REDACTED

RECORD OF DECISION (ROD) AMENDMENT

Former Koppers Company Superfund Site
Charleston, Charleston County, South Carolina

United States Environmental Protection Agency Region 4
Superfund Division
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

February 2018

DECLARATION

Site Name and Location

The Former Koppers Superfund Site (Charleston Plant) is a National Priorities List (NPL) Site located in Charleston, Charleston County, South Carolina (the "Site"). Approximate boundaries of the Site are shown on Figure 1-1. The National Superfund Database Identification Number is SCD980310239. This Record of Decision (ROD) Amendment addresses remedy modifications that if implemented in accordance with the ROD Amendment will support commencement of the process for a partial deletion of the Site from the NPL by the EPA in accordance with the NCP at 40 C.F.R. 300.425(e), which will include all of the Site except for a 3.9 acre portion of the Site identified on Figure 1-2. The portion of the Site to be eligible for deletion pursuant to the preceding sentence will be referred to herein as the "NPL Deletion Eligible Property".

Statement of Basis and Purpose

This decision document presents the Selected Remedy for the Koppers Superfund Site, in northern Charleston, Charleston County, South Carolina, which was chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record file for this site.

The State of South Carolina concurs with the Selected Remedy. The Concurrence Letter is attached as Appendix A.

This ROD Amendment addresses modifications to two remedy components of the in-place remedies selected in the comprehensive 1998 ROD for the Site (as later modified by two Explanations of Significant Differences (ESDs) in 2001 and 2003). The remedies constructed pursuant to the 1998 ROD are and remain protective of human health under the current non-residential use of the property. Once constructed, the remedy modifications selected in this ROD Amendment will enhance the earlier remedies to permit future use of the Site for residential purposes. This ROD Amendment also includes a Technical Impracticability (TI) Waiver under CERCLA Section 121(d)(4)(C) for compliance with Safe Drinking Water Act National Primary Drinking Water regulations Maximum Contaminant Levels (MCLs) at 40 C.F.R. 141.61 for two contaminants in groundwater (identified as chemical-specific applicable or relevant and appropriate requirements (ARARs)) for portions of groundwater at the Site from an engineering perspective and site-specific conditions. This ROD Amendment is not intended to constitute a requirement that the proposed remedy modifications be implemented but instead a formal recognition that, if implemented, in accordance with the ROD, they will support commencement of the process for a partial deletion of the Site from the NPL in accordance with the NCP at 40 C.F.R 300.425(e) and thereby permit residential use.

This ROD Amendment specifically addresses the following remedy components that modify earlier remedies implemented under the 1998 ROD:

1. Changing the remedy for Non-Aqueous Phase Liquid (NAPL)/groundwater in the Old Impoundment Area (OIA) from active Recovery to the In-situ Stabilization/Solidification (ISS) of potentially mobile NAPL and contiguous areas of residual NAPL.
2. Installing a more extensive soil exposure cover to support a change in intended future land use from industrial to mixed use (with residential components).
3. Replacing certain storm water ditches with storm water conveyance piping. Replacement of certain drainage ditches with a subterranean storm sewer system will be consistent with the intended future land use. This will enhance the effectiveness and permanence of the storm water remedy under the intended future land use.
4. Under CERCLA Section 121(d)(4)(C) , due to technical impracticability from an engineering perspective and site-specific conditions, waiving compliance with the 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 as chemical-specific ARARs and which were the basis for the groundwater cleanup levels for those contaminants. Two separate Technical Impracticability waiver zones (TI zones) [a 4.5-acre TI zone for the OIA, and a one-acre TI zone for the Northwest Corner] define the spatial extent over which a groundwater ARAR waiver applies where compliance with the MCLs (i.e., ARARs) will be waived.

This ROD Amendment modifies the in-place remedies selected in the site-wide 1998 ROD for the Site and as later modified by two Explanations of Significant Difference in 2001 and 2003.

The majority of the Site is owned collectively by Ashley I, LLC and Ashley II of Charleston, LLC. These entities filed for bankruptcy in December 2015. Ashley River Investors VII (Koppers), LLC has an option to acquire the property from the lender (Magnolia/ARC Lender, LLC) that holds as collateral the portions of the Site owned by Ashley I, LLC and Ashley II of Charleston, LLC. Simultaneous with partial deletion of these portions of the Site from the NPL, contractual enrollment of the property in the South Carolina Brownfields/Voluntary Cleanup Program (VCP) for the purposes of brownfields redevelopment and liability protection will be requested by Ashley River Investors VII or its potential successors (collectively, ARI VII). Entry into the VCP requires that the respective property be de-listed from the NPL and that a party does not have a pre-existing ownership interest in the respective property. Therefore, the remedies proposed in this ROD Amendment are intended to be implemented by ARI VII prior to the time ARI VII takes title to the property. It will therefore be spending more than $25 million to cleanup property it does not own and for which it has no cleanup responsibility at this time. This is obviously a unique and unusual undertaking when a prospective purchaser is willing to spend this much money to cleanup a

property in advance of taking title to that property. ARI VII has an access agreement in place with the existing owners.

The Site is part of a 200+ acre assemblage that the City of Charleston has zoned for a mixed use brownfield development project (the Magnolia Project). This redevelopment has broad-based community support. The former Mayor of Charleston (Hon. Joseph P. Riley) publicly described this project as "a wonderful development and an extension of Charleston". The re-zoning of the project received unanimous approval from the Planning Commission (Nov. 19, 2014) and then received a unanimous vote of approval from the Charleston City Council (Jan. 13, 2015) after the third reading. The project also has the support of the neighboring communities (including the Rosemont and Wagener Terrace Neighborhoods) and non-profit organizations, including the Greater Charleston Empowerment Corporation (comprised of representatives of all minority communities located on the Charleston Peninsula and lower North Charleston), the Coastal Conservation League, the Historic Charleston Foundation and the Charleston County Parks & Recreation Commission. The Coastal Conservation League spoke in favor of the project at the Planning Commission meeting. The Historic Charleston Foundation and the Rosemont Neighborhood wrote letters of support. The Greater Charleston Empowerment Corporation and the Wagener Terrace Neighborhood all voted at their board meetings to support redevelopment of the entire Magnolia Project. Charleston County Parks & Recreation Commission has actually acquired land within the Magnolia Project.

The Parker Marine parcel, a tract currently owned by Parker Real Estate LP and in a location generally depicted on Figure 1-2, is a component of the Site to be delisted from the NPL. Unlike the remainder of the Site, the Parker Marine parcel is not owned by Ashley I, LLC or Ashley II of Charleston, LLC. Therefore, the Parker Marine Parcel is not currently contemplated to be part of the redevelopment by ARI VII. Instead, this parcel will continue to be used for commercial/industrial purposes and will not be subject to the additional remedy modifications discussed within this ROD Amendment unless and to the extent future residential use is contemplated, at which time the owner of, or any prospective developer of, the Parker Marine Parcel shall be entitled to undertake implementation of the same remedy modifications detailed in this ROD Amendment in order to secure approval for future residential use of the Parker Marine Parcel.

The Administrative Record Index maintained by the EPA includes each of the items upon which this amendment of the 1998 ROD is based. This amendment to the 1998 ROD becomes part of the Administrative Record File for the Site. The Site's Administrative Record is available for review at the Charleston County Public Library at 68 Calhoun Street, Charleston, South Carolina. The records are also available at EPA Region 4 Records Center in Atlanta, Georgia.

Assessment of the Site

Currently, there is no human exposure to groundwater through consumptive uses because drinking water in this area is provided by the local municipalities. In addition, a deed restriction prohibiting groundwater use applies to most of the Site and will be expanded to include all portions of the Site to be owned by ARI VII. Therefore, direct groundwater exposure pathways are currently incomplete and will remain incomplete in the future. Furthermore, there is no exposure to contaminated soils exceeding industrial use cleanup levels because they were either excavated and removed or are capped under engineered soil covers per the requirements of the 1998 ROD. The remedial actions implemented for soil and groundwater at the Site are currently protective of human health and the environment under an industrial land use assumption. However, the response action selected in this ROD Amendment is necessary to protect human health or welfare or the environment from actual or threatened releases of hazardous substances under a future residential land use scenario. This is a voluntary effort by a bona fide prospective purchaser that, if implemented, will support a change in land use from industrial to mixed use (with residential components).

Description of the Selected Remedy

The remedies for the Site in the 1998 ROD included:

- Excavation and subsequent capping of 22,000 tons of soil and off-site disposal at an approved hazardous waste landfill;
- Placement of approximately 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 Northwest Corner; and
- Active recovery of creosote NAPL at the Former Treatment Area (FTA) and OIA.

The proposed changes to the existing remedy are described in Section 5 of this ROD Amendment. The major components of the modified alternatives remedy are:

- Implementation of ISS of NAPL in the OIA, and
- Placement of a 12-inch clean soil layer over applicable portions of the Site.

Also, certain storm water ditches will be replaced with storm water conveyance piping or alternatively will be filled and relocated. As part of the remedy, a permanent storm water conveyance piping will be installed to replace portions of certain drainage ditches which represent part of the remedy under the 1998 ROD. In areas where ditches are replaced by permanent conveyance piping, this will enhance the remedy. If necessary, if the piping is to be replaced along Braswell Street, it will be replaced with a comparable material. In addition to modifications to the remedy, a waiver based upon technical impracticability (from an engineering perspective and site

conditions) under CERCLA Section 121(d)(4)(C) for compliance with MCLs identified as chemical specific applicable or relevant and appropriate requirements for groundwater cleanup will be invoked for two areas of the Site: 1) a one-acre area of the Northwest Corner; and 2) a 4.5-acre area of the OIA. A technical justification for this ARAR waiver for benzene and benzo(a)pyrene in groundwater has been developed in the Technical Impracticability Waiver Demonstration (TIWD).

Statutory Determinations (CERCLA §121)

The selected remedy is protective of human health and the environment, complies with Federal and State environmental requirements that are legally applicable or relevant and appropriate to the remedial action (but invokes a waiver for compliance with MCLs that are considered chemical-specific ARARs), and is cost-effective. The NAPL/groundwater remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for treatment of the principle threat source material (i.e. NAPL) through application of ISS. The soil remedy (additional soil cover and storm water modifications) prevents direct exposure to potentially contaminated surface soils under the residential soil scenario and ensures protection of human health and the environment.

EPA has completed three Five-Year Review Reports in 2003, 2008 and 2013 regarding the effectiveness of the completed and ongoing remediation work. Five-year reviews will be conducted for as long as necessary 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 SC DHEC. 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).

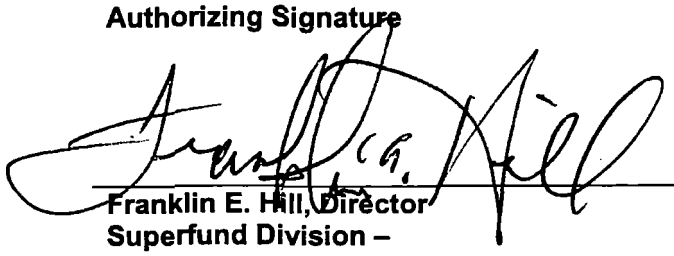
Record of Decision Data Certification Checklist

The following sections are included in the remainder of this ROD Amendment:

1. Introduction to the Site and Statement of Purpose.
2. Summary of Site Contaminants, Previous Investigations, and Remedial Actions
3. New Alternative Evaluation
4. Evaluation of Alternatives
5. Selected Remedy
6. Support Agency Comments
7. Statutory Determinations
8. Public Participation Compliance
9. References

Additional information can be found in the Administrative Record file for this Site.

Authorizing Signature



2/8/2018

Franklin E. Hill, Director
Superfund Division –
U.S. EPA Region 4

Date

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Meaning
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
AOC	Administrative Order of Consent
ARAR	Appropriate or Relevant and Applicable Requirement
ARI VII	Ashley River Investors VII or its potential successors
BAP TEQs	benzo(a)pyrene toxic equivalents
BGS	Below Ground Surface
BRA	Baseline Risk Assessment
CEMP	Comprehensive Environmental Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Constituent of Concern
CSM	Conceptual Site Model
DNAPL	Dense Non-aqueous Phase Liquid
ECs	Engineering Control
EPC	Exposure Point Concentration
EPA	United States Environmental Protection Agency
ESC	Engineered Soil Cover
ESD	Explanation of Significant Differences
FS	Feasibility Study
FTA	Former Treatment Area
ICs	Institutional Controls
ISS	In-situ Solidification/Stabilization
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NAPL	Non-aqueous Phase Liquid
NCP	National Contingency Plan
NPL	National Priorities List
NPL Deletion Eligible Property	Portion of the Site to be delisted from the NPL
O&M	Operations and maintenance
OIA	Old Impoundment Area
PAH	Polycyclic Aromatic Hydrocarbon
RA	Remedial Action
RAO	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RGO	Remedial Goal Option
RI	Remedial Investigation
ROD	Record of Decision
S/S	Stabilization/Solidification
SC DHEC	South Carolina Department of Health and Environmental Control
SVOC	Semi-Volatile Organic Compound
TI	Technical Impracticability
TIWD	Technical Impracticability Waiver Demonstration
UCL	Upper Confidence Limit
VCP	Brownfields/Voluntary Cleanup Program
VOC	Volatile Organic Compound

1.0 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

1.1 SITE NAME AND LOCATION

The Koppers Superfund Site is located in northern Charleston, South Carolina, on the west side of the peninsula formed by the Ashley and Cooper Rivers. Approximate boundaries of the Site are shown on Figure 1-1. An approximate 45 acre portion along the north portion of the Site was formerly owned by the Koppers Company (now known as Beazer East, Inc.) and used for wood treating operations. The remaining 57 acre portion of the Site, located south and adjacent to the former Koppers property, was owned by Ashepoo Phosphate/Fertilizer Works. The Site, as incorporated onto the National Priorities List (NPL), is approximately 102 acres (Figure 1-2).

The former Koppers Company, Inc. operated a wood treating facility in Charleston, South Carolina from 1940 to 1977. After 1978, subsequent to ending wood treating operations, portions of the Site were sold to other entities and used for various industrial purposes. The Site has been listed on the NPL since 1994, and a remedy protective of human health and the environment for industrial use purposes has been implemented.

The Record of Decision (ROD) Amendment has been developed to specifically address modifications to two components of the in-place remedies selected in the 1998 ROD (EPA, 1998) for the Site (as later modified by two Explanations of Significant Differences (ESDs) in 2001 and 2003). Also, certain 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, as described further in this document, a waiver of Maximum Contaminant Levels (MCLs) as chemical-specific relevant and appropriate requirements (ARARs) under CERCLA § 121(d)(4)(C) based upon a demonstration of technical impracticability (TI) for groundwater restoration will be invoked for two areas of the Site.

For completeness, the status of the Site described in the 1998 ROD is discussed briefly in the following sections. The United States Environmental Protection Agency (EPA) is the lead agency for Site activities and the South Carolina Department of Health and Environmental Control (SC DHEC) is the support agency.

1.2 PURPOSE FOR ISSUING THIS RECORD OF DECISION AMENDMENT

This ROD Amendment includes modifications to two remedy components of the in-place existing remedies selected in the comprehensive 1998 ROD for the Site (as later modified by two ESDs in 2001 and 2003). An ESD was issued in 2001 that changed the Ashley River remedy from enhanced sedimentation to installation of a protective sediment cap. A 2003 ESD changed the barge canal remedy from capping to natural sedimentation; and changed the Northwest Corner remedy from active groundwater/NAPL recovery to subsurface in-situ stabilization and solidification. The remedies constructed pursuant to the 1998 ROD are and

remain protective of human health under the current non-residential use of the property. Once constructed, the remedy modifications selected in this ROD Amendment will enhance the earlier remedies to permit future use of the Site for residential purposes. This ROD Amendment also includes a TI waiver under CERCLA Section 121(d)(4)(C) for compliance with Safe Drinking Water Act (SDWA) MCLs for two contaminants in groundwater (identified as chemical-specific ARARs) on portions of groundwater at the Site due to TI from an engineering perspective and site-specific conditions. In addition, the remedy modifications will allow the EPA to remove the majority of the Site from the NPL. This ROD Amendment is not intended to constitute a requirement that the proposed remedy modifications be implemented but instead a formal recognition that if implemented in accordance with the ROD, the proposed modifications, will support commencement of the process for a partial deletion of the Site from the NPL by EPA in accordance with the NCP at 40 C.F.R 300.425(e) and thereby permit residential use.

The purpose of this ROD Amendment is to incorporate both a waiver of the groundwater restoration ARARs within a specific portion of the Site's groundwater and approve an alternative remedial strategy which, when implemented and completed, will support commencement of the process for a partial deletion of the Site from the NPL by the EPA in accordance with the NCP at 40 C.F.R. 300.425(e). It is the intent of ARI VII but not a requirement of this ROD Amendment that, following implementation of the alternative remedial strategy, portions of the Site deleted from the NPL can be eligible for entry into the South Carolina Brownfields/Voluntary Cleanup Program (VCP) (SC §44-56-730(A)).

The Site is a key component of a larger 200+ acre assemblage that the City of Charleston has supported, approved, and zoned for a mixed-use brownfield redevelopment project (known as Magnolia). Part of this future use will include: commercial/retail use, office use, residential use, hotel use, and civic and park space. This redevelopment will include spending an additional $25 to $30 million in further cleanup to make the Site consistent with the anticipated higher and better uses that will transform this blighted area of Charleston into a new mixed use community. Proposed cleanup activities include implementation of the in-situ stabilization/solidification (ISS) of creosote-sourced dense non-aqueous phase liquid (DNAPL) in the Old Impoundment Area (OIA) as well as placement of a site-wide soil exposure barrier and replacement of certain drainage ditches with a subterranean storm sewer system. ARI VII plans to acquire and redevelop the entire 200+ acre assemblage, including the Site, provided that the majority of the Site is eligible to participate in the South Carolina Brownfields/Voluntary Cleanup Program (Article 7 of the South Carolina Hazardous Waste Management Act). However, the continued listing of the Site on the NPL may inhibit redevelopment from moving forward as NPL sites are ineligible to participate in the South Carolina Brownfields/Voluntary Cleanup Program (SC § 44-56-730(A)).

