, Trench (MW31)	Inhalation			4.60E-10	NA	NA	7.20E-07	NA	NA
						GW - MW31 Total	4.60E-10			7.20E-07			
						SB + GW (MW04)	1.00E-05			1.10E+00			
					SB + GW (MW31)	1.00E-05			1.10E+00				

TABLE RA-S2-11.CTE_0.8

**RISK AND HAZARD SUMMARY
UTILITY WORKER, OU2 EXPOSURE AREA 1
CENTRAL TENDENCY EXPOSURE
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Table No.	Timeframe	Receptor	Exposure Area	Medium	Exposure Route	Exposure Route Total Risk	Risk Drivers	COPC-Specific Risk	Exposure Route Total Hazard	Hazard Drivers	COPC-Specific Hazard
S7.2.1.CTE_0.8	Current/ Future	On-Site Utility Worker	1	Subsurface Soil	Ingestion	5.20E-07	NA	NA	4.00E-02	NA	NA
					Dermal	1.10E-07	NA	NA	4.80E-03	NA	NA
				Outdoor Air Particulates and Vapors from Subsurface Soil	Inhalation	1.30E-09	NA	NA	1.30E-02	NA	NA
						Subsurface Soil Total	6.30E-07			5.80E-02	
				GW, Trench (MW04)	Inhalation	7.70E-08	NA	NA	1.60E-03	NA	NA
						GW - MW4 Total	7.70E-08			1.60E-03	
				GW, Trench (MW31)	Inhalation	4.60E-10	NA	NA	7.20E-07	NA	NA
						GW - MW31 Total	4.60E-10			7.20E-07	
					SB + GW (MW04)	7.10E-07			6.00E-02		
						SB + GW (MW31)	6.30E-08			5.80E-02	

TABLE RA-S2-56

**RISK AND HAZARD SUMMARY
OU2 OFF-SITE MIXED USE AREA (EA7)
MATTHIESSEN AND HEGELER ZINC COMPANY SITE
LASALLE, ILLINOIS**

Receptor	Conditions	Total Risk	Risk Drivers	Total Hazard	Hazard Drivers
Current/Future Child Recreationalist	RME	1E-06	All < 1E-06	NS	--
			Lead: No risk		
			Asbestos: No risk		
	CTE	NS	--	NS	--
Current/Future Adolescent Recreationalist	RME	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		
	CTE	NS	None	NS	--
Current/Future Adult Recreationalist	RME	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		
	CTE	NS	--	NS	--
			Lead: No risk		
			Asbestos: No risk		

Notes:

- Not identified
- CTE Central tendency exposure
- NS Not significant (risks < 10⁻⁶ and HI < 1)
- RME Reasonable maximum exposure

APPENDIX 2

Detailed Description of Alternatives carried through the Feasibility Study

OU1: Carus Plant Area

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0

Estimated Annual Operation and Maintenance (O&M) Cost: \$0

Estimated Present Worth Cost: \$0

Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 4 – EXCAVATION (WITH OFF-SITE DISPOSAL)

Estimated Capital Cost: \$5,621,150

Estimated Annual O&M Cost: \$ 10,000

Estimated Present Worth Cost: \$5,950,000

Estimated Construction Timeframe: 3-4 months

Soil would be excavated up to 4 feet in areas of the Carus Plant Area where soil concentrations are found above acceptable commercial/industrial human health risk levels. It is estimated that 24,200 cubic yards (cy) would be transported off site for disposal into an approved facility. The excavated areas would then be backfilled to an 18-inch thickness with approximately 18,000 cy of clean soil. The Gravel Paved Storage Area would be covered with a half-foot of clay. Asphalt would be placed over the rest of the excavated areas. Land use restrictions would be established, requiring that the land use of the Carus Plant Area is maintained as commercial/industrial.

Additional restrictions would require maintenance of the existing fencing and signage around the Carus Plant Area, and identification of the potential risks and hazards that exist. An Institutional Controls Monitoring Plan (ICMP) would be prepared for the site that details the land use restrictions. The ICMP would include a checklist of elements to be assessed during regularly scheduled on-site inspections. On-site inspections would review the fencing to ensure its integrity, verify warning signs are in place and intact, and ensure that any disturbance or removal of structures or existing pavement adheres to institutional controls (ICs). For cost estimating purposes, it is assumed that the IC inspections would be performed once per year for 30 years.

ALTERNATIVE 5 – LOW PERMEABILITY COVER

Estimated Capital Cost. \$1,184,300

Estimated Annual O&M Cost: \$ 10,000

Estimated Present Worth Cost: \$1,530,000

Estimated Construction Timeframe: 1 month

A low permeability cover will be placed in areas where the existing asphalt or concrete cover has been damaged or new cover is necessary to reduce potential direct exposure risks. The low permeability cover for Alternative 5 will be a non-porous pavement cover, which will be placed after subgrade excavation to acquire proper grade. As part of Alternative 5, the Gravel Paved Storage Area will have the accumulated soil and vegetation removed and disposed on site with

the slag at the Slag Pile Area. Following removal of the accumulated material, the base, side slopes, and top edges of the storage area will be lined with a minimum 1-foot-thick low permeability clay cover. No geotextile fabric will be placed between the clay and native material. The Gravel-Paved Storage Area cover will be covered by asphalt cover. The total asphalt area is approximately 4,100 square yards and the total compacted clay volume is approximately 1,400 cy. Land-use restrictions and property access restrictions will be implemented to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.

