United States Environmental Protection Agency

Superfund Proposed Plan for Record of Decision Amendment
Koppers Co., Inc. (Charleston Plant) Superfund Site
Charleston, Charleston County, South Carolina
September 2017

INTRODUCTION

The Region 4 office of the U.S. Environmental Protection Agency (EPA) is issuing this Proposed Plan for a Record of Decision (ROD) Amendment at the Koppers Co., Inc. Superfund Site in Charleston, South Carolina (Figure 1). EPA is issuing this Proposed Plan as part of its public participation responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) for selecting a Remedial Action (RA). EPA is the lead agency for action at the site and the South Carolina Department of Health and Environmental Control (SCDHEC) is the support agency.

WHAT IS PROPOSED PLAN?

A Proposed Plan is a document to facilitate public involvement in a site's remedy selection process. The Proposed Plan is a document that the lead agency is required to issue to fulfill the requirements of CERCLA §117(a) and NCP §300.430(f)(2). A Proposed Plan presents EPA's preliminary recommendation on how to best address contamination at the site, describes the evaluated alternatives, and provides EPA's recommended Preferred Alternative.

EPA in consultation with SCDHEC, will select a final remedy for the Koppers Superfund site after all the information submitted during the 30-day public comment period is reviewed and considered. The proposed Preferred Alternative may be modified, or another remedial action presented in the plan may be selected based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan. The EPA's final decision will be documented in the Amended Record of Decision (ROD) with inclusion of a Responsiveness Summary

COMMUNITY INVOLVEMENT OPPORTUNITIES

30 DAY PUBLIC COMMENT PERIOD

DATES: September 18, 2017 – October 17, 2017
PURPOSE: To solicit comments on the Proposed Plan for Record of Decision Amendment

PUBLIC MEETING

DATE: September 28, 2017
TIME: 6:00pm
PLACE: Charleston Longshoremen's Association; 1142 Morrison Drive; Charleston, SC 29403
PURPOSE: To discuss details of the Proposed Plan for Record of Decision Amendment

EPA CONTACTS

Direct your written comments to:

Craig Zeller, EPA Remedial Project Manager at Zeller.Craig@epa.gov; or U.S. Mail to: USEPA Region 4, Superfund Division – 11th Floor, 61 Forsyth Street, SW, Atlanta, GA 30303.

Further questions, please contact:

L'Tonya Spencer, EPA Community Involvement Coordinator at Spencer.LaTonya@epa.gov, or 404.562.8463 (office).

addressing public comments.

This Proposed Plan summarizes information from the Remedial Action Work Plan (RAWP) and Technical Impracticability Waiver Demonstration (TIWD). These reports are available for review, and the public is invited to comment on the documents during a 30-day comment period. Site specific documents can be reviewed at the information repository located at the Charleston County Public Library, 68 Calhoun Street, Charleston, SC 29401.

This Proposed Plan identifies changes to the in-place remedies selected in the site-wide 1998 ROD, and as later modified by two Explanations of Significant Differences (ESDs) in 2001 and 2003. The Koppers Superfund Site is a key component of a larger 200+ acre assemblage that the City of Charleston has zoned for a mixed-use brownfield redevelopment project (known as Magnolia) including: commercial/retail use, office use, residential use, hotel use, and civic and park space. A consortium of developers plan to acquire and redevelop the majority of the 200+ acre assemblage, including the Koppers Superfund Site, provided the Koppers Superfund Site is eligible to participate in the South Carolina Brownfields/Voluntary Cleanup Program (Article 7 of the South Carolina Hazardous Waste Management Act). Sites in the South Carolina Voluntary Cleanup Program (VCP) are provided liability protection. However, National Priority List (NPL) sites are not eligible to participate in the South Carolina VCP (SC Code 44-56-730 (A)).