This ROD Amendment is not intended to constitute a requirement that the proposed remedy be implemented but instead provides a formal recognition that, if implemented and completed in accordance with the ROD Amendment, the proposed remedy modifications will support commencement of the process for a partial deletion of the Site from the NPL by the EPA in accordance with the NCP at 40 C.F.R. 300.425(e) and permit the NPL Deletion Eligible portion of the Site to be considered for residential use.

To facilitate Site redevelopment, upon the remedy implementation, partial deletion of the Site from the NPL will be pursued. All of the Site eligible for deletion (defined herein as the NPL Deletion Eligible Property) will be included in the EPA's deletion package, which includes all of the Site except for the 3.9 acres as depicted on Figure 1-2. Upon the deletion of the NPL Deletion Eligible Property from the NPL, enrollment of the NPL Deletion Eligible Property in the South Carolina Brownfields/Voluntary Cleanup Program for the purposes of brownfields redevelopment and liability protection can be pursued by the Developer.

This ROD Amendment includes the following remedy components that modify earlier remedies implemented under the 1998 ROD (and ESDs):

1. Changing the remedy for Non-Aqueous Phase Liquid (NAPL)/groundwater in the OIA from active Recovery to the ISS of potentially mobile NAPL and contiguous areas of residual NAPL.
2. Installing a more extensive soil exposure cover to support a change in intended future land use from industrial to mixed use (with residential component).
3. Replacing certain storm water ditches with storm water conveyance piping. Replacement of portions of certain drainage ditches with a subterranean storm sewer system will be consistent with the intended future land use. This will enhance the effectiveness and permanence of the storm water remedy under the intended future land use.
4. Under CERCLA Section 121(d)(4)(C), due to TI from an engineering perspective and site-specific conditions, waiving compliance with SDWA MCLs for benzene and benzo(a)pyrene that were identified in the 1998 ROD as chemical-specific ARARs and the basis of the groundwater cleanup levels for those two contaminants. Two separate TI waiver zones [a 4.5-acre TI zone for the OIA, and a one-acre TI zone for the Northwest Corner] define the spatial extent where compliance with the MCLs (i,e., ARARs) will be waived.

1.2.1 Rationale for Changing Remedial Action

To facilitate the proposed redevelopment, the overall Magnolia project property has been rezoned 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 amended remedy focuses 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 modification in the remedy for Site-wide soils. Also, certain storm water ditches will be replaced with storm water conveyance piping or alternatively, will be filled and relocated with storm water conveyance system in a different location. As part of the remedy, ARI VII will be installing permanent storm water conveyance piping to replace portions of certain drainage ditches which represent part of the remedy under the 1998 ROD.

EPA has determined that implementation of supplemental remedial measures is needed to achieve partial Site deletion from the NPL. Because operation of the DNAPL recovery system in its current configuration could limit development options within the OIA, a change in remedy for this area is being proposed. Additionally, the in-place engineered soil covers that are components of the Site remedy were placed with the expected future land use being industrial. To support the deletion petition, remedial activities supplemental to those already in place are necessary to allow for residential land use consistent with the proposed mixed use redevelopment at the Site. The primary components of the supplemental remedial measures include:

- ISS of potentially mobile NAPL and contiguous areas of residual NAPL in the OIA;
- Placement of a 12 inch clean soil layer over the applicable portions of the Site.

Also, certain storm water ditches will be replaced with storm water conveyance piping or alternatively will be filled and relocated. As part of the remedy, ARI VII will be installing permanent storm water conveyance system to replace portions of certain drainage ditches approved as part of the remedy under the 1998 ROD. In areas where ditches are replaced by permanent conveyance piping, this will enhance the remedy. It is ARI VII's current intention to leave the current High Density Polyethylene (HDPE) storm water piping along Braswell Street in place. If necessary, if the piping is to be replaced along Braswell Street, it will be replaced with a comparable material.

In addition to the above-listed modifications to the remedy, a waiver under CERCLA Section 121(d)(4)(C) for compliance with the MCLs at 40 CFR 141.61(a) and (c) for benzene of 5 ug/L and benzo(a)pyrene of 0.2 ug/L (identified as chemical specific ARARS)for groundwater cleanup is invoked based upon a demonstration of Technical Impracticability. The basis for this TI waiver has been developed in the TI Waiver Demonstration (TIWD) (Amec Foster Wheeler, 2016) that is included in the Administrative Record for this Site. Based upon Site conditions, the past implementation of a pump and treat recovery system and modeling, the EPA has determined that from an engineering perspective the ability of achieving the performance standard of containment and restoration of the aqueous contaminant plumes to attain the MCLs within a reasonable timeframe throughout the plumes is technically impracticable. The waiver of these ARARs for groundwater cleanup is granted for two areas of the Site: 1) a one-acre area of

the Northwest Corner; and 2) a 4.5-acre area of the OIA. A waiver of compliance with MCLs in groundwater based on TI is not being granted for the Former Treatment Area (FTA) portion of the Site.

The Remedial Action Work Plan (RAWP) (Amec Foster Wheeler, 2015) provides the basis for modification to the in-place ROD remedies. The TIWD provides a technical justification for an ARAR waiver for benzene and benzo(a)pyrene MCLs in groundwater. These two documents combine to provide the information needed to support EPA issuance of a ROD Amendment which includes invoking a waiver for compliance with the MCLs of the groundwater restoration ARARs within a specific portion of the Site's groundwater and an alternative remedial strategy. It will also allow for the removal of the residential use restriction currently included in the deed and a change of the property use classification from industrial to residential use. A waiver for technical impracticability of the groundwater restoration ARARs is not being granted for the FTA portion of the Site.

1.3 ADMINISTRATION RECORD

The Administrative Record for this Site contains the information upon which this ROD Amendment is based and includes the 1998 ROD and prior ESDs for the Site. This ROD Amendment will become part of the Administrative Record which may be found at the following information repository locations:

- Charleston County Public Library at 68 Calhoun Street, Charleston, South Carolina
- EPA Records Center, Region 4, Atlanta, Georgia

2.0 SUMMARY OF SITE CONTAMINATION, PREVIOUS INVESTIGATIONS, AND REMEDIAL ACTIONS

A brief Site history, including a summary of the EPA regulatory history for the Site, is provided in this section. The purpose of this section is to summarize the environmental impacts at the Site, and to describe the selected remedy originally presented in the 1998 ROD.

2.1 SITE HISTORY

Wood treating operations began at the Site in the early 1900's. The Koppers Company owned and operated the wood treating facility on an approximate 45 acre area in the north portion of the Site until 1977. 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. No active wood treating operations have been performed since the late 1970s. After 1978, subsequent to ending wood treating operations, portions of the Site were sold to other entities and then used for various industrial purposes.

The wood-treating operations were primarily performed in the eastern portion of the Site, designated as the FTA. Historically the Site was drained by three drainage ditches, one of which discharged to a low lying area designated as the OIA. Impacts from the wood treating operations resulted in the presence of creosote-based DNAPL in subsurface soils and groundwater in the FTA, the OIA, in a creosote residue deposit area designated as the Northwest Corner of the Site, and in Site drainage ditches. The locations of the FTA, OIA, Northwest Corner, drainage ditches and other Site features are shown on Figure 1-2.

The Site was proposed for inclusion on the NPL in 1992, and listed on the NPL in December 1994. In January 1993, Beazer entered into an Administrative Order on Consent (AOC) with EPA to perform a Remedial Investigation (RI) and Feasibility Study (FS) at the Site. This process initiated in 1993 and the Phase III RI field investigative work was completed in 1995 (ENSR, 1995a, 1995b). The FS Report (ENSR, 1996) was completed in December 1996. Parallel with RI/FS activities, an Interim Action ROD (EPA, 1995) for interim remedial actions was completed in March 1995, and implemented between June 1996 and November 1997 to address portions of certain drainage ditches. The EPA issued the Sitewide ROD in April 1998. EPA issued a Unilateral Administrative Order to Beazer to implement the Sitewide ROD on January 25, 1999. The various components of the ROD remedy were implemented and constructed by Beazer between early 1999 and mid-2003. Two Explanation of Significant Differences were issued subsequent to the April 1998 ROD, the first in August 2001, and a second in April 2003.

2.2 SITE CONSTITUENTS OF CONCERN

Wood-treatment compounds, primarily creosote-related constituents, were identified as constituents of concern (COCs) in the previous risk assessments completed as part of the RI. The COCs identified as indicator chemicals for soil impacts in the 1998 ROD included polycyclic aromatic hydrocarbons (PAHs), expressed as benzo(a)pyrene toxicity equivalents (BAP TEQs), arsenic, lead, pentachlorophenol, and dioxins/furans. Subsurface NAPLs are also a source of groundwater contamination at the Site. Creosote DNAPLs are heavier than water, and they are only slightly soluble (immiscible) in water. Creosote-sourced contaminants may be present in either residual (immobile) or free phase (pooled/potentially mobile) DNAPL form in the subsurface. Potential identified source areas included drainage ditches, which were addressed as part of the Interim ROD action and the 1998 ROD, and three remaining primary potential source areas (FTA, OIA and Northwest Corner) addressed as part of the 1998 ROD. These potential source areas contained DNAPL and creosote-related constituents in subsurface soils and groundwater, with dissolved phase creosote-related impacts in shallow groundwater. In DNAPL and shallow groundwater, COCs included creosote-related Volatile Organic Compounds (VOCs) and Semi-Volatile Compounds (SVOCs) as defined in the RAWP. Performance monitoring and operations and maintenance (O&M) reports have typically used benzene concentrations as a surrogate for total BTEX (benzene, toluene, ethylbenzene, and xylene) representations and have used naphthalene concentrations, the most mobile and abundant PAH, as a surrogate for total PAH representations in groundwater. In addition to these two indicator constituents, benzo(a)pyrene is present in select wells at concentrations above its MCL and therefore is also considered an indicator of the impact of creosote-related constituents on groundwater quality at the Site.

2.3 SUMMARY OF ROD SITE RISKS

The 1998 ROD provided a detailed summary of Site risks identified during the RI/FS/risk assessment process. The baseline human health (Black & Veatch, 1995, 1996) and ecological (Ogden, 1996) risk assessment process provided the basis for taking action and identified contaminants and the exposure pathways required to be addressed by remedial action. Potential receptors evaluated included current/future on-site workers, current/future on-site utility workers, trespassers, future on-site residents, and future marina workers. Investigations were also conducted to evaluate potential impacts on ecological receptors. Media of concern evaluated included surface and subsurface soils, groundwater/NAPL, sediment and surface water. While the 1995 Interim Action ROD addressed significant sediment and surface water exposure concerns, the 1998 ROD addressed cleanup levels for the following medias of concern: surface/subsurface soil and drainage ditch sediments; groundwater/NAPL; and sediments of the Ashley River, Barge Canal and tidal marshes.

Surface/subsurface soil and drainage ditch sediments cleanup levels were developed based on a future industrial exposure scenario for the future on-site worker, and results of the risk assessment performed in support of the RI identified COCs in on-site surface/subsurface soils at concentrations greater than those deemed adequately protective of the future on-site worker.

The risk assessment concluded that potential risks were posed for ecological receptors, including the benthic community that frequent the Ashley River, so criteria were established for the long-term protection of ecological resources based on the impacts to sediments of the Ashley River, Barge Canal and tidal marshes.

As concluded in the RI, the deep water bearing zone underlying the Site was not impacted by the COCs and was therefore not included in required remedial actions. Impacted groundwater is confined to the shallow geologic unit that has little or no potential of being an underground source of drinking water; further, drinking water in this area is provided by the local municipalities.

There are no potential present or future groundwater users either on the Site or off-Site. For these reasons, groundwater exposures are assumed to be incomplete. Due to the presence of DNAPL and groundwater concentrations of COCs that exceeded applicable MCLs, performance standards for groundwater/NAPL were established in the 1998 ROD including the removal, treatment and containment of NAPL and the containment and restoration of aqueous contaminant plumes.

The risk assessment performed as part of the RI/FS provided the basis for the selected remedy in the 1998 ROD, in order that the selected remedy be protective of anticipated future commercial/industrial Site use. The 1998 ROD selected a Site-wide, multi-media response action to address surface/subsurface soil, sediments of drainage ditches, groundwater and NAPL, surface water, contaminant transport pathways, and sediments of the Ashley River, Barge Canal, and North/South/Northwest Tidal Marshes. The 1998 ROD and subsequent ESD remedies were implemented by Beazer to address identified risks, and are summarized below in Section 2.4.

2.4 SUMMARY OF ROD REMEDIAL ACTIONS

The Site-wide remedy was completed by Beazer 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 subaqueous cap in the Ashley River;
- Monitored Natural Recovery for the Barge Canal;
- In-situ solidification/stabilization at the Northwest Corner; and
- Active recovery of creosote-based DNAPL at the FTA and OIA with a pump and treat system.

Figure 2-1 presents an overview of the ROD remedial actions implemented.

Since October 2003, active DNAPL 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-like NAPL has been recovered from the FTA and OIA, respectively.

In summary, a remedy protective of human health and the environment for industrial use purposes has been implemented at the Site. The 1998 ROD remedy has operated and functioned as designed, as documented in annual performance monitoring reports and EPA Five-Year Reviews.

2.5 SUMMARY OF SITE ACTIVITIES/INVESTIGATIONS CONDUCTED SINCE THE 1998 ROD

As described in the previous section, the various components of the 1998 ROD remedy were implemented and constructed between early 1999 and mid-2003. The Final Remedial Action Report (URS, 2003) was issued in August 2003 and documented final implementation of ROD-related activities. The April 2004 Comprehensive Environmental Monitoring Plan (CEMP) (Malcolm Pirnie, 2004) documented inspection and operations and maintenance (O&M) program requirements for the various 1998 ROD remedy components. Periodic O&M reports have been provided to EPA and SC DHEC since 2004; currently these reports are provided to EPA and SC DHEC on an annual basis.

The initial post-ROD implementation effectiveness monitoring report prepared to evaluate the effectiveness of the DNAPL/groundwater remedies was reported in the 2006 Performance Evaluation Report (Key, 2006). After four years of system operation, in late 2007 and during 2008, several borings, monitoring wells and piezometers were installed in the OIA to further characterize subsurface conditions and evaluate DNAPL properties.

Additionally, in 2010, soil borings were advanced in the OIA, to evaluate the presence/absence of creosote-related DNAPL in and around the periphery of previously estimated limits of the area, or in areas with limited prior investigation. Information from this supplemental investigation was provided in the RAWP.

EPA completed Five Year Reviews in 2008 and 2013. Documentation of the effectiveness and appropriateness of the performance monitoring and O&M programs can be found in the Annual Operations and Monitoring Reports and in the EPA's 2008 and 2013 Five Year Reviews.

2.6 UPDATED SUMMARY OF SITE RISKS

In the RAWP, a risk evaluation was completed to evaluate post-ROD soil conditions at the NPL Deletion Eligible Property in consideration of future redevelopment potentially including future residential use. On-Site soils were previously remediated to achieve cleanup goals protective of commercial/industrial workers. During ROD implementation, the most contaminated soils were excavated and transported off-site for disposal at an EPA approved landfill. Approximately 40 acres of the Site were then capped with engineered soil covers to reduce the future potential for industrial use exposures to contaminated soil.

To support potential redevelopment of the NPL Deletion Eligible Property for residential use, an evaluation of potentially complete soil exposure pathways and associated risks was completed as part of the RAWP. Exposure assumptions used for the soil risk evaluation were based on current EPA default assumptions for future Site residents and future Site workers that might be involved in construction activities at the Site. Current EPA and SC DHEC risk assessment guidance was followed in the calculations of exposure intakes, assessment of toxicity, and characterization of direct soil contact risks.

For the residential residual risk evaluation, surface soil data from previous investigations was reviewed. To evaluate potential future residential use risk associated with residual soil conditions, soil data for the Site were assessed to identify soil samples that:

1. Have not been excavated and removed;
2. Have not been covered with an engineered cover; and
3. Have not been addressed through implementation of prior remedies (stabilization, sediment removal from ditches, etc.)

Surface soil samples (0 to 1 foot in depth) were identified in the data that met the above requirements. At locations where there are concrete foundations/slabs remaining, no soil data have been collected during the RI/FS or post-FS investigations. To address this potential data gap, it was assumed that current soil concentrations beneath existing slabs are similar in concentration to those included in the pre-development risk assessment data set.

Using data for these locations, exposure point concentrations (EPCs) were calculated for Site COCs. Because remedies have been implemented since the completion of the RI Report and human health and ecological risk assessments; current Site conditions no longer reflect the data that were collected and presented in the RI Report and the risk assessments. Therefore,

although the current presence and extent of COCs is an uncertainty, potential future use exposures will be addressed through engineering controls such as the introduction of 12 inches of clean soil on applicable portions of the surface of the Site and the placement of markers to limit future excavation. These proposed engineering controls will be protective of human exposures to Site COCs.

In accordance with current EPA guidance for risk assessment, the upper confidence limit of the arithmetic mean, or UCL, for COCs (except lead) were used as the EPCs for soil. For lead, the arithmetic mean was used as the EPC. UCLs were calculated using current EPA guidance.

Residential remedial goals were calculated based on a risk range of 1 x 10-6 to 1 x 10-4 and were compared to the EPCs for the COCs. Included in the risk range are values for a target risk of 5 x 10-5, which was the accepted target risk used in the 1998 ROD. The resulting UCLs for arsenic (10 mg/kg) and for BAP TEQ (7.4 mg/kg) were greater than risk-based Remedial Goal Options (RGOs) based on target risks of 1 x 10-6 and 1 x 10-5; however, both lead and pentachlorophenol were less than the RGOs. For another line of evidence, the EPC for arsenic was compared to background concentrations from the 1995 RI investigations. The calculated UCL for arsenic using 47 data points is approximately equivalent to background. The BAP TEQ UCL is equivalent to a target risk of 6.4 x 10-5, indicating potentially unacceptable risk for future residents without future exposure controls. As a result of these risk evaluations, certain Site remedy modifications were identified to address a future Site use scenario that included residential use.

