Explanation of Significant Differences

Eagle Zinc Superfund Site

EPA ID: ILD980606941

Hillsboro, Illinois

U.S. Environmental Protection Agency

Region 5

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Executive Summary

The U.S. Environmental Protection Agency (EPA) is issuing a second Explanation of Significant Differences (ESD) to document interim changes that it is making to the selected remedy for Operable Unit (OU) 2 of the Eagle Zinc Superfund Site in Hillsboro, Illinois. These changes are needed because EPA had discovered lead-contaminated soil in a residential area while it was conducting remedial design sampling at OU 2 and had issued an ESD on June 22, 2016, to address this residential soil contamination. EPA had issued the 2016 ESD in anticipation that its national lead cleanup policy was going to be updated shortly afterwards; however, this has not occurred. Therefore, this ESD documents that EPA will conform with the current national lead policy when cleaning up the Eagle Zinc site.

In September 2012, EPA issued a Record of Decision (ROD) for OU 2 that called for cleaning up the residue piles and soil contamination at the site. To accomplish this, the residue piles will be consolidated and treated in-situ; all treated material, excavated soil and sediment, and stockpiled demolition materials from OU 1 will be consolidated and covered; an adjacent ephemeral stream will be realigned to reduce surface water interaction with the existing residue and to return the ephemeral stream to its natural flow pattern; institutional controls (ICs) will be placed on the property; and EPA will monitor groundwater and surface water quality.

EPA is making a change to the 2012 selected remedy, as modified by the 2016 ESD to establish a human health-based remedial action objective (RAO) for cleaning up residential soil and to excavate lead-contaminated soils from residential properties based on a site-specific cleanup level.

In addition, EPA is establishing a third OU for the 132-acre Eagle Zinc site. OU 1 addressed site contamination associated with the facility buildings and structures. OU 2 addresses contamination in soil, groundwater, surface water, and remaining manufacturing residues on site. OU2 had previously also included impacted sediment at and from the Site. However, because supplemental investigations have determined that impacted sediment in offsite streams and Lake Hillsboro will require additional evaluation through a Remedial Investigation for potential human health and ecological risks, offsite sediment remediation has been designated as OU3.

IEPA has indicated its support for this ESD.

Explanation of Significant Differences
Eagle Zinc Superfund Site

I. Introduction

A. Site Name and Location

The 132-acre Eagle Zinc Superfund Site (Site) is located on the northeastern side of Hillsboro, Illinois, which is about 50 miles south of Springfield, Illinois, in a mixed commercial/industrial area. The nearest residential area is approximately 100 feet southwest. The Site was used for zinc oxide production, zinc smelting, and related operations for about 90 years until activity ceased in 2003. Various abandoned facility buildings and associated residue piles cover approximately 30 acres of the Site and it also contains impacted wetlands.

EPA has now divided the Eagle Zinc site into three OUs: OU 1, which consisted of dilapidated and contaminated facility buildings; OU 2, which addresses contaminated soil, residue piles, on-site sediment, surface water and groundwater; and OU 3, which covers contaminated sediment within adjacent offsite streams and in nearby Lake Hillsboro.

B. Identification of Lead and Support Agencies

EPA is the lead agency for the Eagle Zinc site and IEPA is the support agency.

C. Statement of Purpose

This decision document sets forth the basis for issuing an ESD to the September 2012 ROD and the June 2016 ESD for OU 2 of the Eagle Zinc Superfund Site in Hillsboro, Illinois. Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establish procedures for explaining, documenting, and informing the public of significant changes to the remedy that occur after the ROD is signed. An ESD is required when the remedial action to be taken differs significantly from the remedy selected in the ROD but does not fundamentally alter the remedy with respect to scope, performance, or cost.

This ESD addresses lead-contaminated soil in a residential area discovered during remedial design sampling for OU 2. EPA had issued an ESD in 2016 to address the residential soil contamination, but the 2016 ESD anticipated that its national lead cleanup policy was going to be updated shortly afterwards, and would provide residential cleanup levels. Because this update has not occurred, EPA is issuing this ESD to document that the OU2 residential cleanup will conform with the current national lead policy.

D. Statutory Basis for Issuance of the ESD

This decision document sets forth the basis for the determination to issue an ESD to the September 2012 ROD, as modified by the 2016 ESD for OU 2 of the Eagle Zinc

Superfund Site. Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA)[1] and 40 Code of Federal Regulations (CFR) 300.435(c)(2)(i) and 300.825(a)(2) of the National Contingency Plan state that EPA shall write and publish an ESD when the remedy to be implemented differs significantly from the remedy selected in the ROD. EPA policy and regulations[2] indicate that an ESD, rather than a ROD Amendment, is appropriate where the changes being made to the RA are significant but do not fundamentally alter the overall remedy with respect to scope, performance, or cost.