ALTERNATIVE 6 – SOIL COVER

Estimated Capital Cost: \$1,274,300

Estimated Annual O&M Cost: \$14,000

Estimated Present Worth Cost: \$1,620,000

Estimated Construction Timeframe: 1 month

This alternative will include excavating approximately 4,600 cy of contaminated soil across the plant, and then the installation of a soil cover to isolate impacted soil at the Carus Plant Area from commercial/industrial, utility, and construction workers. A gravel-paved storage area is located in the northeast portion of the Plant Area. As part of Alternative 6, accumulated soil and vegetation will be removed from the storage area and disposed of on-site with the slag at the Slag Pile Area. The quantity of accumulated material in the storage area is expected to be small and insignificant relative to the existing material currently present at the Slag Pile Area. The surface area soil cover for Alternative 6 will be 18 inches of clean compacted fill with an additional 6 inches of gravel placed after subgrade excavation to acquire proper grade. A gravel cover instead of a topsoil cover is required because the majority of the excavated and replaced materials are in areas that will have vehicular travel. Following removal of the accumulated material, the base, side slopes, and top edges of the storage area will then be lined with asphalt. Total asphalt placement in the storage area is assumed to be approximately 4,100 square yds. Land-use restrictions and property access restrictions will be implemented to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components.

OU1: Slag Pile Area (including Slope Stability)

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$0

Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 4 – EXCAVATION (WITH OFF-SITE DISPOSAL)

Estimated Capital Cost: \$213,576,000

Estimated Annual O&M Cost: \$16,000

Estimated Present Worth Cost: \$214,069,000

Estimated Construction Timeframe: 22 months

This alternative would include excavating roughly 1,200,000 cy of slag with concentrations above acceptable commercial/industrial human health risk levels and disposing of this material off site. Excavation would primarily be based on the visual extent of slag. Removal of all the soil/solid matrix material would also require replacement with compacted clean fill to an elevation above the river Probable Maximum Flood level, assumed to be approximately at elevation 475 feet above mean sea level, or at least 15 feet above river bottom. The volume of backfill is estimated at 615,000 cy. Land use restrictions and property access restrictions would be needed to ensure the land use remains commercial industrial. An ICMP would be created and would include a checklist of elements to be assessed during regularly-scheduled, on-site inspections. On-site inspections would review the fencing to ensure its integrity, verify warning signs are in place and intact, and ensure that any disturbance or removal of existing structures or pavement adheres to ICs. For cost estimating purposes, it is assumed that the IC inspections would be performed once per year for 30 years.

ALTERNATIVE 5 – LOW PERMEABILITY COVER

Estimated Capital Cost: \$6,756,000

Estimated Annual O&M Cost: \$16,000

Estimated Present Worth Cost: \$7,309,000

Estimated Construction Timeframe: 9 months

This alternative would include placing an engineered low-permeability cover to isolate impacted soil at the Slag Pile Area from commercial/industrial, utility, and construction workers. It is estimated that approximately 50,000 cy of material, at a thickness of 18 inches, will be placed under 6 inches of clayey topsoil. This alternative does not include the cut slope with benching and toe revetment components or the holding pond cut slope and reconstruction components. Although this alternative, without stabilization components, may not be practicable for the long term, it was included for purposes of comparison. This alternative also includes land-use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components. Periodic site reviews would be performed as part of this alternative to evaluate how the site conditions may have changed over time.

ALTERNATIVE 6 – SOIL COVER

Estimated Capital Cost: \$6,534,000

Estimated Annual O&M Cost: \$16,000

Estimated Present Worth Cost: \$7,087,000

Estimated Construction Timeframe: 9 months

This alternative would involve the covering of exposed soils to isolate impacted soil at the Slag Pile Area from commercial/industrial, utility, and construction workers. It is estimated that approximately 50,000 cy of engineered soil, at a thickness of 18 inches, would be placed on the slag pile. This alternative does not include the cut slope with benching and toe revetment components or the holding pond cut slope and reconstruction components. Although this alternative, without stabilization components, may not be practicable for the long term, it was

included for purposes of comparison. This alternative also includes land-use restrictions and property access restrictions to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components. Periodic site reviews would be performed as part of this alternative to evaluate how the site conditions may have changed over time. Regular cover maintenance would be required to ensure the long-term effectiveness of the remedy.

ALTERNATIVE 12 – EXCAVATION (WITH ON-SITE CONSOLIDATION ON OU2)

Estimated Capital Cost: \$101,083,000

Estimated Annual O&M Cost: \$16,000

Estimated Present Worth Cost: \$101,636,000

Estimated Construction Timeframe: 22 months

This alternative would include excavating roughly 1,200,000 cy of slag with concentrations above acceptable commercial/industrial human health risk levels and placing this material in an on-site consolidation area on OU2. Excavation would primarily be based on the visual extent of slag. Removal of all the soil/solid matrix material would also require replacement with compacted clean fill to an elevation above the river Probable Maximum Flood level, assumed to be approximately at elevation 475 feet above mean sea level, or at least 15 feet above river bottom. The volume of backfill is estimated at 615,000 cy. Land use restrictions and property access restrictions would be needed to ensure the land use remains commercial/industrial. An ICMP would be created and would include a checklist of elements to be assessed during regularly scheduled on-site inspections. On-site inspections would review the fencing to ensure its integrity, verify warning signs are in place and intact, and ensure that any disturbance or removal of existing structures or pavement adheres to ICs. For cost estimating purposes, it is assumed that the IC inspections would be performed once per year for 30 years.

The following alternatives would physically stabilize the slope of the slag pile and would reduce surface runoff and slope erosion. These alternatives may be implemented in conjunction with Alternatives 5 or 6 above.