The remedy modifications outlined in this ROD Amendment include the placement of 12 or more inches of clean fill during Site re-grading in support of Site redevelopment. Placement of 12 inches or greater of clean fill soils will prevent direct exposure to potentially impacted surface soils under the future residential-use soil scenario.

The updated risk evaluation indicated no adverse risks or hazards for future construction or utility workers exposed to soil. However, in order to accommodate a future mixed-use scenario (including residential use), certain modifications and modifications to the existing soil cover are needed and will be incorporated into redevelopment of the Site to be protective of future receptors. These modifications are described in Section 5 and include the placement of 12 or more inches of clean soil cap over applicable portions of the Site during the site re-grading work. Placement of 12 inches 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.

The proposed additional OIA DNAPL remedy is described in Section 5 below. Consistent with groundwater exposure assumptions presented in the 1998 ROD, drinking water in this area is

provided by the local municipalities, and direct groundwater exposure pathways in the OIA are currently incomplete and are expected to remain incomplete in the future.

3.0 NEW ALTERNATIVE EVALUATION

This section includes a description of the ARARs consistent with the National Contingency Plan (NCP), Section 400(f)(i)(A) and RAOs identified in the 1998 ROD, which will apply to the new remedy and then to the extent implemented, and how the remedy change will affect each ARAR. The original remedy and the new proposed remedy components are compared.

3.1 DESCRIPTION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Section 121(d) of CERCLA, as amended, specifies, in part, that remedial actions for cleanup of hazardous substances must comply with requirements and standards under federal or more stringent state environmental laws and regulations that are applicable or relevant and appropriate (i.e., ARARs) to the hazardous substances or particular circumstances at a site or obtain a waiver. See also 40 C.F.R. § 300.430(f)(1)(ii)(B) and 430(f)(5)(ii)(B) and (C). ARARs include only federal and state environmental or facility siting laws/regulations and do not include occupational safety or worker protection requirements. Compliance with OSHA standards is required by 40 C.F.R. § 300.150 and therefore the CERCLA requirement for compliance with or wavier of ARARs does not apply to OSHA standards.

Under CERCLA Section 121(e)(1), federal, state, or local permits are not required for the portion of any removal or remedial action conducted entirely on-site as defined in 40 C.F.R. § 300.5. See also 40 C.F.R. §§ 300.400(e)(1) & (2). Also, CERCLA actions must only comply with the "substantive requirements," not the administrative requirements of a regulation. Administrative requirements include permit applications, reporting, record keeping, and consultation with administrative bodies. Although consultation with state and federal agencies responsible for issuing permits is not required, it is recommended for determining compliance with certain requirements such as those typically identified as Location-Specific ARARs.

'Applicable requirements', as defined in 40 C.F.R. § 300.5, means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstance at a CERCLA site. Only those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be applicable. 'Relevant and appropriate requirements', as defined in 40 C.F.R. § 300.5, means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at a CERCLA site that their use is well suited to the particular site. Only

those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

In addition to ARARs, the lead and support agencies may, as appropriate, identify other advisories, criteria, or guidance to be considered for a particular release. The "to-be-considered" (TBC) category consists of advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies. See 40 C.F.R. § 300.400(g)(3).

ARARs Categories

For purposes of ease of identification, the EPA has created three categories of ARARs: Chemical-, Location- and Action-Specific.

Action-specific ARARs are usually technology-based or activity-based requirements or limitations that control actions taken at hazardous waste sites. Action-Specific requirements often include performance, design and controls, or restrictions on particular kinds of activities related to management of hazardous substances. Action-specific ARARs are triggered by the types of remedial activities and types of wastes that are generated, stored, treated, disposed, emitted, discharged, or otherwise managed.

Chemical-Specific ARARs are usually health or risk based numerical values limiting the amount or concentration of a chemical that may be found in, or discharged to, the environment. The Safe Drinking Water Act (SDWA) MCLs at 40 C.F.R. Part 141 and the state or federal ambient water quality criteria established under Section 303 or 304 of the Clean Water Act are examples of Chemical-Specific ARARs that are used to establish remediation levels for restoration of groundwater and surface water that are current or potential sources of drinking water. See 40 C.F.R. §§ 300.430(e)(2)(i)(B), (C), & (E).

Location-Specific requirements establish restrictions on permissible concentrations of hazardous substances or establish requirements for how activities will be conducted because they are in special locations (e.g., wetlands, floodplains, critical habitats, streams). Location-Specific ARARs/TBC guidance typically include Executive Orders on federal actions in floodplains and Clean Water Act regulations for discharges of dredged material or activities affecting aquatic resources such as wetlands.

Remedial actions at Superfund sites are required to meet the substantive requirements of any applicable legal criteria, otherwise known as ARARs of the site. The Federal and State ARARs which are applicable or relevant to the amended remedy for the Site are presented in Tables 3-1a Location-Specific ARARs/TBCs and 3-1b Action-Specific ARARs/TBCs. An ARAR waiver on the basis of technical impracticability of groundwater restoration is also discussed.

ARAR Waiver

A waiver under CERCLA Section 121(d)(4)(C) for compliance with the MCLs for benzene of 5 ug/L and benzo(a)pyrene of 0.2 ug/L at 40 C.F.R 141.61(a) and (c) (identified as chemical-specific ARARs) for groundwater cleanup is invoked based upon a demonstration of TI. The basis and justification for this TI waiver has been developed in the TIWD that is included in the Administrative Record for this Site. Based upon Site conditions, the past implementation of a pump and treat recovery system and modeling, the EPA has determined that from an engineering perspective the ability of achieving the remedial objective of restoration of the aqueous contaminant plumes to attain the MCLs within a reasonable timeframe throughout the plumes is technically impracticable. The waiver of these ARARs for groundwater cleanup is being invoked for two areas of the Site: 1) a one-acre area of the Northwest Corner; and 2) a 4.5-acre area of the OIA. A waiver of compliance with MCLs in groundwater based on TI is not being granted for the Former Treatment Area (FTA) portion of the Site.

The TIWD provides the information necessary to support issuance of the ROD Amendment to incorporate a waiver of the groundwater restoration ARARs within a specific portion of the Site's groundwater.

3.1.1 Remedial Action Objectives

Remedial Action Objectives (RAOs) identified in the 1998 ROD for the protection of human health and the environment were developed in the RI Report. Remedial cleanup goals were developed in more detail in the FS Report, to identify areas to be addressed with remedial action. Consistent with the 1998 ROD, a remedy protective of human health and the environment based on industrial use purposes was implemented by Beazer.

To facilitate the proposed redevelopment project, designated the Magnolia Project, a change in land use from industrial to mixed-use purposes (including residential) will occur. The exposure assumptions used at the time of original remedy selection were reviewed and updated. To allow implementation of a mixed-use redevelopment on the Site, changes to elements of the existing remedy will be implemented to allow for residential land use. The changes in remedy focus on two main components of the remedy as implemented pursuant to the 1998 ROD (the DNAPL/Groundwater remedy in the OIA and Site-wide soils in those portions of the Site that will be used for residential use under the proposed redevelopment). This section summarizes the remedial action objectives for the associated areas of the Site where modification to the remedy is being sought.

NAPL/Groundwater

Three potential source areas of subsurface NAPL and impacted groundwater (FTA, OIA and Northwest Corner) have been previously identified at the Site. EPA has adopted long-term

remediation objectives for sites where NAPL is encountered in groundwater' as presented in the EPA OSWER Directive 9234.2-25, "Guidance for Evaluating the Technical Impracticability of Groundwater Restoration (EPA 1993)". The groundwater/NAPL performance standards for the FTA and OIA consistent with this guidance and identified in the 1998 ROD (Sect. 9.2.1) is to remove or control NAPL discharges, and mitigate further migration of dissolved phase constituents from NAPL source areas through:

- Removal or treatment of NAPL to the maximum extent practicable.
- Containment of potentially non-restorable source areas, and
- Restoration of aqueous contaminant plumes.

Pursuant to the Site remedy components identified in the 1998 ROD, as amended by the ESDs, the Northwest Corner was addressed by immobilizing NAPL using an in-situ stabilization/solidification (ISS) process similar to that proposed in this ROD Amendment for the OIA. The selected remedy in the OIA and FTA has been removal and containment of NAPL source material by operation of DNAPL extraction systems. The ISS remedy adopted by this ROD Amendment in the OIA will address NAPL mobility and minimize leaching potential and contain non-restorable source areas.

Federal and State chemical-specific ARARs were identified in the 1998 ROD and included the SDWA MCLs for contaminants listed in 40 C.F.R. 141.61 and 141.62. These MCLs were the basis for the cleanup levels of contaminants in Site groundwater. Because it was recognized that restoration of the groundwater to these levels may be technically impracticable, performance standards were established in the 1998 ROD, as described above. Performance monitoring for groundwater has been performed since ROD remedy implementation in 2003. The monitoring program evaluates the effectiveness of the NAPL extraction systems and the viability of MNA to address restoration of the aqueous plume, and includes groundwater quality monitoring for analysis of wood-treating related COCs, and for natural attenuation parameters.

The TIWD provides a technical justification for waiving specific groundwater ARARs (namely the MCLs for benzene of 5 ug/L and benzo(a)pyrene of 0.2 ug/L at 40 C.F.R 141.61(a) and (c)) that were identified as drinking water criteria in the 1998 ROD within delineated TI waiver zones at the Site in the NPL Deletion Eligible Property. As a post-ROD/post-remedy implementation TIWD, the report relied on thirteen years of monitoring data which were used to evaluate the effectiveness of implemented ROD remedies (including the preferred remedy of stabilization/solidification at the Northwest Corner, similar to that being proposed for the OIA), and to assess groundwater restoration potential. The applicability of a TI waiver for groundwater ARARs at 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): 1) hydrogeologic factors; 2) contaminant-related factors;, and 3) technological

factors. Without exception, all of these criteria support the decision to establish a Site-specific TI waiver for groundwater ARARs.

Extensive groundwater flow modeling was performed with a 3D, finite difference groundwater flow model (MODFLOW) primarily to evaluate cleanup timeframes associated with the three remedial alternatives: (1) Gradient Enhanced Recovery, institutional controls (ICs) and engineering controls (ECs); (2) ISS, ICs and ECs; and (3) thermal remediation (Steam In-Situ Thermal Treatment (ISTT), Electrical Resistance Heating ISTT, ICs and ECs).

Separate fate and transport models were developed for benzene, naphthalene, and benzo(a)pyrene. Fate and transport parameters (dispersion, retardation, dissolved-phase biodegradation, and diffusion) were assigned to all areas of the model domain, including DNAPL areas.

The persistence of dissolved-phase impacts for over 100-years for all three modeled constituents (naphthalene, benzene, and benzo(a)pyrene) in all three remedial scenarios demonstrated that full restoration of groundwater to attain MCLs (identified as chemical-specific ARARs) for benzene and benzo(a)pyrene is technically impracticable at this Site.

Soils

In the 1998 ROD, general remedial goals for soil are as follows:

- Reduce potential human health risks from exposure to surface and subsurface soils to levels deemed to be adequately protective as delineated in the Baseline Risk Assessment (BRA) (Black & Veatch, 1995, 1996).

No chemical-specific ARARs were identified to specifically address soil. Remedial goals for soil were based on the BRA for future Site workers in an industrial setting. The EPA remedial goals for the identified COCs were based on potential carcinogenic risk from 1 x 10-6 to 1 x 10-4 and hazard indices from 0.1 to 3. These objectives were achieved by a combination of general response actions consisting of capping, removal, and disposal of soils with levels of COCs greater than levels considered to be protective by EPA, and with institutional controls.

To be protective of the intended future land use scenario (including a residential use component) associated with the planned Magnolia development project, the conceptual site model (CSM) was reviewed with focus on potential changes in human exposure assumptions for Site soil. Based on the potential change in exposure scenario, the BRA was reviewed per the proposed land use change, and evaluated relative to remedial goals consistent with proposed Site re-use. Based on information presented in the BRA, the residential Remedial Goal Options (RGOs) are assumed to be applicable to the Site redevelopment. Results of the evaluation indicated that the previously implemented soil remedy meets the non-residential RGOs but does

not meet the residential RGOs that would apply under for the proposed Magnolia Project, and therefore, additional measures to control exposure to soil are needed if redevelopment is to include a residential component. Because the EPA goals were used to develop specific remediation goals for each COC that would result in acceptable residual risks after remediation activities were completed, a residual risk evaluation was performed to demonstrate how the remedy (additional soil cover) will meet the performance standards for future residential use.

The 1998 ROD soil remedy (excavation and placement of engineered soil covers (ESCs)) is adequately protective for future on-site workers (surface soil) and future utility workers (subsurface soil) under an industrial land use scenario. However, based on the results of the residential risk evaluation, modifications to the in-place soil cover remedy are necessary to accommodate the proposed future residential use at the Site. To allow for development of the Site, placement of a 12 inch thick clean soil layer will occur over applicable portions of the Site in conjunction with land use controls 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 RGOs.

Soil cover systems, in conjunction with land use controls, are a presumptive remedy to establish an exposure barrier to direct contact by residential receptors and are commonly employed on brownfield sites such as the Site.

4.0 EVALUATION OF ALTERNATIVES

4.1 COMPARATIVE ANALYSIS OF ALTERNATIVE

The proposed remedial alternative includes ISS of the remaining NAPL in the subsurface in the OIA and placement of a minimum 12 inch thick clean soil layer over applicable portions of the Site as an engineering control to prevent exposure to future receptors and to allow for mixed use development (including residential use). This proposed remedial alternative has been evaluated with respect to the nine evaluation criteria set forth in the NCP, 40 CFR Section 300.430(e)(9)(iii). These criteria, listed below, address the requirements of CERCLA, and additional EPA technical and policy considerations that are important for selecting remedial actions. Table 4-1 identifies the proposed RA for the Site and the original remedy from the 1998 ROD and serves as a basis for comparison to the NCP criteria. The purpose of the analysis below is to identify the relative advantages and disadvantages of the new alternative. A brief description of the NCP evaluation criteria is presented below. A summary of the analysis of the proposed alternative for the Site based on the proposed new use is included in this section.

Threshold Criteria:	Overall Protection of Human Health and the Environment
	Compliance with ARARs
Primary Balancing Criteria:	Long-term Effectiveness
	Reduction of Toxicity, Mobility, or Volume
	Short-term Effectiveness
	Implementability
	Cost
Modifying Criteria:	State Acceptance
	Community Acceptance

4.1.1 Overall Protectiveness of Human Health and the Environment

Immobilizing NAPL using ISS will mitigate exposure and minimize continued leaching of contaminants to groundwater. This remedy is protective of human health as it isolates and prevents potential exposure to human receptors currently and in the future. The existing remedy of NAPL recovery removes source, controls migration, reduces mass and volume and is protective of human health. The proposed remedy and existing remedy are technically impracticable of achieving restoration of groundwater to MCLs.

The proposed surficial soil cover is protective of residential receptors as it blocks exposure pathways and minimizes transport of contaminant mobility due to erosion. The proposed remedy is protective of human health as an engineering control to prevent exposure to residential receptors and the environment. The existing remedy is protective of human health

under the current non-residential use scenario but poses potential unacceptable risk to human health for the intended future land use scenario (including residential use).

ICs and ECs would provide additional protectiveness for future human health receptors and maintain the exposure pathway as incomplete. Institutional controls will be implemented on the property to prohibit the use of groundwater underlying the Site to prevent unacceptable exposure. 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. Additionally, institutional controls will be placed on the property to prevent exposure to soils underneath the cap material.

4.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Both the proposed ISS remedy and the existing NAPL recovery remedy comply with identified ARARs except a waiver of the MCL ARAR for benzene and benzo(a)pyrene in groundwater is being invoked under CERCLA Section 121(d)(4)(C) due to technical impracticability from an engineering perspective.

A waiver under CERCLA Section 121(d)(4)(C) for compliance with the MCLs for benzene of 5 ug/L and benzo(a)pyrene of 0.2 ug/L at 40 C.F.R 141.61(a) and (c) (identified as chemical-specific ARARs) for groundwater cleanup is invoked based upon a demonstration of TI. The basis and justification for this TI waiver has been developed in the TIWD that is included in the Administrative Record for this Site. Based upon Site conditions, the past implementation of a pump and treat recovery system and modeling, the EPA has determined that from an engineering perspective the ability of achieving the remedial objective of restoration of the aqueous contaminant plumes to attain the MCLs within a reasonable timeframe throughout the plumes is technically impracticable. The waiver of these ARARs for groundwater cleanup is being invoked for two areas of the Site: 1) a one-acre area of the Northwest Corner; and 2) a 4.5-acre area of the OIA. A waiver of compliance with MCLs in groundwater based on TI is not being granted for the FTA portion of the Site.

This remedy recognizes the continuation of the current 1998 ROD remedy of MNA of groundwater through natural degradation of Site-specific COCs.

No chemical-specific ARARs were identified to specifically address soil. The 1998 ROD remedial goals for soil were based on the BRA for future Site workers in an industrial setting. The EPA remedial goals for the identified COCs were based on potential carcinogenic risk from 1 x 10-6 to 1 x 10-4 and hazard indices from 0.1 to 3. This objective was achieved in the 1998 ROD by a combination of general response actions consisting of capping, removal, and disposal of soils with levels of COCs greater than levels considered to be protective by EPA, and with institutional controls. Based on the results of the updated residential risk evaluation in the

RAWP, modifications to the in-place soil cover remedy are necessary to accommodate potential residential use at the Site. To allow for future residential-use development of the Site, placement of a 12 inch thick clean soil layer over applicable portions of the Site in conjunction with land use controls to prevent exposure to residential receptors is necessary.

The primary objective of the proposed soil cover is to prevent direct contact with surface soil contaminants with concentrations in excess of residential RGOs.