This Proposed Plan presents an amendment to the remedy that includes an estimated $30 Million in additional cleanup work on the Koppers site that will be implemented by the consortium of developers under the oversight of EPA. This additional cleanup work will allow the deletion of portions of the Koppers Site from the NPL, thus transforming this area of Charleston into a new mixed use community. The portion of the Koppers Superfund Site contemplated for de-listing from the NPL is depicted on Figure 2. The current remedy is appropriate for industrial and commercial use (subject to any vapor intrusion concerns associated with new construction). The proposed new remedy if implemented would allow for removal of the majority of the site from the NPL and allow residential uses at the site. The ROD Amendment is not intended to constitute a requirement that the proposed remedy be implemented but instead a formal recognition that if implemented the proposed remedy will allow for NPL deletion and for residential use.

Specifically, this Proposed Plan addresses:

1. A change in the remedy for creosote Non-Aqueous Phase Liquid (NAPL) and groundwater in the Old Impoundment Area (OIA) from active recovery to In-Situ Stabilization and Solidification (ISS) of the subsurface source material.
2. A more permanent soil exposure cover to support a change in land use from industrial to mixed use, with a residential component;
3. Replacement of existing drainage ditches with a subterranean storm sewer system consistent with future use; and
4. A technical justification for waiving compliance with groundwater cleanup levels (based on Safe Drinking Water Act Maximum Contaminant Levels or MCLs) for benzene and benzo(a)pyrene that were identified in the 1998 ROD. Two separate Technical Impracticability waiver zones (TI zones) for the NW Corner (1 acre) and OIA (4.5 acres) are illustrated on Figure 3.

SITE BACKGROUND

The 102-acre Koppers Site is located in the "neck" area of Charleston, SC amid industrial, commercial and residential properties. From 1940 to 1978, Koppers operated a wood treating facility on an approximate 45-acre parcel generally bounded by Milford Street on the north, Braswell Street on the south, the Ashley River on the west, and the King Street Extension on the east. The remaining 57-acre portion of the site, located south of Braswell Street, was owned by Ashepoo Phosphate/Fertilizer Works. EPA incorporated these 57-acres into the Koppers Site boundary to investigate historical waste disposal practices and environmental impacts.

The wood treating operations consisted primarily of treating raw lumber, utility poles and cross-ties with creosote. For short periods of time, pentachlorophenol and copper chromium arsenate

were also used as preservatives in the wood-treating process. Wood treating operations were conducted in the eastern portion of the site, known as the Former Treatment Area (FTA). The site was drained by three ditches leading towards the Ashley River, one of which discharged to a low lying area designated as the OIA. (See Figure 2).

The site was proposed to the NPL in 1992 and was finalized on the NPL in December 1994. Beazer East, Inc., the potentially responsible party (PRP), entered into an Administrative Order on Consent (AOC) with EPA in January 1993 to conduct a Remedial Investigation/Feasibility Study (RI/FS). In 1995, EPA issued an interim cleanup plan to address the migration of creosote north of Milford Street, and to eliminate exposure to creosote that was present in the Milford Street and Hagood Avenue drainage ditches. EPA issued the site-wide ROD in April 1998. An ESD was issued in 2001 that changed the Ashley River remedy from enhanced sedimentation to installation of a protective cap. A 2003 ESD changed the Barge Canal remedy from capping, to natural sedimentation; and changed the NW Corner remedy from active groundwater/creosote NAPL recovery to subsurface In-Situ Stabilization and Solidification. Active cleanup and remediation activities were conducted from 1999-2003.

The site-wide cleanup remedy was completed in September 2003, and generally consisted of the following components:

- Excavation of 22,000 tons of soil and off-site disposal at the Pinewood, SC landfill;
- Placement of a 40 acre engineered soil cover;
- Reconstruction of 3,600 linear feet of drainage ditches;
- Excavation and restoration of the North and South tidal marshes;
- Installation of a 3-acre cap in the Ashley River;
- Monitored Natural Recovery for the Barge Canal;
- In-situ solidification/stabilization at the NW Corner; and
- Recovery of groundwater and creosote NAPL at the FTA and OIA.