ALTERNATIVE 14 – SLOPING AND BENCHING + REVETMENTS¹ AT THE TOE OF THE SLOPE + BEST MANAGEMENT PRACTICES (BMPs)

Estimated Capital Cost: \$17,479,000

Estimated Annual O&M Cost: \$14,000

Estimated Present Worth Cost: \$17,986,000

Estimated Construction Timeframe: 10 months

This alternative includes removal of the existing Slag Pile Area vegetation, and excavation, sloping, and benching of the slag pile along the Little Vermilion River (LVR). At a maximum, the excavation, sloping, and benching will result in a 1:2 vertical-to-horizontal slope with 5-foot wide benches at approximately 32-foot elevation intervals. A minimum 2-foot thick cover consisting of 6 inches of clayey topsoil over a minimum 18 inches of compacted soil or

¹ Revetments are structures that would provide erosion control armoring at the toe of the slope of the slag pile.

18 inches of compacted low permeability clay will be placed in a minimum of two compacted layers. The benches on the slope will be graded, draining surface flow to down-chutes to the LVR. The toe of slope along the river may include, if necessary, an 8-foot wide retained bench, which is 3 to 5 feet above the low river level. The toe of slope and top of bench, to an approximate elevation of 475 feet above mean sea level, would be protected with 18 inches of riprap over geotextile for river erosion protection. An exception to the 1:2 vertical-to-horizontal slope is the slope along the LVR near the holding pond located at the south end of OU1; the excavation and sloping along the LVR near the holding pond would be at a minimum 1:2.5 (vertical to horizontal). The 1:2.5 slope would also be used as the exterior slope for the east side (river side) berm of a modified and newly-constructed holding pond and National Pollutant Discharge Elimination System discharge point. The east side berm or top of the west side hill may also function as a haul route for delivery of soils and materials for OU1 and OU2 remedial action work. In that case, revised grading along the pond would be needed. BMPs will include soil cover seeding selected for growth over the soil-covered slag pile. Additional BMPs, both temporary and permanent, such as straw wattles, graded bench with check dams and rip-rapped down-chutes, and top of slope surface runoff control berms and graded surface swales would also be provided.

ALTERNATIVE 15 – SLOPING AND BENCHING + PLANTINGS + REVETMENTS AT THE TOE OF THE SLOPE + BMPs

Estimated Capital Cost: \$17,617,000

Estimated Annual O&M Cost: \$14,000

Estimated Present Worth Cost: \$18,124,000

Estimated Construction Timeframe: 10 months

This alternative includes remedial action components to prevent stormwater influx and slag erosion to the LVR. The alternative is identical to Alternative 14, as described above, with the addition of high density tree planting to further stabilize the slope. The two-foot cover would be sufficient to support the anticipated tree root depth.

OU2: Main Industrial Area

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$0

Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 2 – SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER

Estimated Capital Cost \$34,400,000

Estimated Annual O&M Cost: \$34,560 [Years 1-5]; \$24,100 [Years 6-30]

Estimated Present Worth Cost: \$34,800,000

Estimated Construction Timeframe: 26 months

Prior to excavation, demolition of subsurface structures and obstructions will need to be completed. Demolition debris, including concrete foundation, steel piping, etc., will need to be separated and classified for either on-site consolidation or off-site disposal. In addition, soil in the proposed on-site consolidation area will not be excavated, as the consolidation area will be constructed at the existing grade. The excavated material will be stockpiled in the Main Industrial Area and transferred into the consolidation area on a daily basis, once the consolidation area is fully prepared and ready to accept excavated soil. No soil will be transported off site for disposal as part of this alternative. Roughly 400,000 cy of contaminated material from the Main Industrial Area with concentrations above acceptable commercial/industrial human health risk levels would be excavated and placed into the consolidation area.

Excavated soil will be transported from each of the contributing areas and will be placed into a single consolidation area in the Main Industrial Area. It is anticipated that almost 950,000 cy of material will be placed into the consolidation area from the remedial action work at the site. When the contaminated soil has been consolidated, it will be covered with a soil cover. The FS assumed that the soil cover will consist of 2 feet of compacted clay with a hydraulic conductivity of $1E-07$ cm/s, followed by 1 foot of topsoil, which will restrict direct contact with contaminated soil. A permeable geotextile liner will be placed on top of the contaminated soil in order to demarcate the clean cover from the contaminated soil. Erosion mats will be installed along the top and slopes of the consolidation area to protect and stabilize the cover. A stormwater drainage system will be installed on each slope of the consolidation area and around the perimeter to drain water off of the consolidation area and into the existing LaSalle stormwater system. The stormwater drainage system will consist of 6-foot-wide swales, lined with erosion control mats and filled with a combination of 1 foot of stone bedding and 1 foot of riprap, and will lead to a stormwater control structure. Stormwater will then be transported approximately 1,000 feet to the existing LaSalle stormwater system and the LaSalle publicly owned treatment works. The consolidation area will then be seeded to minimize soil erosion and maintain cover stability. This area will be developed with a maximum side slope of 1:3 (vertical: horizontal) to minimize slope failure and possible soil erosion. Land-use restrictions and property access restrictions will be implemented to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components. An ICMP will be prepared for the Main Industrial Area that details the land use restrictions to be incorporated. The ICMP will include a checklist of elements to be assessed during regularly-scheduled, on-site inspections. Elements of the on-site inspections will include review of the fencing to confirm its integrity, verify that warning signs are in place and intact, that no structures or existing pavement have been disturbed or removed, and that the soil cover is intact and remains protective. For cost-estimating purposes, it is assumed that the IC site inspections will be performed once per year for 30 years.