The surficial soil cover complies with applicable or relevant and appropriate federal and state environmental laws.

4.1.3 Long-Term Effectiveness and Permanence

In-situ stabilization effectively immobilizes NAPL thereby preventing further migration and reducing ongoing leaching of COCs to groundwater. The existing NAPL recovery remedy also prevents migration and removes source material. Both remedies are technically impracticable of achieving cleanup goals within a reasonable timeframe.

Placement of 12 inches or greater of clean fill soils over applicable areas of the Site will prevent direct exposure to potentially impacted surface soils under the residential soil scenario. The existing soil remedy is effective under the current non-residential use scenario but will not be effective for the intended future mixed use scenario (including residential use). O&M is required to maintain long term effectiveness of the soil cover.

4.1.4 Reduction of Toxicity, Mobility, or Volume

In-situ stabilization immobilizes NAPL thus preventing mobility. While mass and volume are not reduced, COCs are bound into a soil/cement matrix preventing future exposure and minimizing leachability thereby reducing NAPL sourcing to groundwater. The existing NAPL recovery remedy reduces mass and volume over time and is not as effective as ISS in reducing mobility. However, it has been demonstrated that MCLs for benzene and benzo(a)pyrene will not be achieved within a reasonable timeframe for either remedy.

The placement of a minimum of 12 inches of clean soils over applicable areas of the Site prevents direct exposure and reduces mobility by eliminating transport via erosion but has no effect on the toxicity or volume of COCs. Under the existing soil remedy, there is no change in mobility, toxicity or volume of COCs.

4.1.5 Short-Term Effectiveness

In-situ stabilization is immediately effective in blocking the exposure pathway, immobilizing NAPL, and reducing contaminant sourcing to groundwater. There is no short term impact associated with the existing NAPL remedy as it is already in place.

Surficial soil capping is also immediately effective in blocking the exposure pathway, preventing direct exposure to potentially impacted surface soils under a future residential use scenario. The existing remedy is effective under the current non-residential use scenario but is not effective for the intended future mixed use scenario (including residential land use).

4.1.6 Implementability

ISS is implementable at the Site. Stabilization/solidification was successfully implemented at the Site in the Northwest Corner. ISS is considered a presumptive remedy, and is a proven technology having been implemented at many creosote DNAPL sites across the country. Applicable ICs and ECs are easily implemented.

Surficial soil capping is a readily implementable, straight-forward and reliable technology.

4.1.7 Cost

The estimated cost for ISS in the OIA is approximately $6,003,000.

The estimated cost of civil site work to prepare the NPL Deletion Eligible Property for development is approximately $11,698,000, of which $5,340,000 represents earthwork and grading to install the soil cover system and $1,595,000 represents storm water drainage improvements.

4.1.8 State Acceptance

The State of South Carolina has concurred with the selected remedy. The concurrence letter is attached as Appendix A.

4.1.9 Community Acceptance

ISS and soil capping should be acceptable to the community as it supports the redevelopment of the Site to a beneficial reuse scenario including a mix of uses that can be used by the community. Risks to construction workers and the public during implementation and afterwards are manageable through best management practices and an enforceable management plan.

In addition, the Magnolia Project, which includes the Site has broad-based community support. The former Mayor of Charleston (Hon. Joseph P. Riley) publicly described this project as "a wonderful development and an extension of Charleston". The re-zoning of the project received

unanimous approval from the Planning Commission (Nov. 19, 2014) and then received a unanimous vote of approval from the Charleston City Council (Jan. 13, 2015) after the third reading. The Magnolia Project also has the support of the neighboring communities (including the Rosemont and Wagener Terrace Neighborhoods) and non-profit organizations, including the Greater Charleston Empowerment Corporation (comprised of representatives of all minority communities located on the Charleston Peninsula and lower North Charleston), the Coastal Conservation League, the Historic Charleston Foundation and the Charleston County Parks & Recreation Commission. The Coastal Conservation League spoke in favor of the project at the Planning Commission meeting. The Historic Charleston Foundation and the Rosemont Neighborhood wrote letters of support. The Greater Charleston Empowerment Corporation and the Wagener Terrace Neighborhood all voted at their board meetings to support redevelopment of the entire Magnolia Project. Charleston County Parks & Recreation Commission has actually acquired land within the Magnolia Project.

Following EPA's publication of the Proposed Plan corresponding to this ROD Amendment on September 18, 2017 a Public Meeting was held in Charleston, SC near the Site on September 28, 2017. Public comments received during that meeting indicated general support for the Proposed Plan, with little opposition expressed. The Responsiveness Summary and a transcript of the public meeting is attached as Appendix B.

5.0 SELECTED REMEDY

The remedy selected for the Site includes in-situ stabilization/solidification of NAPL in the OIA and the placement of 12 inches or greater of clean fill soils over applicable areas of the Site.

5.1 DESCRIPTION OF THE SELECTED REMEDIES

NAPL/Groundwater Remedy

To achieve long-term source control that will allow for NPL Deletion of the NPL Deletion Eligible Property, ISS will be conducted on the 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. ISS treatment of shallow zone potentially mobile NAPL will be accomplished using a dual axis rotary blender or similar technique capable of thoroughly homogenizing the material. ISS treatment of shallow zone potentially mobile NAPL is typically conducted by mixing the soil with a calculated grout volume for a 10' x 10' grid pattern to complete the solidification to the specified design depths. The mean treatment depth in the shallow zone from the top of pre-ISS excavation to the bottom of the potentially mobile and limited areas of contiguous residual NAPL is approximately 8.3 feet. A cell layout with 10' x 10' grids was developed with designated rows (Figure 5-1).

ISS treatment of intermediate zone potentially mobile and limited areas of contiguous residual NAPL will be accomplished via a series of overlapping auger-installed ISS treatment columns. The ISS treatment columns in the intermediate zone will extend from the pre-ISS excavation elevation (approximately 4 ft-msl) to the bottom of the treatment zone, approximately 32 to 34 ft-bgs, and key into the confining clay layer. ISS swell material will be primarily managed within the pre-ISS excavation area surrounding the treatment zone. In collaboration with the selected contractor, a specific ISS column layout will be developed using overlapping adjacent columns to effectively stabilize 100% of the mixing area. The ISS slurry mix will be designed to meet treatment goals for unconfined compressive strength and permeability (hydraulic conductivity) as defined in the RAWP (e.g., 50 psi average of all samples for unconfined compressive strength and $1x10^{-6}$ cm/sec average of all samples for hydraulic conductivity). The area to be treated is approximately 1.5 acres. Figure 5-1 provides the layout for the shallow zone mixing grid and the intermediate zone ISS columns. Groundwater monitoring will be conducted to assess the performance of the ISS.

A waiver under CERCLA Section 121(d)(4)(C) for compliance with the MCLs for benzene of 5 ug/L and benzo(a)pyrene of 0.2 ug/L at 40 C.F.R 141.61(a) and (c) (identified as chemical-specific ARARs) for groundwater cleanup is invoked based upon a demonstration of TI. The basis and justification for this TI waiver has been developed in the TIWD that is included in

the Administrative Record for this Site. Based upon Site conditions, the past implementation pump and treat recovery system and modeling, the EPA has determined that from an engineering perspective the ability of achieving the remedial objective of restoration of the aqueous contaminant plumes to attain the MCLs within a reasonable timeframe throughout the plumes is technically impracticable. The applicability of a TI waiver for groundwater ARARs at the OIA and Northwest 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. The details of this process can be found in the TIWD. The TI waiver demonstration employed a groundwater flow model, calibrated with Site-specific aquifer characteristics, to evaluate the time required to meet drinking water standards for benzene and benzo(a)pyrene. The model input parameters used to determine the area appropriate for the TI waiver zone were based on site-specific data, were consistent with literature values and data from other creosote sites, and were supported by model calibration and by specific model sensitivity analyses performed as provided within the Administrative Record.

The TI evaluation determined that regardless of the remediation approach employed (ISS source control or "status quo"), a limited halo of benzene exists 20 to 100 feet downgradient of the NAPL source area for 80 to 100 years. The waiver of these ARARs for groundwater cleanup is being invoked for two areas of the Site: 1) a one-acre area of the Northwest Corner; and 2) a 4.5-acre area of the OIA. The TI zones for the OIA and Northwest Corner are shown on Figure 5-2. The total 5.5-acre TI zone area represents about 5% of the 102-acre Site. A waiver of compliance with MCLs in groundwater based technical impracticability is not being granted for the FTA portion of the Site. With respect to the OIA, the 4.5 acre TI zone was established based on an original model calibration presented in the TIWD; subsequent sensitivity analyses, alternate model calibration, and model scenarios inclusive of residual soil staining areas further confirmed the 4.5 acre areal extent employed for the OIA TI waiver zone. Within the 4.5 acre TI waiver zone, benzene and benzo(a)pyrene may be present in groundwater and impractical to remediate, considering the irregularly distributed areas of residual soil staining around the OIA. These residual NAPL zones may be present anywhere within the TI waiver zone. The western boundary of the OIA TI waiver zone was conservatively extended across the end of the Barge Canal as a result of the following factors: difficulty with installing groundwater monitoring wells, uncertainty of the subsurface data in the unconsolidated sediment data, hydrologic connectivity between the OIA and the barge area and the groundwater flow direction regime in that area. The results of the Northwest Corner modeling effort also support the one-acre areal extent employed for the Northwest Corner TI waiver zone.

Soil Remedy

The remedy selected in the 1998 ROD for Site soils and drainage ditch sediments was placement of an engineered cover or the excavation and subsequent placement of engineered cover in designated portions of the Site. The soil remedy was implemented and remains 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 (to evaluate risk under a residential land use scenario), 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 (including portions of the Site within the 100 year floodplain) as an engineering control to prevent exposure to residential receptors. Figure 5-3 shows the preliminary layout of the supplemental soil cover. 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 cover material.

In addition, certain storm water ditches will be replaced with storm water conveyance piping or alternatively will be filled and relocated. As part of the remedy, a permanent storm water conveyance piping will be installed to replace portions of certain drainage ditches which represent part of the remedy under the 1998 ROD. In areas where ditches are replaced by permanent conveyance piping, this will enhance the remedy.

Following the Remedial Design phase, 100% Design Plans and Specifications for the ISS and soil cover/storm water system will be submitted to EPA and SC DHEC for review prior to implementation. The selected remedy may change somewhat as a result of the remedial design and construction practices. Changes to the remedy described in the ROD will be documented accordingly.

5.2 POTENTIAL MODIFICATIONS OF THE SELECTED REMEDIES

Throughout implementation of the remedies, remedy performance will be monitored and adjusted as warranted to meet the performance criteria (e.g., 50 psi average of all samples for unconfined compressive strength and $1x10^{-6}$ cm/sec average of all samples for hydraulic conductivity) specified in the RAWP. Modifications may include any or all of the following:

1. During the design process, alternate ISS methods and techniques will be evaluated and may be selected for implementation based on cost and schedule considerations.
2. ISS mixing techniques capable of thoroughly homogenizing the material and achieving the performance criteria, including equipment selection and slurry mix design may be adjusted in the field to achieve the specified performance criteria.
3. The management of excess swell material (i.e. material above grade) generated by the ISS treatment will be determined in the field. Disposal options include: transporting excess swell material offsite for disposal in a Subtitle D landfill or reusing on-Site below the soil cover system. If reused on Site, all placed excess swell material will have not less than 12 inches of clean soil fill placed over it.

4. A minimum required direct contact barrier of 12 inches of clean soil will be placed in areas that do not meet residential RGOs, however, the soil cover design may be adjusted as future Site development infrastructure including building footprints, foundations, roadways and other like exposure barriers become known. Such exposure barriers would also prevent direct exposure and meet the remedial action objectives for soil.

5.3 OTHER DEVELOPMENT CONSIDERATIONS

Vapor intrusion from groundwater and subsurface soil may a pose a potential future risk to human health if structures are built on portions of the site that are subject to this ROD Amendment. However, it is not possible to fully evaluate potential future risk at this time since ISS in the OIA and additional soil cover may affect the vapor intrusion pathway. A future vapor intrusion evaluation will be conducted under a redeveloped scenario. If that future evaluation finds potential unacceptable human health risk, appropriate ECs (i.e. vapor barriers and other best management practices) will be detailed in the EPA approved Remedial Design Report and construction specifications.

In place land use controls and ICs for the Site will be amended to address future potential land use, consistent with development plans. This is expected to include a Declaration of Covenants and Restrictions that will:

- Prohibit the use of groundwater, and
- Maintain applicable ECs and/or ICs related to the soil cover remedy and any vapor intrusion mitigation measures.

6.0 SUPPORT AGENCY COMMENTS

SC DHEC has reviewed all the documentation supporting this remedy change and concurs with the NAPL/groundwater and soil remediation strategy at the Site. A copy of the SC DHEC concurrence letter is attached in Appendix A.

7.0 STATUTORY DETERMINATIONS

Under CERCLA §121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a 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 reduce the volume, toxicity, or mobility of hazardous wastes as a principal element.

The In-Situ Solidification/Stabilization selected by this ROD Amendment will meet these statutory requirements and satisfies the statutory preference for treatment of the principle threat source material (NAPL) over remedies that reduce toxicity, mobility or volume as a principle element. Through implementation of ISS, COCs are bound into a soil/cement matrix preventing future exposure and minimizing leachability thereby reducing NAPL as a dissolved phase source of contaminants to groundwater. The placement of a minimum of 12 inches of clean soils over applicable areas of the Site prevents direct exposure to potentially impacted surface soils under the residential soil scenario and ensures protection of human health and the environment.

A waiver under CERCLA Section 121(d)(4)(C) for compliance with the MCLs for benzene of 5 ug/L and benzo(a)pyrene of 0.2 ug/L at 40 C.F.R 141.61(a) and (c) (identified as chemical-specific ARARs) for groundwater cleanup is invoked based upon a demonstration of TI. The basis and justification for this TI waiver has been developed in the TIWD that is included in the Administrative Record for this Site. Based upon Site conditions, the past implementation of a pump and treat recovery system and modeling, the EPA has determined that from an engineering perspective the ability of achieving the remedial objective of restoration of the aqueous contaminant plumes to attain the MCLs within a reasonable timeframe throughout the plumes is technically impracticable. The waiver of these ARARs for groundwater cleanup is being invoked for two areas of the Site: 1) a one-acre area of the Northwest Corner; and 2) a 4.5-acre area of the OIA. A waiver of compliance with MCLs in groundwater based technical impracticability is not being granted for the FTA portion of the Site.

8.0 PUBLIC PARTICIPATION COMPLIANCE

The public participation responsibilities set out under Section 117 (a) of CERCLA (Publ. L. No. 96-510) as amended at Pub. L. No. 99-499, and §300.435 (c)(2)(i) of the NCP have been met. Public participation activities prior to the issuance of this ROD amendment included a public meeting on September 28, 2017. Copies of all project documents are available in the Administrative Record File in EPA's Region 4 office in Atlanta Georgia and at the information repositories listed in Subsection 1.3 of this ROD Amendment. The notice of availability of these documents was published in the Post and Courier on September 18, 2017. The public comment period began on September 18, 2017 and concluded on October 17, 2017. Appendix B contains the Responsiveness Summary and transcript of the public meeting.

9.0 REFERENCES

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TABLES

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1a – Location-Specific ARARs and TBCs

Location	Requirement	Prerequisite	Citation
	Floodplains		
Presence of Floodplains designated as such on a map[1]	Shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.	Federal actions that involve potential impacts to, or take place within, floodplains – **TBC**	Executive Order 11988 Section 1. *Floodplain Management*
	Shall consider alternatives to avoid, to the extent possible, adverse effects and incompatible development in the floodplain. Design or modify its action in order to minimize potential harm to or within the floodplain		Executive Order 11988 Section 2(a)(2) *Floodplain Management*
	Where possible, an agency shall use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration.		Executive Order 13690 Section 2(c)
Presence of floodplain designated as such on a map	The Agency shall design or modify its actions so as to minimize[2] harm to or within the floodplain.	Federal actions affecting or affected by Floodplain as defined in 44 C.F.R. § 9.4 – **relevant and appropriate**	44 C.F.R. § 9.11(b)(1) *Mitigation*
	The Agency shall restore and preserve natural and beneficial floodplain values.		44 C.F.R. § 9.11(b)(3) *Mitigation*
	The Agency shall minimize: • Potential harm to lives and the investment at risk from base flood, or in the case of critical actions[3] from the 500-year flood; • Potential adverse impacts that action may have on floodplain values.		44 C.F.R. § 9.11(c)(1) and (3) *Minimization provisions*

ARAR = applicable or relevant and appropriate requirement
C.F.R. = *Code of Federal Regulations*
E.O. = Executive Order
NWP = Nationwide Permit
TBC = To Be Considered [guidance]
U.S.C. = *United States Code*

[1] Under 44 C.F.R. § 9.7 *Determination of proposed action's location*, Paragraph (c) Floodplain determination. One should consult the FEMA Flood Insurance Rate Map (FIRM), the Flood Boundary Floodway Map (FBFM) and the Flood Insurance Study (FIS) to determine if the Agency proposed action is within the base floodplain.
[2] Minimize means to reduce to smallest amount or degree possible. See 44 C.F.R. § 9.4 *Definitions*.
[3] See 44 C.F.R. § 9.4 *Definitions, Critical action*. Critical actions include, but are not limited to, those which create or extend the useful life of structures or facilities such as those that produce, use or store highly volatile, flammable, explosive, toxic or water-reactive materials.