The net present value of the remedy completed in 2003 was approximately $20.4 Million. O&M continues at the FTA and OIA at an estimated cost of $200,000 per year.

Since October 2003, active groundwater and creosote NAPL recovery from the subsurface has occurred at two areas on site, the FTA and OIA. As of 2016, an estimated 20,600 gallons and 13,400 gallons of creosote NAPL has been recovered from the FTA and OIA, respectively.

EPA has completed three Five-Year Review Reports in 2003, 2008 and 2013 regarding the effectiveness of the completed and on-going remediation work.

SCOPE AND ROLE OF THE ACTION

This Proposed Plan will lead to an Amendment to the 1998 ROD. In accordance with that decision document, a remedy protective of human health and the environment for industrial use has been implemented and maintained. To facilitate the proposed redevelopment, the overall Magnolia project property has been rezoned by the City of Charleston from industrial to mixed-use, with a residential component. For redevelopment to occur, changes to elements of the in-place remedy are necessary to allow for the proposed mixed use on the site. The proposed changes in remedy focus on two main components of the remedy implemented in accordance with the 1998 ROD: 1) a change in the NAPL/Groundwater remedy for the OIA; and 2) a change in remedy for site-wide soils. Also, existing storm water ditches will be replaced with storm water conveyance piping, or alternatively will be filled and relocated.

In addition to modifications to the remedy, a waiver of MCLs identified as chemical-specific applicable or relevant and appropriate requirements (ARARs) under CERCLA §121(d)(4) based upon a demonstration of Technical Impracticability for groundwater restoration will be granted for two areas of the site: 1) a one-acre area of the NW Corner; and 2) a 4.5-acre area of the OIA. A technical justification for an ARAR waiver for benzene and benzo(a)pyrene in groundwater has been developed in the TIWD.

SUMMARY OF SITE RISKS

Wood-treatment compounds, primarily creosote, were identified as constituents of concern (COCs) in the previous risk assessments completed as part of the Remedial Investigation. The COCs identified as indicator chemicals for soil impacts in the 1998 ROD included benzo(a)pyrene toxicity equivalents (BAP TEQs), arsenic, lead, pentachlorophenol, and dioxins/furans. In NAPL and groundwater, COCs include creosote-related Volatile Organic Compounds (VOCs) and Semi-Volatile Compounds (SVOCs). NAPL is considered a principal threat waste under EPA guidance and there is an expectation in the NCP to treat such waste wherever practicable [40 CFR 300.430(a)(1)(iii)].

Contaminated soils on site were previously remediated to achieve cleanup goals protective of industrial workers. During ROD implementation, the most contaminated soils were excavated and transported off-site for disposal at an approved landfill. Approximately 40 acres of the site was then capped with an engineered soil cover to reduce the future potential for soil exposures.

To support redevelopment of the property for residential use, an evaluation of potentially complete soil exposure pathways and associated risks was completed. Exposure assumptions used for the soil risk evaluation were based on current EPA default assumptions for residents and site workers that might be involved in construction activities at the site. Current risk assessment guidance was followed in the calculations of exposure intakes, assessment of toxicity, and characterization of direct soil contact risks. The updated risk evaluation indicated no adverse risks or hazards for future construction or utility workers exposed to soil. Modifications and enhancements to the existing soil cover will be incorporated into redevelopment of the site that will be protective of future residential receptors. These enhancements include the placement of one or more feet of clean soil cap during the site re-grading work. Placement of one foot or greater of clean soil will prevent direct exposure to potentially impacted surface soils under the residential soil scenario and ensure protection of human health and the environment.

A creosote NAPL product removal remedy has been active since October 2003 in the OIA. The extraction well system has recovered more than 13,000 gallons of creosote NAPL. This remedy will be replaced with In-Situ Stabilization/Solidification (ISS) to stabilize and bind the residual NAPL in the subsurface. ISS is a proven technology which has already been successfully implemented within the NW Corner (Figure 2) of the site. Drinking water in this area is provided by the local municipalities. Direct groundwater exposure pathways are currently incomplete and are expected to remain incomplete in the future due to institutional controls.