ALTERNATIVE 3 – EX-SITU CHEMICAL STABILIZATION

Estimated Capital Cost: \$72,000,500

Estimated Annual O&M Cost: \$60,000 first year, none after first year

Estimated Present Worth Cost: \$72,586,000

Estimated Construction Timeframe: 33 months

This alternative includes remedial action components to stabilize contaminant concentrations in the soil that exceed acceptable commercial/industrial human health risk levels, and consists of four components: (1) excavation of contaminated soil and transportation to an on-site mixing basin or pugmill; (2) mixing chemical stabilizer with contaminated soil using clamshell excavators or pugmill; (3) transportation of stabilized soil back to original location for use as backfill; and (4) compaction and restoration of the site ground surface. Prior to stabilization, demolition of subsurface structures and obstructions will need to be completed. An excavator may be used to excavate the soil to a desired depth and load on-site haul trucks for transportation of contaminated soil to the desired mixing location. Approximately 400,000 cy of material would be treated by this alternative. Demolition debris, including concrete foundation, steel piping, etc., will need to be separated for off-site disposal. O&M will be primarily short term (less than 6 months) and consists of maintenance of the restored areas until vegetation is established. Land-use restrictions and property access restrictions will be implemented to ensure the land use remains commercial/industrial.

ALTERNATIVE 4 – SOIL EXCAVATION + EX-SITU TREATMENT BY SOIL WASHING

Estimated Capital Cost: \$181,948,500

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$182,001,000

Estimated Construction Timeframe: 70 months

This alternative includes remedial action components to treat contaminant concentrations in the soil that exceed acceptable commercial/industrial human health risk levels, and consists of six components: (1) excavation of contaminated soil; (2) transportation of excavated soil to the on-site soil-washing treatment location within the Main Industrial Area; (3) soil washing treatment, rinsing, and dewatering; (4) transportation of washed soil back to the original excavation location for use as backfill; (5) soil compaction and site ground surface restoration; and (6) transportation and disposal of washing wastewater and dewatered sludge. Under this alternative, the treated and dewatered soil will be transported back to the original excavation area for backfill, compaction, and surface restoration. Approximately 400,000 cy of contaminated material will be treated by this alternative. Demolition debris, including concrete foundation, steel piping, etc., will need to be separated for off-site disposal. O&M will be primarily short term (less than 6 months) and consists of maintenance of the restored areas until vegetation is established. Land-use restrictions and property access restrictions will be implemented to ensure the land use remains commercial/industrial.

ALTERNATIVE 5 – SOIL EXCAVATION + OFF-SITE DISPOSAL

Estimated Capital Cost: \$124,489,500

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$124,542,000

Estimated Construction Timeframe: 42 months

This alternative is relatively the same as Alternative 2 except that, under this alternative, the 400,000 cy of excavated soil that exceeds acceptable commercial/industrial human health risk levels will be transported off site for disposal instead of being placed within the on-site

consolidation area. Land-use restrictions and property access restrictions will be implemented to ensure the land use remains commercial/industrial. The excavated material will be temporarily stockpiled on OU2 and continuously loaded out to the off-site disposal facility. The soil stockpiles will be sampled in accordance with the off-site disposal facility requirements. Some soil from the Main Industrial Area will likely require disposal as a hazardous waste and/or as soil containing asbestos. After excavation, clean soil will be added to the excavation areas and compacted, and the surface will be restored.

OU 2 - North Area

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$0

Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 2 – ICS ONLY

Estimated Capital Cost: \$144,000

Estimated Annual O&M Cost: \$6,970

Estimated Present Worth Cost: \$283,000

Estimated Construction Timeframe: 1 month (no construction)

This alternative does not include remedial action components to contain or reduce contaminant concentrations in the soil. Instead, it controls potential risks and hazards from exposure to contaminated soil solely by implementing ICs. Annual site inspections and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) mandated five-year reviews (FYR) will be performed as part of this alternative to evaluate how site conditions may change over time. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of signage denoting the risks and hazards for the area.

ALTERNATIVE 3 - PHYTOREMEDIATION

Estimated Capital Cost: \$12,013,000

Estimated Annual O&M Cost: \$19,320 [Years 1-5]; \$13,270 [Years 6-30]

Estimated Present Worth Cost: \$12,152,000

Estimated Construction Timeframe: 1 month

This alternative would include the installation of plants in areas with contamination in shallow soils. For the purposes of the FS, the plants most likely to be used are the Chinese Brake Fern (CBF), *Pteris vittata*, which specializes in arsenic uptake, and Indian Mustard (IM), *Brassica juncea*, which specializes in lead uptake. A third plant to address polynuclear aromatic hydrocarbons (PAHs) in soil may need to be selected during the remedial design (RD) if neither CBF nor IM affects the PAHs during the bench and pilot tests. The actual plants to be used will be determined during the RD. The CBF and IM have been used in costing of the alternative. The

plants will require harvesting at the end of the growing season, with the harvested plants transported off site for disposal. The harvested plants may be classified as a non-hazardous waste for disposal. The proposed application of phytotechnology will address contamination using phytoaccumulation to remove contaminants from the soil and concentrate them in the plant, and to a lesser degree, phytostabilization to immobilize the contaminants and stabilize the soil matrix. Land-use restrictions and property access restrictions will be implemented to protect commercial/industrial, utility, and construction workers, to ensure the land use remains commercial/industrial, and to protect the constructed remedy components. The ICs will ensure that deeper contamination remains undisturbed and that the time needed to establish the plants is provided, and will reduce potential risks and hazards from exposure to contamination. Periodic site reviews would be performed as part of this alternative to evaluate how the site conditions may have changed over time.

ALTERNATIVE 4 – SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER

Estimated Capital Cost: \$14,900,000

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$14,900,000

Estimated Construction Timeframe: 7 months

For this alternative, approximately 170,000 cy of soil with concentrations above acceptable commercial/industrial human health risk levels will be excavated from the North Area and placed in the on-site consolidation area. The excavated material will be transferred to the consolidation area in the Main Industrial Area on a continuous basis. No soil will be transported off site for disposal as part of this alternative. Excavated areas will be backfilled and plantings will be established. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of signage denoting the risks and hazards for the area.