E. Summary of Circumstances Necessitating this ESD

The circumstances necessitating this ESD involve the discovery of site-related soil contamination in a residential area. During the remedial action confirmatory sampling effort for OU 2, EPA identified several residential properties with elevated levels of lead in the soil. When EPA signed the 2012 ROD, existing data had shown that contamination was limited to within the plant site property boundaries; thus, the selected remedial action did not extend into the nearby residential area.

F. Agency Determination

EPA, in consultation with IEPA, has reviewed the changes to the Eagle Zinc site remedial action in accordance with CERCLA and EPA policy and guidance. EPA has determined that the changes to the OU 2 ROD are significant, but do not fundamentally alter the overall remedial action for the Site with respect to scope, performance, or cost. The modified remedy complies with the NCP and the statutory requirements of CERCLA and remains protective of human health and the environment. Thus, it is appropriate to issue an ESD to document the changes resulting in that modification.

G. Administrative Record

In accordance with Sections 300.435(c) and 300.825(a) (2) of the NCP, this ESD and supporting documentation will become part of the administrative record for the Site.

The administrative record is available for public review at the following locations:

EPA Region 5 Records Center
77 West Jackson Boulevard – 7th Floor
Chicago, IL 60604
8:00 a.m. - 4:00 p.m. M-F

Hillsboro Public Library
214 School Street
Hillsboro, IL 62049
9:30 a.m. – 5 p.m. M, F
9:30 a.m. – 7:30 p.m. T, W, Th
9:30 a.m. – 1:00 p.m. Sat.

[1] 42 United States Code (USC) §9617(c).
[2] See 40 CFR §300.435(c) (National Contingency Plan); EPA Office of Solid Waste and Emergency Response Directive 9355.3-02.

II. Site History, Contaminants, and Selected Remedy

A. Site History

The Eagle Zinc site was used for smelting and the manufacture of sulfuric acid, zinc oxide, and leaded zinc oxide from 1912 to 2003. Lanyon Zinc Company opened the first smelter facility in 1912, producing zinc and sulfuric acid. In 1919, Eagle-Picher Industries (Eagle-Picher) purchased the Site and continued to produce these products until 1935. During the early 1920s, Eagle-Picher also began manufacturing zinc oxide and leaded zinc oxide. These activities ceased around 1958. Eagle-Picher continued to manufacture zinc oxide at the Site until November 1980, at which time it sold the Site to the Sherwin-Williams Company (Sherwin-Williams). Sherwin-Williams continued zinc oxide manufacturing operations at the Site until the company sold the plant in 1984 to Eagle Zinc Company, a division of T.L. Diamond & Company (Eagle Zinc). Eagle Zinc continued manufacturing zinc oxide using the process employed by Sherwin-Williams and Eagle-Picher until it closed the plant in early 2003.

In 1981, while its facility was still in operation, Sherwin-Williams notified EPA that it had disposed of slag/residual materials ("residue") at the Site. IEPA then took surface water samples on Site and the results indicated that certain metals (zinc, iron, lead, and copper) exceeded state surface water quality standards. IEPA issued Sherwin-Williams a notice of violation, which resulted in Sherwin-Williams removing 18,000 tons of residue material from 10 acres of the Site. In 1984, IEPA conducted a preliminary site assessment and concluded that the soil samples collected in the early 1980s were not hazardous waste, and not subject to Resource Conservation and Recovery Act actions.

EPA conducted a remedial investigation (RI) at the Eagle Zinc site between 2001 and 2005, following an expanded site inspection and groundwater monitoring initiated by IEPA. EPA identified residue piles, soil areas, sediment, groundwater and surface water contamination that posed a potential threat to human health and the environment, and placed the Site on the National Priorities List in 2007.

B. Contaminants of Concern

Site records show that large amounts of zinc ore, smelter waste, and other similar materials were stored on the property during operations and that residue currently covers a significant portion of the Site. Approximately 210,000 cubic yards of residue is spread across the Site, with thickness ranging from a few inches to 28 feet. In addition, an estimated 43,500 cubic yards of residue is contained in 15 waste piles.

The residue and residue piles are the main sources of contamination at the Site. Residue that exceeded the industrial regional screening level (RSL) for soil covers approximately 56 acres. Total arsenic and lead were found above their RSLs in a large portion of the residue samples: 52% of the samples exceeded the RSL for arsenic and 40% exceeded the RSL for lead. Leachability tests were conducted using both SPLP and TCLP analyses, in order to identify the potential for metals to leach from the residue into groundwater and surface water. Table 1 presents the contaminants of concern and Site cleanup levels from the 2012 OU 2 ROD.