EPA'S PREFERRED ALTERNATIVE

Remedy selection under Superfund requires that each cleanup alternative be evaluated by nine criteria. The purpose of this analysis is to identify relative advantages and disadvantages of each alternative. For this evaluation, the nine criteria identified in the NCP were used to evaluate two cleanup alternatives: 1) the "No Further Action" alternative (no additional cleanup); and 2) ISS in the subsurface of the OIA with additional soil capping (to allow for deletion from the NPL).

A detailed evaluation of the remedy evaluation criteria was conducted in the RAWP and TIWD. Table 1 provides a summary of that analysis and comparison of the above two alternatives. The comparison clearly shows that the additional $30 Million in cleanup work provides more protection than the existing, in-place remedies. ISS in the OIA provides effective long-term source control that will not require lengthy operation and maintenance work. The additional cap and hard-scape under a future mixed use redevelopment provides more permanence, effectiveness and long-term environmental stewardship. Permanent storm water infrastructure will also replace current open drainage ditches that require frequent maintenance. Moreover, this Proposed Plan is consistent with EPA's stated priority in the Superfund Task Force Recommendations of leveraging private funds to promote additional cleanup that leads to removal from the NPL and economic redevelopment of Superfund sites. For these reasons, EPA has proposed the cleanup alternatives described below.

NAPL/Groundwater Remedy

To achieve long-term source control that will allow for NPL deletion of this area of the site, In Situ Solidification/Stabilization (ISS) will be conducted on the residual creosote NAPL remaining in the subsurface of the OIA. The primary objectives of ISS are: 1) a reduction in permeability, 2) elimination or reduction of NAPL via solidification, and 3) a reduction in contaminant leaching to groundwater.

ISS in the OIA will be accomplished via two general soil mixing techniques. For the shallow zone (less than 15 feet below surface), the slurry recipe will be delivered by a rotary blender. A large diameter auger will be used to mix and homogenize the deeper treatment zones. The ISS slurry recipe will be designed to meet treatment goals for unconfined compressive strength and permeability (hydraulic conductivity). Up to 55,000 cubic yards of material in the subsurface of the OIA will be treated via the ISS technology. The area to be treated is approximately 1.5 acres, and will extend up to 35 feet below surface.

Under the NCP, a remedial alternative that does not meet an ARAR may be selected when EPA determines that compliance with the requirement is technically impracticable from an engineering perspective [40 CFR 300.430(f)(1)(ii)(C)]. The applicability of a Technical Impractability (TI) waiver for restoration of groundwater to attain chemical-specific ARARs at the OIA and NW Corner areas of the site was evaluated relative to three criteria categories specified in the EPA Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration (EPA, 1993): hydrogeologic factors, contaminant-related factors, and technological factors. This guidance document outlines EPA's approach to evaluating the technical impracticability of attaining required groundwater cleanup levels and establishing alternative protective remedial strategies where restoration is determined to be technically impracticable.

In situations where groundwater restoration is unattainable from an engineering perspective, a TI waiver is an important part of the remedy selection process. The details of the TI waiver process for the Koppers site can be found in the TIWD. The TI waiver demonstration employed a groundwater model, calibrated with site-specific aquifer characteristics, to evaluate the time required to attain drinking water standards (MCLs) in the groundwater for benzene and benzo(a)pyrene (identified as chemical-specific ARARs in the ROD). The TI evaluation determined that regardless of the remediation approach employed (ISS source control or "status quo"), a limited halo of benzene groundwater contamination exists 20 to 100 feet downgradient of the NAPL source area for 80 to 100 years. Based on the lengthy groundwater restoration time frame, EPA has determined that a TI waiver is justified based upon the site-specific evaluation and as a result established a 4.5-acre TI zone for the OIA, and a one-acre TI zone for the NW Corner where the drinking water ARARs will be waived. (See Figure 3). The total 5.5-acre TI zone area represents about 5% of the 102-acre Koppers site. Compliance with the MCLs for benzene and benzo(a)pyrene as part of the groundwater restoration remedy is therefore not required in these TI zones. However, consistent with EPA guidance, the amended remedy (including the TI waiver) will prevent further migration of the plume(s) and prevent exposure to contaminated groundwater [*Clarification of OSWERs 1995 Technical Impracticability Waiver Policy*, EPA OSWER Dir. 9355.5-32, Sept. 19, 2011].