ALTERNATIVE 5 – SOIL EXCAVATION + OFF-SITE DISPOSAL

Estimated Capital Cost: \$34,800,000

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$34,800,000

Estimated Construction Timeframe: 7 months

This alternative is the same as Alternative 4 except that the 170,000 cy of excavated materials from the North Area that exceeds acceptable commercial/industrial human health risk levels would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.

OU 2 - Building 100 Area

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0

Estimated Annual O&M Cost: \$0
Estimated Present Worth Cost: \$0
Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 2 – ICS ONLY

Estimated Capital Cost: \$292,000
Estimated Annual O&M Cost: \$30,930
Estimated Present Worth Cost: \$431,000
Estimated Construction Timeframe: 1 month (no construction)

This alternative does not include remedial action components to contain or reduce contaminant concentrations in the soil. Instead, it controls potential risks and hazards from exposure to contaminated soil solely by implementing ICs. Annual site inspections and CERCLA mandated FYRs will be performed as part of this alternative to evaluate how site conditions may change over time. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of signage denoting the risks and hazards for the area.

ALTERNATIVE 3 – SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER

Estimated Capital Cost: \$3,200,000
Estimated Annual O&M Cost: \$0
Estimated Present Worth Cost: \$3,200,000
Estimated Construction Timeframe: 4 months

For this alternative, approximately 34,000 cy of soil with concentrations above acceptable commercial/industrial human health risk levels will be excavated from the Building 100 Area and placed in the on-site consolidation area. The excavated material will be transferred to the consolidation area in the Main Industrial Area on a continuous basis. No soil will be transported off site for disposal as part of this alternative. Excavated areas will be backfilled and plantings will be established. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of signage denoting the risks and hazards for the area.

ALTERNATIVE 4 – SOIL EXCAVATION + OFF-SITE DISPOSAL

Estimated Capital Cost: \$9,200,000
Estimated Annual O&M Cost: \$0
Estimated Present Worth Cost: \$9,200,000
Estimated Construction Timeframe: 5 months

This alternative is the same as Alternative 3 except that the 34,000 cy of excavated materials from the Building 100 Area that exceeds acceptable commercial/industrial human health risk levels would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.

OU2 - Rolling Mill Area

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$0

Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 2 – ICS ONLY

Estimated Capital Cost: \$330,000

Estimated Annual O&M Cost: \$6,970

Estimated Present Worth Cost: \$469,000

Estimated Construction Timeframe: 1 month (no construction)

This alternative does not include remedial action components to contain or reduce contaminant concentrations in the soil. Instead, it controls potential risks and hazards from exposure to contaminated soil solely by implementing ICs. Annual site inspections and CERCLA mandated FYRs will be performed as part of this alternative to evaluate how site conditions may change over time. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of signage denoting the risks and hazards for the area.

ALTERNATIVE 3 – SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER

Estimated Capital Cost: \$3,600,000

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$3,600,000

Estimated Construction Timeframe: 3 months

For this alternative, approximately 24,000 cy of soil with concentrations above acceptable commercial/industrial human health risk levels will be excavated from the Rolling Mill Area and placed within the on-site consolidation area. The excavated material will be transferred to the consolidation area in the Main Industrial Area on a continuous basis. No soil will be transported off site for disposal as part of this alternative. Excavated areas will be backfilled and plantings will be established. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of denoting the risks and hazards for the area.

ALTERNATIVE 4 – SOIL EXCAVATION + EX-SITU TREATMENT BY SOIL WASHING

Estimated Capital Cost: \$10,074,800

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$10,127,000
Estimated Construction Timeframe: 4 months

This alternative consists of six components: (1) excavating contaminated soil with concentrations above acceptable commercial/industrial human health risk levels; (2) transporting excavated soil from the Rolling Mill Area to an on-site soil-washing treatment location established within the Main Industrial Area; (3) soil-washing treatment, rinsing, and dewatering; (4) transporting washed and dewatered soil back to its original excavation location in the Rolling Mill Area for use as backfill; (5) compacting the soil and restoring the site ground surface; and (6) transporting and disposing of washing wastewater and dewatered sludge off site. It is assumed that a soil-washing system will be built onsite, in the Main Industrial Area. Roughly 24,000 cy of soil will be excavated from the Rolling Mill Area and transported to the Main Industrial Area for treatment and dewatering, then transported back to the original excavation location for use as backfill. This alternative includes land-use restrictions to ensure the land use remains commercial/industrial, along with other restrictions that would require installation and maintenance of signage denoting the risks and hazards for the area.

ALTERNATIVE 5 – SOIL EXCAVATION + OFF-SITE DISPOSAL

Estimated Capital Cost: \$7,300,000
Estimated Annual O&M Cost: \$0
Estimated Present Worth Cost: \$7,300,000
Estimated Construction Timeframe: 3 months

This alternative is the same as Alternative 3 except that the 24,000 cy of excavated materials from the Rolling Mill Area with concentrations above acceptable commercial/industrial human health risk levels would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.

OU2 - Off-Site Residential Area

ALTERNATIVE 1 – NO ACTION

Estimated Capital Cost: \$0
Estimated Annual O&M Cost: \$0
Estimated Present Worth Cost: \$0
Estimated Construction Timeframe: None

No action will be taken to mitigate risk.

ALTERNATIVE 2 – ON-SITE SOIL COVER

Estimated Capital Cost: \$104,894,000
Estimated Annual O&M Cost: \$1,678,800 [Years 1-5]; \$1,018,000 [Years 6-30]
Estimated Present Worth Cost: \$127,590,000
Estimated Construction Timeframe: 148 months

This alternative includes remedial action components to minimize direct contact with contaminants in the soil by placing a cover over contaminated soil. A visible barrier, such as orange construction fencing or landscaping fabric, is placed over the contaminated soil and beneath the soil cover. Residual contamination will be left in place and covered with a 12-inch-thick soil cover. ICs will be put in place to limit future land uses (to exclude gardens) and to protect the integrity of the soil cover. After installation of the soil cover, each yard will be restored as close as practicable to its pre-remedial condition.