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
General Construction Standards — All Land-disturbing Activities (i.e., excavation, clearing, grading, etc.)			
Managing storm water runoff from land-disturbing activities	Must comply with the substantive requirements for stormwater management and sediment control of *NPDES Construction General (CG) Permit for Stormwater Discharges No. SCR100000, issued under R.122.8 and developed consistent with the conditions in R.61-9.122.41 applicable to all permits.*	Large and small construction activities (as defined in R. 61-9 and SCR100000) of more than 1 acre of land – **applicable**	SCDHEC R. 61-9.122.41 and 122.28(a)(2)(i)
	Coverage under the CG Permit requires development of a stormwater management and sediment control plan which is to be consistent, at a minimum, to the substantive standards listed in SC Regulation 72-300, unless specifically exempted by SC Regulation 72-302.A Note: The stormwater and sediment control plan will be included in an appropriate EPA-approved CERCLA RD/RA document.	Large and small construction activities (as defined in R. 61-9 and SCR100000) of more than 1 acre of land – **TBC**	*NPDES Construction General (CG) Permit for Stormwater Discharges*, Permit No. SCR100000
	The stormwater management and sediment control plan shall contain at a minimum the information provided in the following subsections: • A plan for temporary and permanent vegetative and structural erosion and sediment control measures which specify the erosion and sediment control measures to be used during all phases of the land disturbing activity and a description of their proposed operation; • Provisions for stormwater runoff control during the land disturbing activity and during the life of the facility meeting the peak discharge rate and velocities requirements in subsections (e)1. and (e)2. of this section.	Activities involving more than two (2) acres and less than five (5) acres of actual land disturbance which are not part of a larger common plan of development or sale – **applicable**	SCDHEC R. 72-307I(3)(d) and (e) – *South Carolina Storm Water Management and Sediment Reduction Regulations*
Managing fugitive dust emissions from land disturbing activities	Emissions of fugitive particulate matter shall be controlled in such a manner and to the degree that it does not create an undesirable level of air pollution. Volatile organic compounds shall not be used for dust control purposes. Oil treatment is also prohibited.	Activities that will generate fugitive particulate matter (Statewide) – **applicable**	SCDHEC R. 61-62.6 Section III(a)- *Control of Fugitive Particulate Matter Statewide* SCDHEC R. 61-62.6 Section III(d)

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	Monitoring Well Installation, Operation, and Abandonment		
Installation of Permanent and Temporary Monitoring Wells	All monitoring wells shall be drilled, constructed, maintained, operated, and/or abandoned to ensure that underground sources of drinking water are not contaminated.	Construction of permanent and temporary monitoring wells, as defined in R. 61-71B – **applicable**	SCDHEC R. 61-71H.1(b)
Installation of Permanent Conventionally Installed or Direct Push Monitoring Wells	Wells shall be grouted from the top of the bentonite seal to the land surface. Grout is to be composed of neat cement, a bentonite cement mixture, or high solids sodium bentonite grout.	Construction of permanent conventionally installed or direct push monitoring wells, as defined in R. 61-71B – **applicable**	SCDHEC R. 61-71H.2.a.(1),(2) *[conventionally installed wells]* SCDHEC R. 61-71H.3.b.(1),(2) *[direct push wells]*
	The diameter of the annular space shall be large enough to allow for forced injection of grout through a tremie pipe. All grouting shall be accomplished using forced injection to emplace the grout. When emplacing the grouting material, the tremie pipe shall be lowered to the bottom of the zone to be grouted. The tremie pipe shall be kept full continuously from start to finish of the grouting procedure, with the discharge end of the tremie pipe being continuously submerged in the grout until the zone to be grouted is completely filled.		SCDHEC R. 61-71H.2.a.(3),(4) *[conventionally installed wells]* SCDHEC R. 61-71H.3.b.(3),(4) *[direct push wells]*
	A cement or aggregate reinforced concrete pad at the ground surface of appropriate durability and strength, considering the setting and location of each well, that extends six inches beyond the borehole diameter and six inches below ground surface is required. The pad shall be capable of preventing infiltration between the surface casing and the borehole to the subsurface.		SCDHEC R. 61-71H.2.a.(5) *[conventionally installed wells]* SCDHEC R. 61-71H.3.b.(5) *[direct push wells]*

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
Installation of Permanent Conventionally Installed or Direct Push Monitoring Wells (cont'd)	Well Construction and Materials Standards – (1) Casing shall be of sufficient strength to withstand normal forces encountered during and after well installation and be composed of material so as to minimally affect water quality analyses. (2) Casing shall have a sufficient diameter to provide access for sampling equipment. (3) A properly hydrated bentonite seal with a minimum thickness of twelve inches directly above the filter pack shall be used, if the well has a filter pack. (4) The monitoring well intake or screen design shall minimize formational materials from entering the well. The filter pack 17 shall be utilized opposite the well screen as appropriate in so that parameter analyses will be minimally affected. (5) A locking cap or other security devices to prevent damage and/or vandalism shall be used. (6) Monitoring wells completed below grade shall be in a watertight vault with a well cap to prevent infiltration of surface water into the well.	Construction of permanent conventionally installed or direct push monitoring wells, as defined in R. 61-71B – **applicable**	SCDHEC R. 61-71H.2.b. *[conventionally installed wells]* SCDHEC R. 61-71H.3.c *[direct push wells]*
	All monitoring wells shall be properly labeled with an identification plate immediately upon well completion. The identification plate shall be constructed of a durable, weatherproof, rustproof, material. The identification plate shall be permanently secured to the well casing or enclosure floor around the casing where it is readily visible and shall identify: (1) company name and certification number of the driller who installed the well; (2) date well was completed; (3) total depth (feet); (4) casing depth (feet); (5) screened Interval; (6) designator and/or identification number.		R. 61-71H.2.c. *[conventionally installed wells]* SCDHEC R. 61-71H.3.d *[direct push wells]*
Additional Requirements for Installation of Direct Push Monitoring Wells	Direct push wells cannot be installed below a confining layer unless it can be demonstrated to the satisfaction of the Department that cross-contamination of the aquifer systems can be prevented.	Construction of direct push monitoring wells, as defined in R. 61-71B – **applicable**	R. 61-71H.3.a.

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
Installation of Temporary Monitoring Wells	Construction and Materials – (1) Casing shall be of sufficient strength to withstand normal forces encountered during and after well installation and be 20 composed of material so as to minimally affect water quality analyses. (2) Casing shall have a sufficient diameter to provide access for sampling equipment. (3) The monitoring well intake or screen design shall minimize formational materials from entering the well. The filter pack or intake shall be utilized opposite the well screen as appropriate so that parameter analyses will be minimally affected.	Construction of temporary monitoring wells, as defined in R. 61-71B – **applicable**	SCDHEC R. 61-71H.4.a.
	All temporary monitoring wells shall be sealed with a watertight cap or seal until abandoned. Temporary monitoring wells shall be maintained such that they are not a source or channel of contamination before they are abandoned.	Operation and maintenance of temporary monitoring wells, as defined in R. 61-71B – **applicable**	SCDHEC R. 61-71H.4.b.
Abandonment of Permanent Conventionally Installed Monitoring Wells	Abandonment of permanent conventionally installed monitoring wells shall be by forced injection of grout or pouring through a tremie pipe starting at the bottom of the well and proceeding to the surface in one continuous operation. The well shall be filled with either with neat cement, bentonite-cement, or 20% high solids sodium bentonite grout, from the bottom of the well to the land surface.	Abandonment of permanent conventionally installed monitoring wells – **applicable**	SCDHEC R. 61-71H.2.e.
Abandonment of Permanent Direct Push Monitoring Wells	(1) Permanent direct push wells that do not penetrate a confining layer shall be abandoned by removing all casing from the subsurface and be grouted by forced injection through a tremie pipe from the total depth to the land surface, or by forced injection or pouring of neat cement, bentonite-cement, or 20% high solids sodium bentonite grout through a tremie pipe starting at the bottom of the well and proceeding to the surface. (2) Direct push wells that penetrate a confining layer shall be abandoned by forced injection or pouring of neat cement, bentonite-cement, or 20% high solids sodium bentonite grout through a tremie pipe starting at the bottom of the well and proceeding to the surface in one continuous operation.	Abandonment of permanent direct push monitoring wells, as defined in R.61-71B – **applicable**	SCDHEC R. 61-71H.2.f.

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
Abandonment of Temporary Conventionally Installed or Direct Push Monitoring Wells	(1) All temporary monitoring wells shall be abandoned within 5 days of borehole completion. (2) A conventionally drilled temporary well shall be abandoned by forced injection of neat cement, bentonite-cement, or 20% high solids sodium bentonite grout through a tremie pipe starting at the bottom of the well and proceeding to the surface in one continuous operation. (3) A temporary direct push well that does not penetrate a confining layer shall be abandoned by forced injection of neat cement, bentonite-cement, or 20% high solids sodium bentonite grout through a tremie pipe after the sampling device has been removed. (4) A temporary direct push well that penetrates a confining layer shall be abandoned by forced injection of neat cement, bentonite-cement, or 20% high solids sodium bentonite grout through the sampling device as the sampling device is removed from the sub-surface. Abandonment shall occur during the initial withdrawal from the original push borehole and not by a separate tremie tool after the sampling device has been removed to ensure the breech in the confining layer is permanently sealed.	Abandonment of temporary conventionally installed or direct push monitoring wells, as defined in R.61-71B – **applicable**	SCDHEC R. 61-71H.4.c.
Waste Characterization and Storage ***(e.g., excavated soils, ISS swell material, soil cuttings from well installation, wastewater)***			
Characterization of solid waste	Must determine if solid waste is a hazardous waste using the following method: Should first determine if waste is excluded from regulation under 40 CFR §261.4; and	Generation of solid waste as defined in 40 CFR §261.2 – **applicable**	40 CFR §262.11(a) SCDHEC R. 61-79 §262.11*(a)*
	Must determine if waste is listed as hazardous waste under 40 CFR Part 261.	Generation of solid waste which is not excluded under 40 CFR §261.4(a) – **applicable**	40 CFR §262.11(b) SCDHEC R. 61-79 §262.11*(b)*
	Must determine whether the waste is (characteristic waste) identified in subpart C of 40 CFR Part 261 by either: (1) Testing the waste according to the methods set forth in subpart C of 40 CFR part 261, or according to an equivalent method approved by the Administrator under 40 CFR §260.21; or	Generation of solid waste which is not excluded under 40 CFR §261.4(a) – **applicable**	40 CFR §262.11(c) SCDHEC R. 61-79 §262.11*(c)*

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	(2) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used.		
	Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of solid waste which is determined to be hazardous waste – **applicable**	40 CFR §262.11(d) SCDHEC R. 61-79 §262.11*(d)*
Determinations for management of hazardous waste	Must determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards under 40 CFR 268 *et seq.*. *Note:* This determination may be made concurrently with the hazardous waste determination required in Sec. 262.11 of this chapter.	Generation of hazardous waste for storage, treatment or disposal – **applicable**	40 CFR 268.9(a) SCDHEC R. 61-79 268.9*(a)*
	Must determine the underlying hazardous constituents [as defined in 40 CFR 268.2(i)] in the characteristic waste.	Generation of RCRA characteristic hazardous waste (and is not D001 non-wastewaters treated by CMBST, RORGS, or POLYM of Section 268.42 Table 1) for storage, treatment or disposal – **applicable**	40 CFR 268.9(a) SCDHEC R. 61-79 268.9*(a)*
	Must determine if the hazardous waste meets the treatment standards in 40 CFR 268.40, 268.45, or 268.49 by testing in accordance with prescribed methods or use of generator knowledge of waste. *Note:* This determination can be made concurrently with the hazardous waste determination required in 40 CFR 262.11.	Generation of hazardous waste for storage, treatment or disposal – **applicable**	40 CFR 268.7(a) SCDHEC R. 61-79 268.7*(a)* (1)
Temporary storage of hazardous waste in containers	A generator may accumulate hazardous waste at the facility provided that: • waste is placed in containers that comply with 40 CFR 265.171-173; and • the date upon which accumulation begins is clearly marked and visible for inspection on each container • container is marked with the words "hazardous waste"; or	Accumulation of RCRA hazardous waste on site as defined in 40 CFR 260.10 –**applicable**	40 CFR 262.34(a)(1) and (2) SCDHEC R. 61-79 262.34*(a)* (1) and (2) 40 CFR 264.34(a)(3) SCDHEC R. 61-79 262.34*(a)* (3)
	• container may be marked with other words that identify the contents.	Accumulation of 55 gal. or less of RCRA hazardous waste or 1 quart of	40 CFR 262.34(c)(1) SCDHEC R. 61-79

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
		acutely hazardous waste listed in 261.33(e) at or near any point of generation – **applicable**	262.34*(c)* (1)
Use and management of hazardous waste in containers	If container holding waste is not in good condition (e.g. severe rusting, structural defects), or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers – **applicable**	40 CFR 265.171 SCDHEC R. 61-79 265.171
	Must use a container made or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.		40 CFR 265.172 SCDHEC R. 61-79 265.172
	A container holding hazardous waste must always be closed during storage, except when necessary to add or remove waste. A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.		40 CFR 265.173(a) and (b) SCDHEC R. 61-79 265.173*(a)* and *(b)*
Storage of hazardous waste in container area	Area must have a containment system designed and operated in accordance with 40 CFR 265.175(b).	Storage of RCRA hazardous waste in containers ***with free liquids*** – **applicable**	40 CFR 264.175(a) SCDHEC R. 61-79 264.175*(a)*
	Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or Containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage of RCRA-hazardous waste in containers that ***do not contain free liquids*** (other than F020, F021, F022, F023, F026 and F027) – **applicable**	40 CFR 265.175(c)(1) and (2) SCDHEC R. 61-79 265.175*(c)* (1) and (2)
Closure of RCRA container storage unit	At closure, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soils containing or contaminated with hazardous waste and hazardous waste residues must be decontaminated or removed. [Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate in accordance with 40 CFR 261.3(d) of this chapter that the solid waste removed from the containment system is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable	Storage of RCRA hazardous waste in containers in a unit with a containment system – **applicable**	40 CFR 264.178

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	requirements of parts 262 through 266 of this chapter].		
Temporary on-site storage of remediation waste in staging piles (*e.g.*, excavated soils, ISS swell material)	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.	Accumulation of non-flowing hazardous remediation waste (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)
	May be temporarily stored, (including mixing, sizing, blending or other similar physical operations intended to prepare the wastes for subsequent management or treatment) at a facility if used only during remedial operations provided that the staging pile:		40 C.F.R. § 264.554(a)(1)
	• must facilitate a reliable, effective and protective remedy;		40 C.F.R. § 264.554(d)(1)(i)
	• 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); and		40 C.F.R. § 264.554(d)(1)(ii)
	• must not operate for more than 2 years, except when an operating term extension under 40 CFR 264.554(i) is granted. *Note:* Must measure the 2-year limit (or other operating term specified) from first time remediation waste placed in staging pile. Must not use staging pile longer than the length of time designated by EPA in appropriate decision document		40 C.F.R. § 264.554(d)(1)(iii) 40 C.F.R. § 264.554(i)(1)
	Extension of up to an additional 180 days beyond the operating term limit may be granted provided the continued operation of the staging pile: • Will not pose a threat to human health and the environment; and • Is necessary to ensure timely and efficient implementation of remedial actions at the facility.		40 CFR 264.554(i)(1)(i) and (ii)

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	In setting standards and design criteria, must consider the following factors: • 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.		40 C.F.R. § 264.554(d)(2)(i) –(vi)
	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:	Storage of ignitable or reactive remediation waste in staging pile— **applicable**.	40 C.F.R. §264.554(e)
	The remediation waste no longer meets the definition of ignitable or reactive under 40 CFR 261.21 or 40 CFR 261.23; and You have complied with 40 C.F.R. §264.17(b); or		40 C.F.R. §264.554(e)(1)(i) and (ii)
	Must manage the remediation waste to protect it from exposure to any material or condition that may cause it to ignite or react.		40 C.F.R. §264.554(e)(2)
	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 in – **applicable**	40 C.F.R. § 264.554(f)(1)
	Must separate the incompatible waste or materials, or protect them from on 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)

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
Closure of staging piles 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.	Storage of remediation waste in staging pile in *previously contaminated area* – **applicable**	40 C.F.R. §264.554(j)(1)
	Must decontaminate contaminated sub-soils in a manner that EPA determines will protect human and the environment.		40 C.F.R. §264.554(j)(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 in *uncontaminated area* – **applicable**	40 C.F.R. §264.554(k)
Waste treatment and disposal — contaminated soils, ISS swell material, hazardous waste debris, wastewater			
Disposal of solid waste	Shall ultimately dispose of solid waste at facilities and/or sites permitted or registered by the Department for processing or disposal of that waste stream.	Generation of solid waste intended for off-site disposal – **relevant and appropriate**	SCDHEC R. 61-107.5(D)(3)
Disposal of RCRA-hazardous waste in an *off-site* land-based unit	May be land disposed if it meets the requirements in the table "Treatment Standards for Hazardous Waste" at § 268.40 before land disposal.	Land disposal, as defined in 40 CFR 268.2, of restricted RCRA waste – **applicable**	40 CFR 268.40(a) SCDHEC R. 61-79 §268.40*(a)*
	All underlying hazardous constituents (as defined in 268.2(i)) must meet the Universal Treatment Standards, found in § 268.48, Table Universal Treatment Standards, prior to land disposal as defined in § 268.2(c).	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 – **applicable**	40 CFR 268.40(e) SCDHEC R. 61-79 §268.40*(e)*
	Must be treated according to the alternative treatment standards in 268.49(c) **or** must be treated according to the Universal Treatment Standards (UTS) [specified in 268.48 Table UTS] applicable to the listed and/or characteristic waste contaminating the soil prior to land disposal.	Land disposal, as defined in 40 CFR 268.2, of restricted hazardous soils – **applicable**	40 CFR 268.49(b) SCDHEC R. 61-79 268.49*(b)*
	To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards of 40 CFR 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	Land disposal of RCRA toxicity characteristic wastes (D004-D011) that are newly identified (i.e., wastes or soil identified by the TCLP but not the Extraction Procedure) –	40 CFR 268.34(f) SCDHEC R. 61-79 268.34*(f)*

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	waste extract or waste, or the generator may use knowledge of the waste. If the waste contains constituents (including UHCs in the characteristic wastes) in excess of the applicable UTS levels in 40 CFR 268.48, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.	**applicable**	
Treatment of RCRA *hazardous waste soil* on-site	Prior to land disposal, all "constituents subject to treatment," as defined in 268.49(d), must be treated as follows:	Treatment of restricted hazardous waste soils – **applicable**	40 CFR 268.49(c)(1) SCDHEC R. 61-79 268.49*(c)*(1)
	For non-metals, except carbon disulfide, cyclohexanone, and methanol, treatment must achieve a 90 percent reduction in total constituent concentrations, except as provided in 268.49(c)(1)(C).		40 CFR 268.49(c)(1)(A) SCDHEC R. 61-79 268.49*(c)*(1)(A)
	For metals and carbon disulfide, cyclohexanone, and methanol, treatment must achieve a 90 percent reduction in total constituent concentrations as measure in leachate from the treated media (tested according to TCLP) or 90 percent reduction in total constituent concentrations (when a metal removal technology is used), except as provided in 268.49 (c)(1)(C).		40 CFR 268.49(c)(1)(B) SCDHEC R. 61-79 268.49*(c)*(1)(B)
	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 (UTS) for that constituent, treatment to achieve constituent concentrations less than 10 times the UTS is not required. UTS are identified in 268.48 Table UTS.		40 CFR 268.49(c)(1)(C) SCDHEC R. 61-79 268.49*(c)*(1)(C)
	In addition to the treatment requirement required by paragraph (c)(1) of 268.49, soils must be treated to eliminate these characteristics.	Soils that exhibit the characteristic of ignitability, corrosivity, or reactivity intended for land disposal – **applicable**	40 CFR 268.49(c)(2) SCDHEC R. 61-79 268.49*(c)*(2)
	Provides methods on how to demonstrate compliance with the alternative treatment standards for contaminated soils that will be land disposed.	Treatment of restricted hazardous waste soils – **TBC**	*Guidance on Demonstrating Compliance with LDR Alternative Soil Treatment Standards*, U.S.