Institutional controls will also be implemented on the property to prohibit the use of groundwater underlying the site to prevent unacceptable exposure.

Soil Remedy

The remedy selected in the 1998 ROD for the soils was the excavation and subsequent capping of soils and drainage ditch sediments in designated portions of the site. The soil remedy, excavation and placement of engineered soil covers is adequately protective for future on-site workers (surface soil) and future utility workers (subsurface soil) under an industrial land use scenario. Based on the results of the revised risk evaluation, modifications to the in-place soil cover remedy are necessary to accommodate residential use at the site. To allow for mixed use development, a minimum 12 inch thick

clean soil layer will be placed over applicable portions of the site as an engineering control to prevent exposure to residential receptors. The primary objective of the soil cover is to prevent direct contact with surface soil contaminants with concentrations in excess of residential cleanup goals. Additionally, institutional controls will be placed on the property to prevent exposure to soils underneath the cap material.

Based on information currently available, EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. EPA expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element.

Because this remedy will result in hazardous substances and contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years after the initiation of the remedial action, and every 5 years thereafter until the levels of COCs allow for unrestricted use of soil and groundwater with unlimited exposure to these media. The five-year reviews will be conducted to ensure that the remedy is, or will be, protective of human health and the environment. If results of the five-year reviews reveal that remedy integrity is compromised and protective of human health/environment is insufficient, then additional remedial actions will be evaluated by EPA and SCDHEC. The statutory five-year reviews will be conducted in accordance with CERCLA §121(c) and the NCP requirement 40 CFR 300.430(f)(4)(ii).

COMMUNITY PARTICIPATION

EPA encourages the public to provide comments on the Proposed Plan during the 30-day public comment period which begins on September 18th and extends through October 17, 2017. Documents supporting this Proposed Plan can be found on line at: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0403350&msspp=med. Site specific documents can be reviewed at the information repository located at the Charleston County Public Library, 68 Calhoun Street, Charleston, SC 29401.

Upon timely request, EPA will extend the comment period for an additional 30 days. Comments may be emailed to: Zeller.Craig@epa.gov. Hard copies may be sent via U.S. Mail, to Craig Zeller, US EPA Region 4, Superfund Division – 11th Floor, 61 Forsyth Street, SW, Atlanta, GA 30303.

PUBLIC MEETING

EPA will host a public meeting on Thursday, September 28, 2017, at 6:00pm at the Charleston Longshoremen's Association facility located at 1142 Morrison Drive. Representatives from EPA will present the rationale behind the Proposed Plan for the Koppers site, and answer any questions the public may have regarding the future cleanup plans. Please plan to attend.

FOR FURTHER INFORMATION ON THE KOPPERS SUPERFUND SITE:

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NCP EVALUATION CRITERIA

Threshold Criteria

- Overall Protection of Human Health and Environment – Assessment of the degree to which the cleanup alternative eliminates, reduces, or controls threats to public health and the environment.
- Compliance with ARARs – An evaluation of whether or not the alternative complies with identified federal and more stringent state environmental laws or regulations, or provides a justification for a waiver under CERCLA §121(d)(4).

Primary Balancing Criteria

- Long-term Effectiveness and Permanence – The cleanup alternative is evaluated in terms of its ability to maintain reliable protection of human health and the environment over time once the cleanup goals have been met.
- Reduction of Toxicity, Mobility, or Volume – An evaluation of how well a cleanup alternative reduces the harmful nature of the chemicals; the ability of the chemicals to move from the site into the surrounding area; and the amount of contaminated material.
- Short-term Effectiveness – The length of time needed to implement a cleanup alternative is considered. This criteria also assesses the risks that carrying out the cleanup alternative may pose to workers and nearby residents.
- Implementability – An assessment of how difficult the clean up alternative will be to construct and operate, and whether the technology is readily available.
- Cost – A comparison of the costs of each alternative. Includes capital, operations, and maintenance costs.