ALTERNATIVE 3 – SOIL EXCAVATION + ON-SITE CONSOLIDATION UNDER A SOIL COVER

Estimated Capital Cost: \$112,147,700

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$112,925,000

Estimated Construction Timeframe: 177 months

This alternative includes excavating contaminated soils and transporting the soils to the Main Industrial Area for consolidation in the on-site consolidation area under a soil cover. In order to estimate the percentage of properties that are likely to require cleanup, the residential area was divided into four zones, based on the density of properties sampled during the remedial investigation (RI) and distance from the on-site areas of OU2. Based on sampling conducted during the RI, a total of approximately 3,000 properties are estimated to require cleanup. No soil will be transported off site for disposal as part of this alternative. For cost-estimating purposes, the maximum excavation depth at the off-site residential properties is estimated to be 24 inches. However, the final excavation depth may be less, based on pre-design sample results. It is estimated that close to 300,000 cy of material will be excavated from the residential area. The excavated material will be directly loaded into roll-off containers and transported to the Main Industrial Area for temporary stockpiling until the consolidation area is ready. If contamination remains in place deeper than 24 inches, a visual barrier, such as orange construction fence or landscape fabric, will be placed on top of the contaminated soil and beneath the clean backfill soil. The need for ICs will be evaluated on a property-by-property basis, depending on whether any contaminated soil remains in place at depth.

ALTERNATIVE 4 – SOIL EXCAVATION + OFF-SITE DISPOSAL

Estimated Capital Cost \$156,248,000

Estimated Annual O&M Cost: \$0

Estimated Present Worth Cost: \$157,025,000

Estimated Construction Timeframe 176 months

This alternative is the same as Alternative 3 except that the 300,000 cy of excavated materials from the residential area would be transported off site for disposal instead of being consolidated in the on-site consolidation area at the Main Industrial Area.

APPENDIX 3

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION**

**ADMINISTRATIVE RECORD
FOR THE
MATTHIESSEN & HEGELER ZINC SITE
LASALLE, LASALLE COUNTY, ILLINOIS**

**UPDATE 1
SEPTEMBER, 2015
SEMS ID:**

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
1	918855	10/1/88	U.S EPA	File	Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA	186
2	918873	12/1/89	U S EPA	File	Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual Part A Interim Final	291
3	146316	1/1/94	IEPA	File	CERCLA Integrated Site Assessment	117
4	174575	9/10/02	Benning, B., U S EPA	Muno, W., U.S. EPA	Enforcement Action Memorandum re. Determination of Threat to Public Health and the Environment at the LaSalle Rolling Mill Site <i>(Portions of this document have been redacted)</i>	14
5	918874	5/26/04	Carney, W , U.S. EPA	PRP List	Letter re Special Notice Letter for Matthiessen & Hegeler Zinc Company Site	6
6	922004	3/14/06	Collier, D., U S. EPA	Weeks, N., GeoSyntec Consultants	Letter re Approval of GeoSyntec Quality Management Plan (With Attachment)	2
7	263856	9/26/06	Karl, R., U.S EPA	Carus Corporation and Carus Chemical Company	Administrative Settlement Agreement & Order on Consent for RI/FS	82

8	922019	3/13/07	SulTRAC	U S EPA	Health and Safety Plan OU1 and OU2	20
9	922020	3/13/07	SulTRAC	U S. EPA	Data Management Plan OU1	5
10	922021	3/13/07	SulTRAC	U S EPA	Sampling and Analysis Plan OU1 (With Attachments)	206
11	922022	3/13/07	SulTRAC	U S. EPA	Site Management Plan OU1	5
12	922023	3/13/07	SulTRAC	U.S. EPA	Data Management Plan OU2	5
13	922024	3/13/07	SulTRAC	U S EPA	Site Management Plan OU2	5
14	922025	3/13/07	SulTRAC	U S. EPA	Sampling and Analysis Plan OU2 (With Attachments)	348
15	922011	11/14/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740161	2063
16	922012	11/14/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740248	1936
17	922014	11/16/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740355	1558
18	922013	11/20/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740269	1604
19	922015	11/21/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740363	2519
20	922016	12/3/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740512	2311
21	922017	12/4/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740633	115

22	922018	12/7/07	Patton, D., Columbia Analytical Services	Weeks, N., GeoSyntec Consultants	Analytical Test Report R2740697	510
23	922008	12/11/07	Patton, D , Columbia Analytical Services	Weeks, N , GeoSyntec Consultants	Analytical Test Report R2740626	3560
24	922007	12/17/07	McWhirter, L , TestAmerica Laboratories	Weeks, N., GeoSyntec Consultants	Analytical Report Revised	576
25	922009	1/4/08	Patton, D , Columbia Analytical Services	Weeks, N , GeoSyntec Consultants	Analytical Test Report R2741179	853
26	922010	1/10/08	Patton, D , Columbia Analytical Services	Fisher, T., GeoSyntec Consultants	Analytical Test Report R2741246	1378
27	918857	2/29/08	SulTRAC	U S EPA	Data Evaluation Summary Report	256
28	918866	8/14/08	SulTRAC	U.S EPA	Phase II Field Sampling Plan- Attachment A	340
29	918870	8/21/08	SulTRAC	U.S EPA	Phase II QAPP Attachment B	150
30	918861	9/12/08	Collier, D , U S. EPA	Weeks, N., GeoSyntec Consultants	Letter re. U.S. EPA Comments on Remedial Investigation/Feasibility Study Work Plan Addendum No 1 for Phase 2- OU1	9
31	918846	2/20/09	SulTRAC	U S. EPA	Technical Memorandum re. Year 1 Groundwater Sampling Review for Phase 1 Monitoring Wells- Revision 1	68
32	918868	3/4/09	Collier, D., U.S. EPA	Weeks, N., GeoSyntec Consultants	Letter re U.S. EPA Final Recommendations Relating to GeoSyntec's Response to Comments on the RI/FS Work Plan and FSP for Phase 2- OU1	3
33	918842	4/23/09	SulTRAC	U.S EPA	Phase II Sampling and Analysis Plan- Addendum	39
34	918854	4/30/09	SulTRAC	U.S EPA	Data Evaluation Summary Report Phase II	283