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
			EPA 530-R-02-003 (July 2002)
Disposal of RCRA-*hazardous waste debris* in a land-based unit (i.e., landfill)	Must be treated prior to land disposal as provided in §268.45(a)(1)-(5) unless EPA determines under §261.3(f)(2) that the debris is no longer contaminated with hazardous waste or the debris is treated to the waste-specific treatment standard provided in §268.40 for the waste contaminating the debris.	Land disposal, as defined in 40 CFR §268.2, of restricted RCRA hazardous debris – **applicable**	40 CFR 268.45(a) SCDHEC R. 61-79 268.45*(a)*
Disposal of *treated hazardous debris*	Debris treated by one of the specified extraction or destruction technologies on Table 1 (Alternative Treatment Standards for Hazardous Debris) of §268.45 and which no longer exhibits a characteristic of hazardous waste identified under subpart C, part 261, after treatment is not a hazardous waste and need not be managed in RCRA Subtitle C facility. Hazardous debris contaminated with listed waste that is treated by an immobilization technology specified in Table 1 of §268.45 must be managed in a RCRA Subtitle C facility.	Treated debris contaminated with RCRA listed or characteristic waste – **applicable**	40 CFR 268.45(c) SCDHEC R. 61-79 268.45*(c)*
Disposal of *hazardous debris treatment residues*	Except as provided in §268.45(d)(2) and (d)(4), treatment residue must be separated from treated debris using simple physical or mechanical means, and such residues are subject to the waste-specific treatment standards provided in 268.40 for the waste contaminating the debris.	Residue from treatment of hazardous debris – **applicable**	40 CFR §268.45(d)(1) SCDHEC R. 61-79 §268.45*(d)*(1)
Disposal of RCRA wastewaters into CWA wastewater treatment unit	Wastes that are hazardous only because they exhibit a hazardous characteristic, and which are otherwise prohibited under this part, are not prohibited [from land disposal] if the waste meet any of the following criteria, unless the wastes are subject to a specified method of treatment other than DEACT in §268.40, or are D003 reactive cyanide: (i) The wastes are managed in a treatment system which subsequently discharges to waters of the U.S. pursuant to a permit issued under section 402 of the Clean Water Act [SC R.61-9 and R. 61-68]; or (ii) The wastes are treated for purposes of the pretreatment requirements of section 307 of the Clean Water Act [SC R. 61-9 and R.61-68]; or (iii) The wastes are managed in a zero discharge system	Restricted RCRA characteristic hazardous wastewaters managed in a wastewater treatment system —**applicable**	40 CFR §268.1(c)(4) SCDHEC R. 61-79 §268.1(c)(4)

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	engaged in Clean Water Act-equivalent treatment as defined in 268.37(a); and (iv) The wastes no longer exhibit a prohibited characteristic at the point of land disposal (i.e., placement in a surface impoundment).		
Pretreatment standards for discharges into POTW	A user may not introduce into a POTW any pollutants which cause pass through or interference (as defined in 403.3).	Introducing pollutants into POTW (defined in 40 CFR 403.3) by a user whether or not user is subject to other National Pretreatment Standards or national, State, or local pretreatment requirements – **applicable**	40 CFR §403.5(a)(1) SCDHEC R.61-9 §403.5(a)(1)
	The following pollutants shall not be introduced into a POTW: (1) pollutants which create a fire or explosion hazard, including, wastestreams with a closed cup flashpoint of < 140 °F or 60 °C, using test methods specified in 40 CFR 261.21; (2) pollutants which will cause corrosive structural damage, but in no case discharges with pH < 5.0, unless POTW is designed to accommodate such discharges; (3) solid or viscous pollutants in amounts which will cause obstruction to flow resulting in interference; (4) any pollutant, including oxygen demanding pollutants (BOD) released in a discharge at flow rate and/or pollutant concentration which will cause interference; (5) heat in amounts which will inhibit biological activity resulting in interference, but in no case heat in quantities causing temperature at POTW to exceed 40°C (104°F) unless alternate temperature limits approved by POTW; (6) petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through; (7) pollutants which result in presence of toxic gases, vapors, or fumes within POTW in quantity that may cause acute worker health and safety problems; and (8) any trucked or hauled pollutants, except at discharge points designated by the POTW.		40 CFR §403.5(b)(1)–(8) SCDHEC R.61-9 §403.5(b)(1)-(8)

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	Where specific prohibitions or limits on pollutants or pollutant parameters are developed by a POTW in accordance with paragraph (c) above, such limits shall be deemed Pretreatment Standards for the purposes of section 307(d) of CWA.		40 CFR §403.5(d) SCDHEC R.61-9 §403.5(d)
		Transportation of Wastes	
Transportation of hazardous waste *on-site*	The generator manifesting requirements of §262.20 and §262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in §§263.30 and 263.31 in the event of a discharge of hazardous waste on a private or public *right-of-way*.	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**	40 CFR §262.20(f) SCDHEC R. 61-79 §262.20*(f)*
Transportation of hazardous waste *off-site*	Must comply with the generator requirements of §§ 262.20-23 for manifesting, §262.30 for packaging, §262.31 for labeling, § 262.32 for marking, §262.33 for placarding, §§262.40, 262.41(a) for record keeping requirements, and §262.12 to obtain EPA ID number.	Generator who initiates the off-site shipment of RCRA-hazardous waste – **applicable**	40 CFR §262.10(h) SCDHEC R. 61-79 §262.10*(h)*
Transportation of hazardous materials	Shall be subject to and must comply with all applicable provisions of the HMTA and DOT HMR at 49 CFR 171-180.	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**	49 CFR §171.1(c)
Transportation of samples (i.e. solid waste, soils and wastewaters)	Are not subject to any requirements of 40 CFR Parts 261 through 268 or 270 when: • the sample is being transported to a laboratory for the purpose of testing; or • the sample is being transported back to the sample collector after testing. • the sample is being stored by sample collector before transport to a lab for testing.	Samples of solid waste or a sample of water, soil for purpose of conducting testing to determine its characteristics or composition – **applicable**	40 CFR §261.4(d)(1)(i)-(iii) SCDHEC R. 61-79 §261.4*(d)* (1)

Table 3-1
ARARs for the Koppers Superfund Site Amended Remedy
Table 3-1b – Action-Specific ARARs and TBCs

Action	Requirements	Prerequisite	Citation
	In order to qualify for the exemption in 40 CFR 261.4 (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 CFR 261.4(d)(2) 40 CFR 261.4(d)(2) (ii)(A) and (B) SCDHEC R. 61-79 261.4*(d)* (2)(ii)(A) and (B)

ARAR = applicable or relevant and appropriate requirement
CFR = *Code of Federal Regulations*
CWA = Clean Water Act of 1972
DEACT = deactivation
DOT = U.S. Department of Transportation
EPA = U.S. Environmental Protection Agency
HMR = Hazardous Materials Regulations
HMTA = Hazardous Materials Transportation Act
LDR = Land Disposal Restrictions
NPDES = National Pollutant Discharge Elimination System
RCRA = Resource Conservation and Recovery Act of 1976
SCDHEC = South Carolina Department of Health and Environmental Control
TBC = to be considered
TCLP = Toxicity Characteristic Leaching Procedure
UHC = underlying hazardous constituents
UTS = Universal Treatment Standard
WWTU = Waste Water Treatment Unit

Table 4-1

NCP Comparison Summary

Description	Remedial Alternative in 1998 ROD		Recommended Alternative	
	Groundwater: NAPL Recovery System	**Soil:** No action (Maintain existing Engineered Soil Cover system)	**Groundwater:** In-situ Stabilization/ Solidification of NAPL	**Soil:** Surficial Soil Cover
1. Overall Protection of Human Health and the Environment – Assessment of the degree to which the cleanup alterative eliminates, reduces, or controls threats to public health and the 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.	The remedies constructed pursuant to the 1998 ROD are and remain protective under the current non-residential use of the property. Unacceptable risk to human health would not be mitigated for future residential land use scenario.	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.	Protective of receptors. Blocks transport and exposure pathways.
2. Compliance with ARARs – An assessment to determine whether the alternative wll attain applicable or relevant and appropriate requirements under federal environmental laws and state environmental law or facility siting laws or provide grounds for invoking a waiver under NCP 300.430(f)(1)(ii)(C)(3)	Complies with applicable or relevant and appropriate requirements under federal and state environmental laws with waiver of MCL ARAR for benzene and benzo(a)pyrene.	Does not comply with ARARs for future residential land use scenario.	Complies with applicable or relevant and appropriate requirements under federal and state environmental laws with waiver of MCL ARAR for benzene and benzo(a)pyrene.	Complies with applicable or relevant and appropriate requirements under federal and state environmental laws.
3. 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 clean-up goals have been met.	Effective once clean-up goals are met. Demonstrated to be technically impracticable to meet clean up goals.	Not Effective for future residential land use scenario.	Effectively immobilizes NAPL thereby preventing migration and minimizing an ongoing source of groundwater contamination	OM&M required to maintain long term effectiveness.

Table 4-1

NCP Comparison Summary

Description	Remedial Alternative in 1998 ROD		Recommended Alternative	
	Groundwater: NAPL Recovery System	**Soil:** No action (Maintain existing Engineered Soil Cover system)	**Groundwater:** In-situ Stabilization/ Solidification of NAPL	**Soil:** Surficial Soil Cover
4. Reduce Toxicity, Mobility, or Volume Through Treatment – 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.	Reduces mass and volume of NAPL - demonstrated to be technically impracticable to meet clean up goals. Not as effective in reducing mobility as other alternative.	No further change in mobility, toxicity or volume of COCs	Immobilizes NAPL thus preventing mobility. Mass and volume are bound into a soil/cement matrix preventing exposure and leachability.	No change in toxicity or volume of COCs. Reduction in mobility by placement of additional soil cover.
5. 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.	Limited short term impact.	Not Effective for future residential land use scenario.	Effective short term. Immediately effective in blocking exposure pathway.	Effective short term, immediately effective in blocking exposure pathway.
6. Implementability – An assessment of how difficult the cleanup alternative will be to construct and operate, and whether the technology is readily available.	Implementable, straightforward, reliable technology.	Not Applicable	Demonstrated to be implementable in NW Corner area. Proven technology implemented at many creosote NAPL sites.	Straightforward, reliable technology.
7. Cost – A comparison of the costs of each alternative. Includes capital, operations, and maintenance costs.	$1,236,900	Not Applicable	$6,003,000	$11,698,000

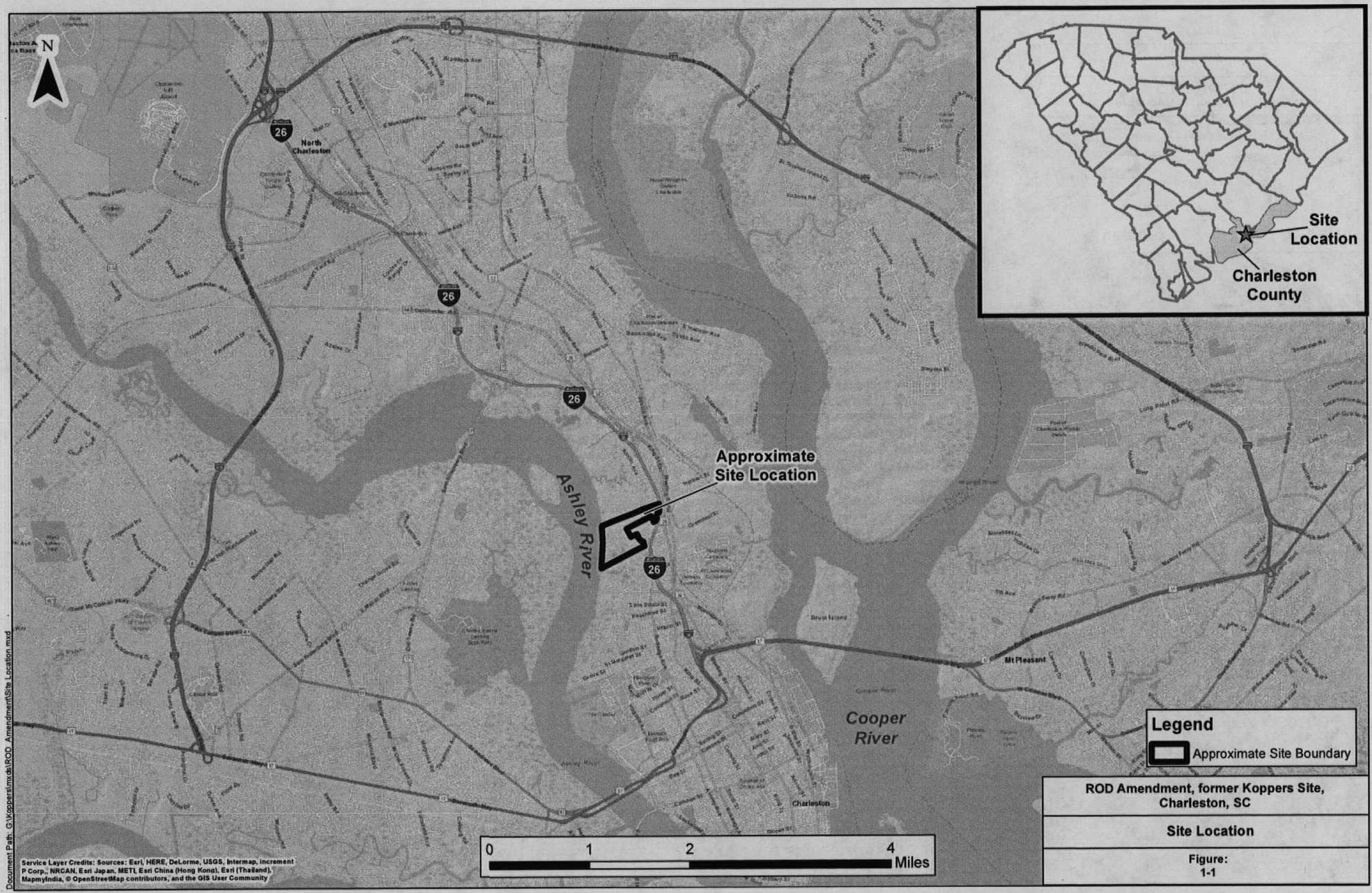
Table 4-1

NCP Comparison Summary

Description	Remedial Alternative in 1998 ROD		Recommended Alternative	
	Groundwater: NAPL Recovery System	**Soil:** No action (Maintain existing Engineered Soil Cover system)	**Groundwater:** In-situ Stabilization/ Solidification of NAPL	**Soil:** Surficial Soil Cover
8. State Agency 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.	Acceptable	Not Applicable	Acceptable; SC DHEC concurs with the remedy.	Acceptable; SC DHEC concurs with the remedy.
9. Community Acceptance – USEPA considers the comments of local residents on the recommended alternative presented in the Proposed Plan and RI/FS Reports.	Acceptable	Not Applicable	Acceptable. Public comments received during the public meeting indicated general support.	Acceptable. Public comments received during the public meeting indicated general support.

Note: this table provides a comparison of the 1998 ROD remedy to the proposed ROD Amendment remedy, in consideration of proposed residential land use scenario.