Table 1: Contaminants of Concern and Cleanup Levels for the Plant Site

Media	Contaminant	Cleanup Level (CL)	Basis for CLs
Residue/Soil	Lead	700 ppm	Illinois Tiered Approach to Corrective Action Objectives
	Zinc	61,000 ppm	
	Cobalt	12,000 ppm	
	Nickel	4,100 ppm	
	Antimony	82 ppm	
Surface Water	Cadmium	2.61 ppb	Illinois EPA General Use Surface Water Standards
	Zinc	62.8 ppm	
Sediment	Cadmium	1 ppb	Ecological Screening Levels
	Zinc	121 ppb	

C. Selected Remedy

To expedite cleanup, EPA initially split the Site into two OUs, with OU 1 addressing the facility buildings and OU 2 addressing the remaining contaminated media. EPA signed an interim ROD in 2009 to address contamination in and around the buildings by demolishing the buildings and mostly disposing of or recycling demolition material offsite. EPA completed this remedy in 2016.

Following a supplemental RI, EPA issued a 2012 ROD for OU 2 to address the residue piles and contaminated soil, groundwater, and sediment. On June 22, 2016, EPA signed an ESD modifying the Eagle Zinc Site OU2 remedy that included the addition of methods for sampling and determining the cleanup level for lead-contaminated soil in residential properties. The ESD also clarified hazardous waste treatment methods. The selected remedy for OU 2, as modified by the 2016 ESD, consists of the following:

Hazardous Waste Treatment: The residue piles will be consolidated and treated *in-situ* to meet SPLP treatment standards.

On-site Consolidation and Containment: All residue material above CLs, including the treated material, soils, excavated sediments, and stockpiled demolition materials from OU 1 and the lead-contaminated residential soils above residential CLs, will be consolidated and a cover compliant with 35 Illinois Administrative Code 807 will be installed.

Stream Re-alignment, Sediment Excavation, and Wetland: The westward flowing ephemeral stream will be realigned to reduce surface water interaction with the existing residue and to return the ephemeral stream to its natural flow pattern. Contaminated sediment above CLs will be excavated and consolidated under the soil cover.

Institutional Controls: A Restrictive Covenant was implemented on the property in November, 2011, and provides notice to future property owners that the contamination at the Site poses risks to human health and the environment. The Covenant restricts potable

use of groundwater and prevents disturbance of the remedy. The Covenant also prohibits residential use of the property, including homes, hospitals, and schools.

Monitoring and Assessment: Although there is some contamination in the on-site groundwater, the hydraulic conductivity is too low to produce sufficient water for potable use. EPA will monitor the groundwater and surface water quarterly; if conditions change, appropriate steps will be taken to address any unacceptable risk or impairment to beneficial use.

III. Basis for ESD

On June 22, 2016, EPA issued an ESD to the 2012 OU 2 ROD to address the lead-contaminated soil discovered in the residential area adjacent to the site and to make other clarifications. The 2016 ESD involved setting a lead CL for residential soil based on an approach that EPA anticipated was going to comply with an anticipated update to the national lead policy. However, the national lead policy is still being evaluated for potential updates, so the residential CLs described in the 2016 ESD were selected prematurely. This ESD is, therefore, being issued to address the lead contaminated soil in the residential area in a manner consistent with the current national lead policy.

The changes that EPA is making to the OU 2 remedy are summarized in Tables 2 and 3. Further descriptions of the changes are provided in the subsequent section. With these changes, the remedy will be protective and meet applicable or relevant and appropriate requirements (ARARs). Because hazardous waste will remain on-site at levels that do not allow for unrestricted use and unlimited exposure, five-year reviews will be required.

Table 2: ESD Changes to RAOs in OU 2 remedy

Media	**RAO(s) in 2012 OU2 ROD as modified by the 2016 ESD**	**ESD Change in RAOs**
Residue and Soil	• Prevent exposure to industrial and construction workers from COC concentrations in residue and soil immediately underlying the residue that exceed the cleanup levels (CLs). • Prevent residue erosion of COCs into the surrounding water bodies so that CLs are not exceeded in those water bodies or the sediment. • Reduce or eliminate lead exposure pathways in residential areas such that the probability of an individual child (aged 0 to 84 months) exceeding a blood lead level of 5 µg/dL is 5% or less. • Minimize leaching of COCs into the groundwater or perched water that discharges into surrounding water bodies	Replace the final soil RAO with: • Reduce or eliminate lead exposure pathways such that the probability of an individual child (aged 0 to 84 months) exceeding a blood lead level of 10 µg/dL is 5% or less. This calculates to a cleanup level of 400 mg/kg (or parts per million (ppm) for lead in soil.[1]

	in order to prevent unacceptable risk to aquatic receptors.	
Surface Water	• Minimize the discharge of COCs exceeding the CL into the surrounding water bodies	(No change)
Surface Water and Sediment	• Prevent unacceptable risk to the aquatic receptors from COCs that exceed the CL in surface water and/or sediment within a reasonable time frame	(No change)