35	313752	5/27/09	Holz, T., U S EPA	Karl, R., U.S EPA	Action Memorandum re: Request to Conduct a Time-Critical Removal Action at the Matthiessen & Hegeler Zinc Site <i>(Portions of this document have been redacted)</i>	17
36	904129	6/12/09	Williams, T., IEPA	Collier, D., U S EPA	Letter re: Comments on Draft Technical Approach Consensus Document Human Health and Ecological Assessment Dated May 14, 2009	9
37	330723	6/16/09	Nachowicz, L., U.S. EPA	Carus, F , Peru, IL Resident	General Notice of Potential Liability	8
38	904136	7/14/09	Chapman, J., U S. EPA	Collier, D , U S. EPA	Memo re. Draft Comments on Technical Approach Consensus Document, Human Health and Ecological Risk Assessments	4
39	333840	7/14/09	Karl, R., U S. EPA	Carus, F., Peru, IL Resident	Unilateral Administrative Order-Docket No V-W- 09-C-932	20
40	918844	8/26/09	Knoepfle, J., Sullivan International Group, Inc.	Collier, D., U S EPA	Title Search Update (With Cover Letter)	157
41	918863	9/7/09	Knoepfle, J., SuLTRAC	Collier, D , U S. EPA	Letter re: Periodic Oversight Report for PRP RI/FS Ecological Soil Sampling and Aquatic Biological Community Assessment Field Activities August 10-13, 2009	52
42	918865	9/10/09	Knoepfle, J., SuLTRAC	Collier, D., U S. EPA	Letter re: Oversight Report PRP Phase 2 Remedial Investigation Field Activities- River Sampling for Toxicity Testing in Support of the BERA August 22-25, 2011	50
43	400877	10/2/09	Holz, T . U.S EPA	Graczyk, L.. and T Seilheimer, Weston Solutions	Letter Report re: Removal Action	87
44	918847	10/26/09	Webb, K., OSHA	Collier, D., U S EPA	Letter re. Safety and Health Hazards at Continental Metals. Inc	12

45	904131	1/21/10	Tolson, J , GeoSyntec	Collier, D , U S EPA	Letter re Statistical Approach for Calculating Exposure Point Concentrations- Human Health and Ecological Risk Assessments	3
46	922002	3/8/10	U.S. EPA	File	Technical Memo re: Proposed Approach for Developing Background Data Sets and Conducting Background Screening of Site Results	10
47	922003	3/9/10	U.S. EPA	File	Technical Memo re: Technical Approach to Calculating Preliminary Remediation Goals for Lead	10
48	918841	7/23/10	SulTRAC	U.S. EPA	Technical Memorandum No 1	107
49	918871	8/6/10	Collier, D , U S EPA	Knoepfle, J , Sullivan International Group, Inc , and N Weeks, GeoSyntec Consultants	Comments on the Remedial Investigation, Ecological Risk Assessment and Human Health Risk Assessment Reports	46
50	918872	8/31/10	Collier, D , U S. EPA	Knoepfle, J , Sullivan International Group, Inc , and N Weeks, GeoSyntec Consultants	Letter re Response to Comments on the Remedial Investigation, Ecological Risk Assessment and Human Health Risk Assessment Reports	84
51	903623	9/3/10	Collier, D . U.S EPA	Knoepfle, J.. Sullivan International Group, Inc., and N Weeks, GeoSyntec Consultants	Letter re Response to Comments on the Remedial Investigation, Ecological Risk Assessment and Human Health Risk Assessment Reports	89
52	918860	10/8/10	Collier, D . U S EPA	Kelly, K., Sullivan International Group, Inc., and N Weeks, GeoSyntec Consultants	Letter re Review of Response to Comments on the Remedial Investigation, Ecological Risk Assessment and Human Health Risk Assessment Reports	16

53	918850	11/15/10	Berggreen, R , and N Weeks, GeoSyntec Consultants	Collier, D , U.S. EPA	Letter re: Revised Draft Biological Assessment Report for the Little Vermilion River Adjacent to the Matthiessen and Hegeler Zinc Company Site	3
54	904195	2/25/11	Collier, D., U.S. EPA	Berggreen, R., Geosyntec Consultants	Letter re: U.S. EPA Comments on the Response to Comments- Draft Biological Assessment Report of the Little Vermilion River Adjacent to Matthiessen and Hegeler Zinc	9
55	918859	4/6/11	Knoepfle, J., Sullivan International Group, Inc.	Collier, D., U.S. EPA	Data Validation Report 2010 Background Soil Samples	142
56	904145	4/29/11	Berggreen, R., GeoSyntec	Collier, D., U S. EPA	Sediment Toxicity Testing Work Plan	25
57	904196	5/1/11	GeoSyntec	Carus Corporation and Carus Chemical Company	Biological Assessment of the Little Vermilion River Adjacent to Matthiessen and Hegeler Zinc Company Report	187
58	904194	8/12/11	Collier, D., U S EPA	Weeks, N., GeoSyntec Consultants	Letter re Approval of May 2011 Biological Assessment Report (BAR) of the Little Vermilion River Adjacent to Matthiessen and Hegeler Zinc Company Site	1
59	918864	9/14/11	Knoepfle, J., sulTRAC	Collier, D., U.S EPA	Letter re Oversight Report PRP Remedial Investigaiton Field Activities- Sediment Collection for Toxicity Testing in Support of the BERA August 22-25, 2011	34
60	918843	4/27/12	Collier, D., U S. EPA	Knoepfle, J., Sullivan International Group, Inc., and N Weeks, GeoSyntec Consultants	Letter re: Final Technical Review Comments "Draft Final Remedial Investigation Report"	6
61	900413	6/1/12	SulTRAC	U.S. EPA	Final Remedial Investigation Report Volume 1 of 6	625