FIGURES



ROD Amendment, former Koppers Site, Charleston, SC

Site Location

Figure: 1-1


N
FTA
Milford Street
Northern Ditch
Braswell Street Ditch
Central Ditch
Braswell Street
NW Corner
Braswell Street Ditch
Parker Marine
OIA
Barge Canal
South Marsh
0
250
500
Feet
Legend
Ditch
Area to Remain on NPL
Approximate Koppers Site Boundary
ROD Engineered Soil Cover
ROD Amendment, former Koppers Site, Charleston, SC
Site Layout
Figure: 1-2
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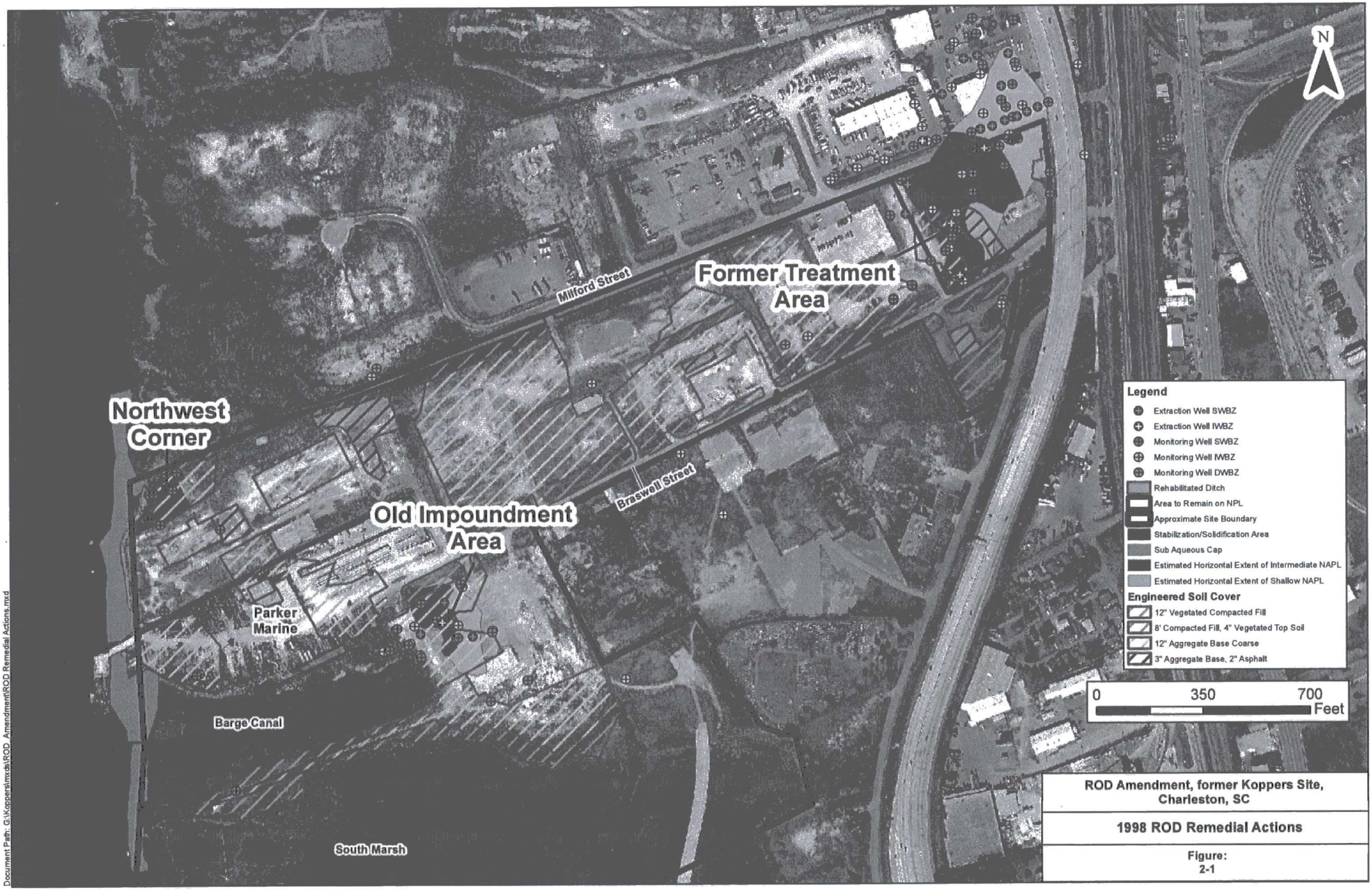

ROD Amendment, former Koppers Site, Charleston, SC

1998 ROD Remedial Actions

Figure: 2-1

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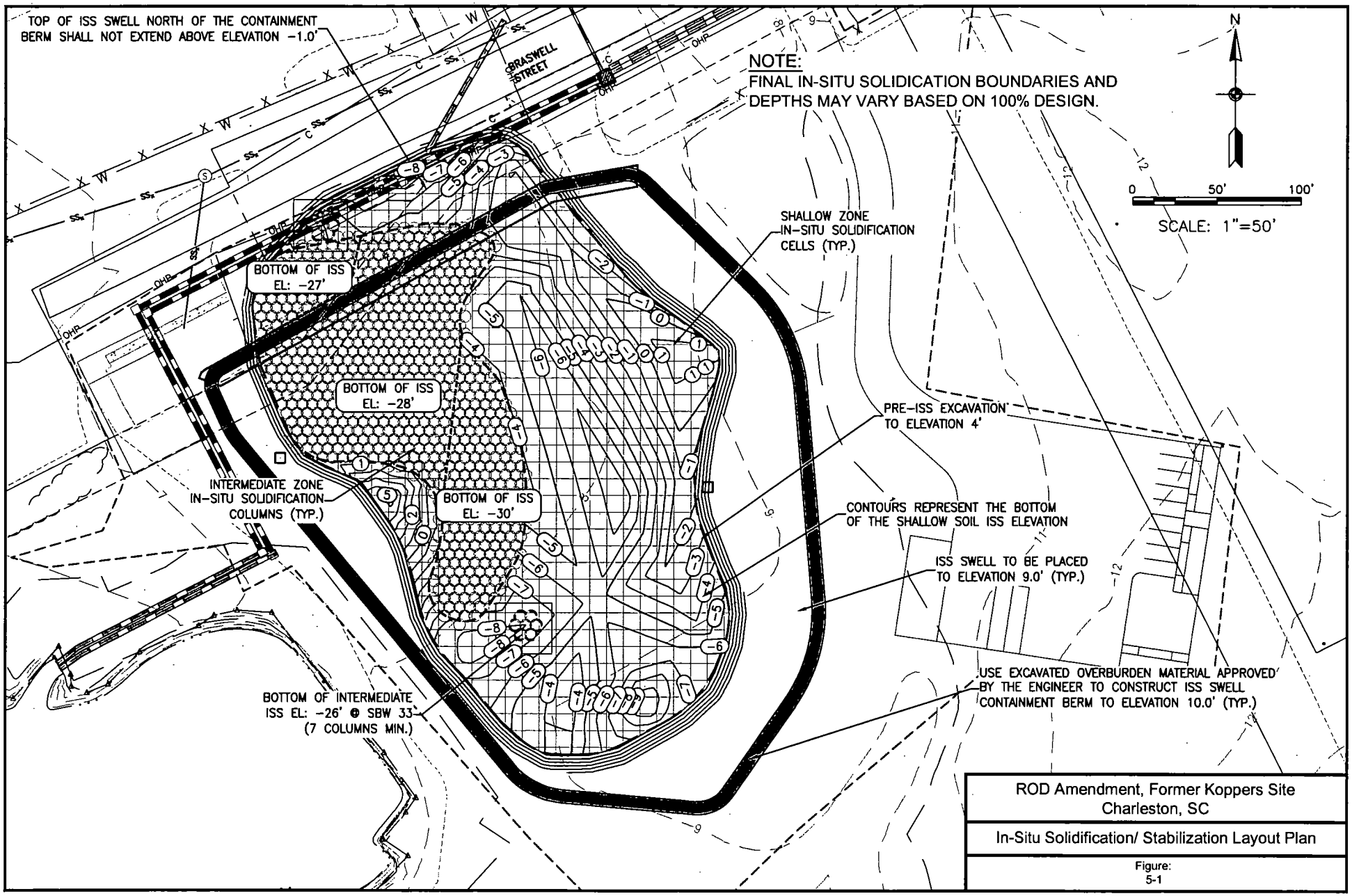
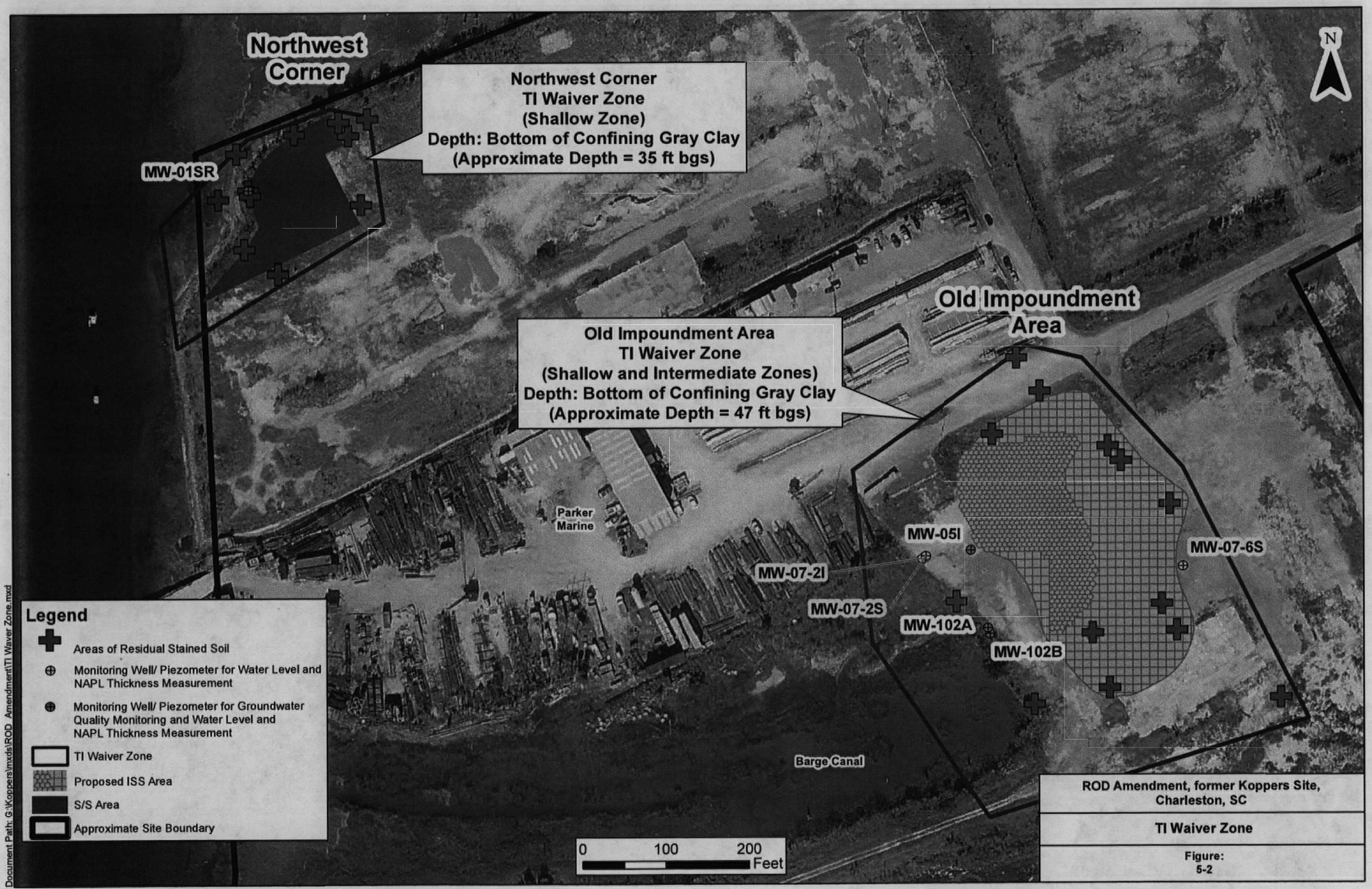


ROD Amendment, Former Koppers Site
Charleston, SC

In-Situ Solidification/ Stabilization Layout Plan

Figure:
5-1


Northwest Corner
Northwest Corner
TI Waiver Zone
(Shallow Zone)
Depth: Bottom of Confining Gray Clay
(Approximate Depth = 35 ft bgs)
MW-01SR
Old Impoundment Area
Old Impoundment Area
TI Waiver Zone
(Shallow and Intermediate Zones)
Depth: Bottom of Confining Gray Clay
(Approximate Depth = 47 ft bgs)
Parker Marine
MW-05I
MW-07-6S
MW-07-2I
MW-07-2S
MW-102A
MW-102B
Barge Canal
N
Legend
Areas of Residual Stained Soil
Monitoring Well/ Piezometer for Water Level and NAPL Thickness Measurement
Monitoring Well/ Piezometer for Groundwater Quality Monitoring and Water Level and NAPL Thickness Measurement
TI Waiver Zone
Proposed ISS Area
S/S Area
Approximate Site Boundary
0
100
200
Feet
ROD Amendment, former Koppers Site, Charleston, SC
TI Waiver Zone
Figure: 5-2
Document Path: G:\Koppers\mxds\ROD Amendment\TI Waiver Zone.mxd


N
FTA
Milford Street
NW Corner
Braswell Street
Parker Marine
OIA
Barge Canal
0
350
700
Feet
Legend
Manhole (Conceptual)
Outfall (Conceptual)
Stormwater Pipe (Conceptual)
Proposed Supplemental Soil Cover
Area to Remain on NPL
Approximate Site Boundary
1998 ROD Engineered Soil Cover
12" Vegetated Compacted Fill
8' Compacted Fill, 4" Vegetated Top Soil
12" Aggregate Base Coarse
3" Aggregate Base, 2" Asphalt
S/S Area (NW Corner)
ROD Amendment, former Koppers Site, Charleston, SC
Sitewide Soil Cover
Figure: 5-3
Document Path: G:\Koppers\mxds\ROD_Amendment\Sitewide_Grading_Plan.mxd

APPENDIX A

STATE CONCURRENCE LETTER

dhec
Healthy People. Healthy Communities.

January 10, 2018

Franklin Hill, Director
Superfund Division
US EPA, Region IV
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Re: Koppers Superfund Site (Charleston Plant)
SCD980310239
Record of Decision Amendment Concurrence Letter

Franklin —

Dear Mr. Hill:

The South Carolina Department of Health and Environmental Control (SCDHEC or Department) has reviewed and concurs with all parts of the Record of Decision (ROD) Amendment dated January 2018 for the Koppers Superfund Site located in Charleston, South Carolina. In concurring with this ROD Amendment, the Department agrees that the Selected Remedy Modifications were chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 United States Code (USC) §9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, as amended.

In accordance with the April 1998 ROD and as later modified by two Explanations of Significant Difference (2001 and 2003), the site-wide remedy was completed in 2003 and consisted of excavation of 22,000 tons of soil with off-site disposal, the 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 (ISS) at the Northwest (NW) Corner, and recovery of groundwater and creosote at the Former Treatment Area (FTA) and the Old Impoundment Area (OIA).

The Koppers Site is part of a mixed-use brownfield redevelopment project, known as Magnolia, which will include commercial/ retail use, office space, residential use, hotel use, and civic and park space. If implemented, the Selected Remedy Modifications will allow for a partial NPL deletion of the site and for future residential use. The proposed changes to the existing remedy are the implementation of ISS of non-aqueous phase liquid (NAPL) in the OIA, installation of a more extensive soil cover over applicable portions of the site, and the replacement or relocation of certain storm water ditches. Further, based on Technical Impracticability (TI) for groundwater restoration, a waiver of maximum contaminant levels (MCLs) as chemical-specific, applicable or relevant and appropriate requirements (ARARs) under CERCLA will be invoked for the OIA and the NW Corner. Given the proposed change from industrial use to mixed commercial/ residential use at the site, the response action selected in the ROD Amendment is necessary to protect the public health and the environment from actual or threatened releases of hazardous substances.

The Selected Remedy Modifications meet the Threshold Criteria and provide the best balance of tradeoffs among the other alternatives with respect to balancing and modifying criteria. The modifications address NAPL and allow for a change in land use from industrial to mixed use with a residential component and are expected to meet the statutory requirements under CERCLA Section 121(b).

The Selected Remedy Modifications for the Koppers Superfund Site are estimated to cost $25-30 million. The major components of this alternative are:

- Changing the remedy for NAPL/groundwater in the OIA from active recovery to ISS of potentially mobile NAPL and contiguous areas of residual NAPL.
- Placement of a 12-inch thick clean soil layer over applicable portions of the site to support a change in intended future land use from industrial to mixed use with residential component.
- Replacing or relocating certain storm water ditches with storm water conveyance piping to enhance the effectiveness and permanence of the storm water remedy under the intended future land use.
- Waiving compliance with the MCLs for benzene and benzo(a)pyrene that were identified in the 1998 ROD as chemical-specific ARARs and that were used for the basis of the groundwater cleanup levels. The waiver, pursuant to CERCLA Section 121(d)(4)(C), is due to technical impracticability from an engineering perspective and from site-specific conditions. Two separate TI waiver zones [a 4.5-acre TI zone for the OIA, and a one-acre TI zone for the Northwest Corner] define the spatial extent where compliance with the MCLs will be waived.

- Land use controls and Institutional Controls (ICs) are in place for some site parcels. Amendment of these controls will be necessary for future development and will include a Declaration of Covenants and Restrictions that will prohibit the use of groundwater and maintain applicable engineering controls and ICs related to the soil cover remedy.

SCDHEC agrees that the Selected Remedy Modifications presented in the ROD Amendment are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

If you should have any questions regarding the Department's concurrence with the ROD Amendment, please contact Joel Padgett at (803) 898-0832.

Sincerely,

Daphne G. Neel, Chief
Bureau of Land and Waste Management

Cc: Don Siron, BLWM
Ken Taylor, BLWM
Susan Fulmer, BLWM
Joel Padgett, BLWM
Craig Zeller, EPA
Christine Coker-Sanford, EA Lowcountry Charleston
File # 51717

APPENDIX B

RESPONSIVENESS SUMMARY/PUBLIC MEETING TRANSCRIPT

APPENDIX B

RESPONSIVENESS SUMMARY
for
Record of Decision Amendment
Koppers Co., Inc. (Charleston Plant) Superfund Site
Charleston, Charleston County, South Carolina

The Responsiveness Summary is required by Section 117 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, more commonly known as Superfund) and Sections 300.430(f)(3)(i)(F) and 300.430(f)(5)(iii)(B) of the National Contingency Plan (NCP). This document provides a summary of comments received from the public during the 30-day comment period. It also documents for the record how public comments were integrated into the remedy decision-making process for the Koppers site.