Modifying Criteria

- State Acceptance – USEPA takes into account whether or not the state agrees with the recommended alternative and considers comments from the state on the RI/FS Reports and Proposed Plan.
- Community Acceptance– USEPA considers the comments of local residents on the recommended alternative presented in the Proposed Plan and RI/FS Reports.

TABLE 1
FORMER KOPPERS SUPERFUND SITE NCP COMPARISON SUMMARY

DESCRIPTION	NAPL/Groundwater in Old Impoundment Area (OIA)		Onsite Soils	
	Existing O1 Continue Product Recovery System	**Proposed O2 In-situ Stabilization/ Solidification of Mobile NAPL**	**Existing C1 No Action (Maintain existing engineered soil cover system)**	**Proposed C2 Surficial Soil Capping**
Description	Maintain the current four extraction wells and groundwater monitoring system.	Solidify/stabilize mobile NAPL through the addition of physical stabilizing/solidification agents to immobilize contaminants within the soil matrix; suspend NAPL extraction and groundwater recovery.	Maintain the current soil cover for a mixed use (with residential component) development	Installation of 12 inch clean soil cover over soils with COCs above remedial goals, maintenance of applicable engineering and/or institutional controls
1. Overall Protection of Human Health and Environment	Reduces mass and volume of NAPL - technically impracticable to meet clean-up goals for restoration of groundwater below MCLs. Protective of human health and environment. Removes source, controls migration to prevent exposure to human health.	Immobilizes NAPL thus mitigating exposure and continued leaching – technically impracticable to meet cleanup goals for restoration of groundwater below MCLs. Protective of human health and environment. Isolates and prevents source exposure to human health.	Unacceptable risk to human health would not be mitigated.	Protective of receptors. Blocks transport and exposure pathways.

TABLE 1
FORMER KOPPERS SUPERFUND SITE NCP COMPARISON SUMMARY

DESCRIPTION	NAPL/Groundwater in Old Impoundment Area (OIA)		Onsite Soils	
	Existing O1 Continue Product Recovery System	**Proposed O2 In-situ Stabilization/ Solidification of Mobile NAPL**	**Existing C1 No Action (Maintain existing engineered soil cover system)**	**Proposed C2 Surficial Soil Capping**
2. Compliance with ARARs	Complies with applicable Federal and State, environmental regulations including MCL ARAR for benzene and benzo(a)pyrene.	Complies with applicable Federal and State environmental regulations but waiver of MCL ARAR for benzene and benzo(a)pyrene is justified based on TI.	Does not comply with ARARs.	Complies with applicable Federal and State environmental and public health standards, regulations, guidance, advisories, and ordinances.
3. Reduce Toxicity, Mobility, or Volume Through Treatment	Reduces mass and volume of NAPL over long period. Not as effective in reducing mobility as other alternative.	Immobilizes NAPL thus preventing mobility. Mass and volume are bound into a soil/cement matrix preventing exposure and leachability.	No change in mobility, toxicity or volume of COCs	No change in mobility, toxicity or volume of COCs
4. Short-term Effectiveness	Limited short term impact.	Effective short term. Immediately effective in blocking exposure pathway. Risks to construction workers/public during solidification process are manageable through best management practices.	Not Effective	Effective short term, immediately effective in blocking exposure pathway. Risks to construction workers /public during remedial action are manageable through best management practices.
5. Long-term Effectiveness	Effective once clean-up goals are met. Demonstrated to be technically impracticable to meet clean up goals.	Effectively immobilizes NAPL thereby preventing migration and minimizing an ongoing source of groundwater contamination.	Not Effective	OM&M required to maintain long term effectiveness.
6. Implementability	Implementable, straightforward, reliable technology.	Demonstrated to be implementable in NW Corner area. Proven technology implemented at many creosote NAPL sites.	Not Applicable	Straightforward, reliable technology.
7. Cost	$1,237,000	$6,003,000	Not Applicable	$11,698,000
8. State Acceptance	Acceptable to State.	Acceptable to State. .	Not Applicable	Acceptable to State.
9. Community Acceptance	Acceptable to Community	TBD after Comment Period	Acceptable to Community	TBD after Comment Period