62	904198	6/26/12	Collier, D , U S EPA	Knoepfle, J . Sullivan International Group, Inc , and N. Weeks, GeoSyntec Consultants	Letter re Approval of June 2012 "Final Remedial Investigation Report and Risk Assessment Appendices"	1
63	918845	8/24/12	Berggreen, R , Geosyntec Consultants and J. Knoepfle, sulTRAC	Collier, D , U.S EPA and M. Haggitt, IEPA	Technical Memorandum 2 re: Groundwater Classification	8
64	922001	9/12/12	GeoSyntec	U S EPA	Technical Memorandum 2 re: Groundwater Classification Addendum 1	6
65	918856	9/18/12	Haggitt, M., IEPA	Collier, D., U.S EPA	Letter re. Technical Memorandum 2 Groundwater Classification	2
66	918853	5/7/13	Knoepfle, J., Sullivan International Group, Inc	Collier, D , U S EPA	Letter re Suggestions for Resolution of Arsenic Remedial Action Level in Soil at Exposure Area 6	3
67	918849	8/23/13	Nierenberg, K., sulTRAC	Collier, D., U S. EPA	Letter re Analysis of Potential Lead Remedial Action Levels (RAL) for Soil in the Residential Area	46
68	918852	10/10/13	Nierenberg, K., sulTRAC	Collier, D., U S. EPA	Letter re: Ecological Risk Assessment for Northeast Area at Operable Unit 2 Matthiessen and Hegeler Zinc Company	6
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70	918869	2/26/14	Knoepfle, J , sulTRAC	Collier, D , U S EPA	Letter re: Response to EPA Comments on the Draft Feasibility Study Report Relating to OU2	13
71	918867	3/5/14	Earle, W., sulTRAC	Collier, D., U.S. EPA	Letter re QAPP Addendum- Additional Phase II Activities	57
72	918848	6/25/14	Tanaka, J., U.S. EPA	Smith, C , IEPA	Letter re Decision on Acceptable Risk Level for Residential Cleanup	2
73	918851	10/1/14	SulTRAC	U.S EPA	Final Feasibility Study	796

74	918858	10/23/14	Collier, D., U S EPA	Brockway, S , Sullivan International Group and N. Weeks, GeoSyntec Consultants	Letter re Approval of October 2014 Final Feasibility Study	1
75	918862	1/28/15	Collier, D., U S. EPA	File	Memorandum to File re: Matthiessen and Hegeler Zinc Company Superfund Site- North Area Future Anticipated Use	1
76	922032	9/1/15	U S. EPA	Public	Proposed Plan	96
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78	922006	No Date	U.S. EPA	File	Releasable Asbestos Field Sampler	1
79	922026	No Date	Ostrodka, S., U S EPA	Sullivan International Group	Review of Data- Case 36631	169
80	922027	No Date	Ostrodka, S , U S EPA	Sullivan International Group	Review of Data- Case 36648	168
81	922028	No Date	Ostrodka, S., U S EPA	Sullivan International Group	Review of Data- Case 36664	201
82	922029	No Date	Ostrodka, S , U S EPA	Sullivan International Group	Review of Data- Case- 36697	158
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U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR THE
MATTHIESSEN & HEGELER ZINC SITE
LASALLE, LASALLE COUNTY, ILLINOIS

UPDATE 2
NOVEMBER, 2015
SEMS ID:

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
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U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR THE
MATTHIESSEN & HEGELER ZINC SITE
LASALLE, LASALLE COUNTY, ILLINOIS

UPDATE 2
SEPTEMBER, 2016
SEMS ID:

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1	928419	10/20/15	Launius Reporting Service	U S. EPA	Transcript of Public Meeting for Proposed Soil Cleanup Plan <i>(Privacy information has been redacted)</i>	113
2	922282	11/1/15	U S EPA	Public	Fact Sheet- EPA Proposes Cleanup Plan at Former Zinc Smelter and Surrounding Homes	8
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7	928389	12/11/15	Private Citizen	Jones, T., U S EPA	Letter re: Carus Co. Cleanup in LaSalle, IL	2
8	928390	12/11/15	Hart, M. and M. Wilson, RPS GaiaTEch	Jones, T., U.S. EPA	Letter re: Comments to U.S. EPA's Proposed Cleanup Plan	17

9	928395	12/11/15	Dimond, T., Ice Miller LLP	Jones, T , U.S EPA	Letter re Comment of Carus Corporation on Proposed Plan	87
10	928387	12/12/15	Grove, J., City of LaSalle	Collier, D , and T. Jones, U.S. EPA	Letter re Official Comment Regarding Matthiessen and Hegeler Superfund Site and Related Matters	4
11	928393	12/20/15	Private Citizen	Jones, T., U.S EPA	Public Comment Sheet re. Proposed Cleanup Plan	6
12	928391	-	Private Citizen	Jones, T , U.S. EPA	Public Comment Sheet re: Proposed Cleanup Plan	5
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