[1] June 2012, National Toxicology Program Monograph on Health Effects of Low-level Lead https://ntp.niehs nih gov/pubhealth/hat/noms/lead/index html and Section 1 6 1 1, Children – Nervous System Effects 2013 ISA for Lead, http //cfpub epa gov/ncea/cfm/recordisplay cfm?deid=255721, CDC 2012, and CDC Advisory Committee on Childhood Lead Poisoning Prevention Low level lead exposure harms children a renewed call for primary prevention Available online at www cdc gov/nceh/lead/acclpp/final_document_030712 pdf

Table 3: ESD Changes to OU 2 Remedy

Remedial Component in 2012 OU2 ROD and 2016 ESD	ESD Remedy Change
On-site contaminated soil and sediment will be excavated, treated to meet SPLP standards, and managed in an on-site consolidation cell, along with lead-contaminated residential soil above the CL.	(No change)
On-site consolidation and containment.	(No change)
Stream Re-alignment, Sediment Excavation, and Wetland	Offsite sediments will instead be addressed in OU3.
Institutional Controls	(No change)
Monitoring and Assessment	(No change)

IV. Significant Differences from the OU 2 ROD Remedial Action

The selected remedy for OU 2 originally addressed only on-site soil contamination exceeding commercial/industrial CLs. However, data from confirmatory sampling and a supplemental investigation revealed that soil containing lead above the residential CL is present in a few residential yards and adjacent flood plain area of a stream that runs through the Site. The residential CL included in the 2016 ESD is being revised to reflect the current EPA policy.

A. Revision of Residential Soil RAO

The OU 2 remedial action confirmatory sampling and supplemental sampling efforts indicate that lead-contaminated soil is present on residential properties to the west of the Site. In order to address this contamination, this ESD amends the RAOs from the 2012 OU 2

ROD and the 2016 ESD to include an interim determination to reduce lead exposure pathways, at residential properties, such that the probability of an individual child's blood lead level exceeding 10 µg/dl is no more than 5%, which results in a soil lead cleanup level of 400 ppm. This cleanup level is considered interim until pending updates to the Integrated Exposure, Uptake, and Biokinetic (IEUBK) model default input parameters are finalized by EPA Headquarters. As EPA continues to review safe soil lead exposures, a final lead soil remediation goal will be selected in a final decision document.

B. Deferral of Offsite Sediment Remediation and Creation of OU3

Sediment sampling conducted since the 2012 ROD has identified site-related contaminants in offsite streams and in Lake Hillsboro that are at levels that will need further evaluation to determine potential human health and ecological risks. A Remedial Investigation and Feasibility Study (RI/FS) of offsite sediment is planned. The RI/FS may result in a ROD Amendment for offsite sediments. Current remedial work unrelated to offsite sediments will not be affected.

V. State Comments

Illinois EPA has reviewed this ESD and concurs with the significant change in remedy. The Concurrence letter will be added to the administrative record upon receipt.

VI. Statutory Determinations

EPA has determined that the adjustment of the residential cleanup action to the selected OU 2 remedy is necessary to be consistent with current EPA policy of lead cleanups. EPA has also determined that re-evaluation of offsite sediments as a new OU3 is appropriate in light of information indicating that the extent of contamination is greater than anticipated. EPA has determined that these changes, as documented in this ESD, are in accordance with CERCLA Section 121 and is protective of human health and the environment. As EPA continues to review safe soil lead exposures, a revised remediation goal may be developed that would be reflected in a final decision document. The change reflected in this ESD complies with federal and state requirements that are applicable and or relevant and appropriate, use permanent solutions to the maximum extent practicable, and is cost-effective. Since hazardous waste will remain on-Site at levels that do not allow for unrestricted use and unlimited exposure, five-year reviews of the remedy will be required.

VII. Public Participation Compliance

EPA shall publish a brief description of this ESD in the local newspaper as required by the NCP at 40 C.F.R. Section 300.435 (c)(2)(i)(B). This ESD will also be placed in the administrative record files and information repository which are located at the Hillsboro Public Library and in the EPA Region 5 office as required by the NCP Section 300.435(c)(2)(i)(A). (See Section I, paragraph F, of this ESD for further details about the information repositories.) An electronic copy of this ESD will be available online at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500648.

VIII. Declaration by EPA

EPA has determined that the modifications to the OU 2 ROD and the 2016 ESD for the Eagle Zinc Superfund Site documented in this ESD are significant, but do not fundamentally alter the overall site remedial action with respect to scope, performance, or cost. I therefore approve the issuance of this ESD for the Eagle Zinc site and the changes to the remedial action stated herein.

for Margaret Guerriero, Acting Director
Superfund Division
U.S. EPA Region 5

8/29/2019
Date

Figure 1: Site Map and Identification of Residential Areas for Further Investigation and Remediation