ARAR = Applicable or Relevant and Appropriate Requirement
COCs = Constituents of Concern
ICs/ECs = Institutional Controls/Engineering Controls
OM&M = Operation Maintenance and Monitoring

Figure 1
Koppers Superfund Site

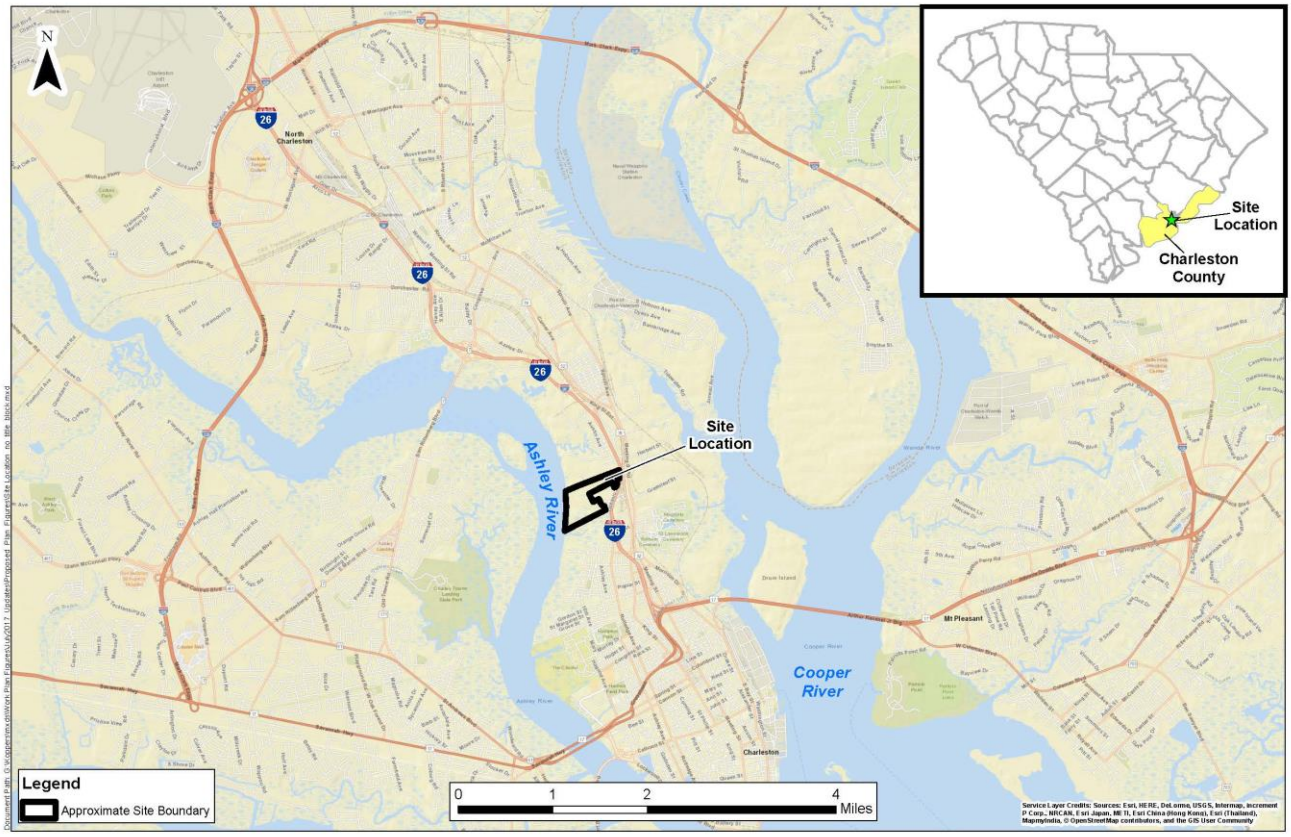

Figure 2
NPL Deletion Property

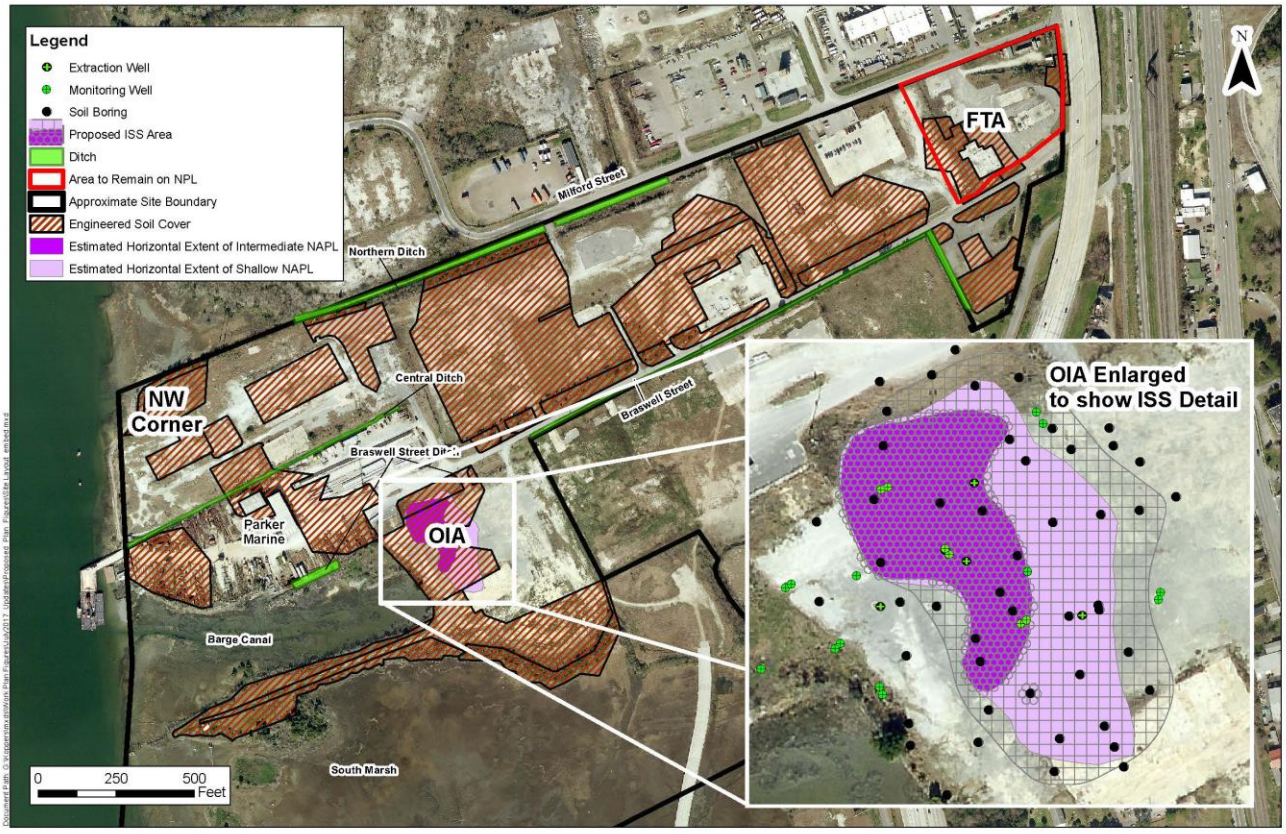

Figure 3
TI Waiver Zones