EPA released the Proposed Plan for a Record of Decision Amendment to the public the week of September 11, 2017 and held the 30-day public comment period from September 18 through October 17, 2017. A press release announcing the 30-day public comment period and availability of the Proposed Plan was issued by the EPA Region 4 Office of External Affairs on September 18, 2017. In advance of the comment period, a Fact Sheet was mailed to over 600 individuals on the site mailing list to provide a summary of technical and legal information found in the Proposed Plan. An announcement of the Proposed Plan availability, location of the Proposed Plan/supporting documentation and date/location of the public meeting was also published in the Charleston Post & Courier newspaper on September 18, 2017.

EPA sponsored a public meeting on September 28, 2017 at the Charleston Longshoremen's Association to present the details of the Proposed Plan. The meeting started just after 6:00pm and concluded at approximately 6:41pm. About a dozen people attended the public meeting. The verbatim transcript of the September 28th public meeting is attached to this Responsiveness Summary.

During the 30-day period, only one public comment was submitted to Craig Zeller, EPA's Remedial Project Manager (RPM) in the Region 4 Superfund Division. This comment was received from an individual with a Rosemont address. This individual posed four questions that were listed on the public comment sheet (attached). The four questions, and EPA's answer to each are provided below.

Question 1: What impact will the replacement of existing drainage ditches with a subterranean storm sewer have on the Rosemont Community? Rosemont Community is currently a low area. Will "consistent with future use" have a negative impact in the community?

Answer: The permanent subterranean storm sewer will be designed and constructed in accordance with local regulations/ordinances and will be coordinated with the Ocean and Coastal Resources Management office of South Carolina Department of Health and Environmental Control (SCDHEC). The new subsurface sewer system will replace portions of the existing

network of open drainage ditches, so the new system should enhance and improve drainage characteristics in the project area.

Question 2: What will be the egress routes used to remove soil to support land use changes?

Answer: This project will be a "net-fill". However limited amounts of soil are anticipated to be removed as part of development. This will involve trucking in dirt for the additional cap that will increase the site elevation at least 12 inches. Braswell and Milford Streets will likely be the primary access roads for truck traffic.

Question 3: Will appropriate monitoring stations be installed to monitor creosote in the subsurface that may become air borne?

Answer: The In-Situ Stabilization work in the Old Impoundment Area will involve mixing re-agents with subsurface creosote. Appropriate air monitoring will be conducted during this work to ensure adequate protection of site workers, and the adjacent business (Parker Marine).

Question 4: Will a special fund be available for immediate and possible harm now in the future for residents of Rosemont Community?

Answer: No harm of the Rosemont Community is anticipated now or in the future. As part of the re-zoning process for the Magnolia development, the City of Charleston has passed a Tax Increment Funding (TIF). Under the TIF, the increased tax revenues generated from the development will be invested into public infrastructure, including parks.

Koppers Co., Inc. (Charleston Plant) Site
PUBLIC COMMENT SHEET

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Koppers Co., Inc. (Charleston Plant) Superfund Site is important in helping EPA select a remedy for the Site. You may use the space below to write your comments, then fold and mail. A response to your comment will be included in the Responsiveness Summary.

1. What impact will the replacement of existing drainage ditches with a subterranean storm sewer system have on the Rosemont Community? Rosemont Community is currently a low area, will "consistent with future use" have a negative impact in the community.

2. What will be the egress routes used to remove soil to support land use changes?

3. Will appropriate monitoring station be installed to monitor creosote subsurfaces that may become air borne?

4. Will a specific fund be available for immediate and possible harm now and in the future for residents of Rosemont Community?

ENVIRONMENTAL PROTECTION AGENCY
ATLANTA FEDERAL CENTER

PUBLIC MEETING RE: KOPPERS COMPANY CHARLESTON PLANT

Location: Charleston Longshoremen's Association
1142 Morrison Drive
Charleston, South Carolina

ORIGINAL

TRANSCRIPT OF
PUBLIC MEETING

DATE: September 28, 2017

TIME: 6:00 p.m. - 6:41 p.m.

REPORTED BY: Lorraine A. Wharton

HUSEBY FILE #178401

A-P-P-E-A-R-A-N-C-E-S

For the Environmental Protection Agency:

By: Craig Zeller
EPA Remedial Project Manager
U.S. EPA, Region 4
Superfund Division
61 Forsyth Street, SW, 11th Floor
Atlanta, GA 30303
(404) 562-8463
zeller.craig@epa.gov

L'Tonya Spencer
EPA Community Involvement Coordinator
61 Forsyth Street, SW
Atlanta, GA 30303-3104
(404) 562-8463
spencer.latonya@epa.gov

INDEX

PROCEEDINGS

Introductory Remarks by Ms. Spencer

MS. SPENCER: Good evening, everybody. I want to go ahead and get started. If everybody could find a seat. You don't have to sit so far back. Come up and get a little closer, if you'd like. Craig won't bite.

My name is L'Tonya Spencer. I'm the Community Involvement Coordinator for the Koppers site that we'll be talking about on tonight, and I'm going to do some introductions and a little bit of housekeeping. The first thing I want to do is just some introductions.

I introduced myself. I'm with EPA. And we have Craig Zeller who is the Project Manager for the site. And I know we have several representatives from the State, if you guys want to stand and introduce yourselves?

Okay. They want to just wait. So we have several representatives from the State that are here. Do we have any local or government representatives here? Out of Charleston. Okay. Are there any representatives from any community groups represented here tonight? State your name. [Unintelligible] from Ladson. Okay.

For those who need to know, the restrooms are right out here to your right side. So if anybody has to

go, you don't have to raise your hand or anything. You can just go to the restroom and come right on back.

Tonight we're going to be talking specifically about the proposed plan for the Koppers Charleston site. As a part of our proposed plan, there's a common period for this.

We do have a transcriptionist here, so what we're going to ask you to do is wait until Craig completes his presentation and then we'll have a question and answer session.

During that question and answer session, if you will come to this mic, state your name, spell it if it's different to make sure they'll get it on record, and then make your comment or ask your question. We're asking that only one person talk at a time to make sure that we get everybody's comments and questions on record.

Now with that, I'll turn it over to Craig.

Presentation by Craig Zeller

MR. ZELLER: Okay. Good afternoon -- or good evening. Thank you for coming. My name is Craig Zeller. I'm a Project Manager with the Environmental Protection Agency out of the Atlanta office. We're here tonight to talk about some proposed clean-up actions that we want to implement and are proposing to implement on a Superfund site known as the Koppers Company, Inc.

Page 6

site.

So what we're going to do is I'm going to give you just a little background of what we've been doing with this facility for the last, say, 20 years or more, what we -- some of the previous clean-up actions that we completed in around 2003, talk a little bit about the Magnolia project which this -- this proposed clean-up action is actually kind of directly related to, to facilitate that project moving forward, talk in a little more specifics about the actual clean-up actions that we were proposed to -- with this $30 million dollar proposed plan that's on the street right now. Kind of go over, briefly, the schedule, and then, as L'Tonya said, to kind of open it up for Q and A.

So I only have about I guess 15 slides total, so I'll just try and keep moving here.

So we're talking about the Koppers site which is a former wood treater, roughly represents about 102 acres. It actually sits on the Ashley River up here in the area we call "the Neck." It's generally bounded on the south by Braswell Street, on the north by Milford Street, on the west by the Ashley River, and on the east by the King Street Extension.

So a little bit about what -- what did they do. Well, Koppers was a wood treater; right? We -- what

Page 7

they did was pretty much treat railroad ties, crossties -- and railroad ties -- pilings for marine use, as well as electrical power poles. Creosote was an algicide. When you pump this stuff into the wood, it would actually kill the bugs that actually decay the wood so that you would get longer use out of it.

This is what the property looked like when we kind of got started on it, looking from the Ashley River into -- this was the main area of where -- about a 45-acre parcel that was used for the wood treating facility, and there's another 57 acres or so that sits over here. We'll talk about this barge canal a little bit later. But that's a view, kind of looking east.

So they're a wood treater, primarily in operation from around 1940 to 1978 when the operation ceased and the property then began to be split up into a bunch of different parcels.

As I mentioned, creosote was the primary preservative. If you know railroad ties and all, that's kind of the black sticky stuff that oozes out of these railroad ties, kind of smells like mothballs. That was the primary preservative they used. They did use, for short periods of time, what was known as pentachlorophenol, or PCP, and they also used a copper chromium arsenate solution which is kind of the current

Page 8

stuff we use which is that -- that greenish wood treatment that you see on treated wood at, say, Home Depot and Lowe's.

We first got started on this site, started looking at it with our State counterparts in Columbia, probably in the late '80s, early '90s. We did some investigations and found that it qualified for inclusion on the National Priorities List. A common term of that -- for that term would be "the Superfund list." All right?

So we proposed that in 1992. Two years later it became final, and that set in motion about ten years of environmental investigations, risk assessments, and, ultimately, the site-wide clean-up that was completed in nine -- in 2003.

It's important to note that all the clean-up work that's been done to date, all the investigations, all the clean-up work, has been paid for by industry. All right? The company that picked up the liability of this corporation, Koppers, is known as Beazer East. Their headquarters here in the United States is out of Pittsburgh. And we've worked with them, with our state counterparts, over, really, the last two decades, and they have paid for all of this work so far.

As I mentioned, that clean-up was completed

Page 9

in 2003. It involved a little bit of everything. It was cleaned up to industrial standards because, at that time in 2003, that was the predominant land use in that area, and that property at that time was zoned for industrial land use, which is why we cleaned it up to those industrial standards.

The remedy value, in 2003, was about $20 million dollars. At that time, that was -- you know, a pretty expensive remedy.

And then we proceeded on with recovery of creosote that was in the subsurface at two areas. And we talk about -- I'll show you where those are at in a minute.

We are currently recovering free product from the former treatment area on the east, and we're recovering free product in the old impoundment area closer to the river.

Over the course of about, what, 14 years, we've recovered just over -- what is that -- about 34,000 gallons of creosote from both areas. And, in doing so, on that annual cost we've been -- Beazer has been expending about $200,000 to $250,000 a year in annual operation and maintenance cost to make sure that remedy remains protective of human health and the environment.

So this is kind of our Koppers site, right

Page 10

through here, and these are the areas where we have residual creosote in the subsurface that we are currently recovering with extraction wells. This is the forward treatment area, the bigger of the two source areas. This plume kind of wants to migrate towards Haygood. But that is the -- kind of the current shape of that plume in this area.

And this is the old -- the old impoundment area. It's a much smaller area, that we've gotten about 14,000 gallons of that material out of.

And then this area is the northwest corner. At one point in time, in the early states of this investigation, it was thought that we might recover some free product out of that area. After looking at further borings in the subsurface, we decided that it really wasn't worth it so we actually mixed that material up with some Portland cement and bentonite, a treatment technology that I'll talk about later.

It's called in situ stabilization and sclidification, and the concept is there where you -- we mix that residual material with some Portland cement and bentonite and form a like chunk or a monolith, if you will, one big lump, that -- that sits there and does not leach. All right? We can -- we do kind of a source containment on it, a source treatment on it, so it won't

Page 11

leach through the underlying ground water and then, subsequently, won't migrate off site. In this case, we were worried about the Ashley River.

So there's where our residual creosote areas are, what we've been focused on since about 2003.

Okay. So Koppers sits right in the middle of this footprint, the redevelopment -- mixed use development known as Magnolia. And these are the three sites kind of at play. You can see the -- all the shaded property here represents 200, 220 acres or so of land that has been the focus of redevelopment issues of interest for quite some time now.

In the early 2000s, there was an outfit that we kind of call now Magnolia Version 1.0, started assembling all these projects and assembling all these properties. They had worked with the state of South Carolina to go through kind of their voluntary clean-up program to make sure all the boxes were checked and so that they could get their liability protection that's afforded in that program.

The City of Charleston was very supportive of the project. They floated some municipal bonds, I think to the tune of about $10 million dollars, to build the new entrance bridge that was going to actually lead into the development, came off of Herriot Street. They also

Page 12

went out and passed some tax increment funding through the Council, that any increased tax revenue from this development then would go into public infrastructure including parks. All right? So there's a lot of momentum getting steam here like about mid 2000s for Magnolia Version 1.0.

And then something bad hit. The American economy -- the great recession hit in 2009, and these properties fell into bankrupt -- bankruptcy status because of defaults on loans. They weren't the only people that happened to in 2009.

Well, Magnolia is finally moving forward again. We had to wait for the -- this project was kind of put on ice, and wait for the economy to recover. It took several years for the economy to kind of spin around. But there was an interest in this kind of land use again.

And it took a little while for these properties to move through bankruptcy court. That usually takes, you know, a couple years for the dust to clear on that. Well, we've had a lot of movement here recently with regard to bankruptcy court, particularly last week. You may have read in the Post & Courier that the site on the north of us, Columbia Nitrogen, was purchased out of bankruptcy court.

Page 13

And now, for the first time, all these properties are kind of being put back together. All right? They all back together in '08, '09. The great recession happened. Bankruptcy's happened. It's taken, you know, a good number of years to get them all back, get them free, you know, of some of these liens and everything else, so that they can now reassemble the Version 1.0 footprint and start Version 2.0 as if this -- the recession never happened.

All right. So now a big part of this Magnolia development is trying to get Koppers off the National Priorities List. Why is that important? Well, developers don't really like to buy Superfund sites. They're worried about liability. Okay?

One way to guard against liability is to enter into these voluntary clean-up contracts with the South Carolina Department of Health and Environment Control to provide you some liability protection from some of these lawsuits that can kind of set the momentum out of these development projects.

So that's important, and it's important for us to get off the National Priorities List because of a requirement of the State VCP Program, that you can't come into the VCP Program if you're an NPL site. All right? So you have to have -- be off it first, before you can

Page 14

get in it. Also, I think by taking it off the NPL, the financing probably gets a little better. Lenders are a little less anxious when lending money on stuff that's not on the Superfund list. Okay?

Now what this group of developers that we've been working with for a number of years, really, kind of starting as early as '13 when we started to kind of turn the corner here on Version 1.0 and started talking about Version 2.0, they've come to us and said, EPA, you've cleaned it up to industrial standards. We have five-year reviews where we continue to evaluate the protectiveness of that remedy. And it's protected under the current industrial land use; we have no problems with the protectiveness of that remedy.

But the new group of investors that are looking to buy this want to take this up to the highest and best use, and they're -- with a residential component. It has been rezoned by the City of Charleston for this mixed use. That includes residential.

So more clean-up is needed to upgrade the industrial scenario, the industrial land use, and take that up to the residential land use.

So all of this work that we're going to talk about here in a minute is going to be paid for and conducted by this group of developers. There will be no

Page 15

taxpayer money go to this thing. This is 100 percent paid for by third-party money.

And it's -- also put a note, this is not the responsible party. This is not Beazer. Beazer's A-okay with that industrial clean-up and they -- they're not interested in paying $30 million dollars so somebody else can go put houses on it. Okay? So this is paid for 100 percent by third parties.

Now EPA, myself and my -- our colleagues at the State of South Carolina, will oversee this work to make sure it's done in compliance with the design drawings and stuff that -- that we approved prior to the Rick study. And then once all that work is done, it will then qualify for deletion from the NPL.

And we're going to delete all of the parcels from the Koppers site except the former treatment area. So this area's going to stay on the NPL and we're not proposing to do any additional clean-up on that. All right? So once this $30 million dollars' worth of work is done, EPA will then move to delete that section from the NPL and then the development would go -- proceed forward.

So let's talk about what we're talk -- we're proposing to do, the $30 million dollars in additional clean-up work. What -- what actually is that?

Page 16

So again, as I mentioned, this is -- this clean-up work, the overall goal of this, is to upgrade this clean-up from its current industrial land use to the new expected use which is going to be mixed use with residential.

And so the remedy is kind of split up into three general components. The first one is we're going to do some additional treatment of that old impoundment area. We're going to apply the same technology, this in situ stabilization and solidification that worked successfully for the northwest corner. That was done in 2003. And we've got a lot of monitoring data to show that it has been effective over that period of time.

So we're going to apply that same technology that's worked on site to a different area called this old impoundment area that is going to replace -- once we mix that up with concrete and bentonite, we will no longer be able to recover free product from that, nor would we want to. Again, we're -- we're doing this treatment, this source zone treatment, to stop the leaching and to mitigate any offside transport to the barge canal, Ashley River or into the -- just downgrading ground water.

We're then going to bring in a new cover. There is an existing cap on site that's protective of industrial land uses. This is going to be a net fill.

Page 17

So we're going to bring in, and the developer's going to bring in, a bunch of new net fill and we're going to bring the entire footprint up 12 inches to 18 inches. Part of that is to get it out of the flood plain; part of that is to be a nice subgrade for the permanent hardscape that will be part of this development such as parking lots, such as parking garages, building foundations, park areas. All right? So we're going to take that existing ground surface and the whole thing's coming up, net fill. All right? No cut. One hundred percent fill.

And then the third and final component that we're proposing to do for the $30 million dollars is the existing drainage network that was put out there was put out there in accordance with local standards, working with OCRM, for the ten-year, 24-hour storm, under an industrial land use. All right?

And what we have, basically, out there, is -- is an open network of drainage swales or ditches. All right? Basically, just open ditches to design -- or to handle the designed storm. So as part of this development, like any other residential or, say, commercial kind of development project, it's going to be replaced with a permanent subterranean storm sewer system, reinforced concrete by the culverts and the drains that you'd see in everyday shopping malls and that

Page 18

kind of thing. All right?

So it's three parts. It's in situ stabilization in the old impoundment area, a net fill over the entire site, and then replacing of existing ditches with the new ditches, the subterranean, more permanent ones.

Let's talk a little about -- drill down just a little bit, talk a little bit more about the specifics of this in situ stabilization.

So this is the area that we're going to be mixing. It's a total of about 1.5 acres in area. And the volume of this thing is about 55,000 cubic yards. Okay? One cubic yard is a box -- think of a box that's three foot -- three foot by three foot. That would be one cubic yard.

And so there will be 55,000. That's a pretty -- pretty good-sized volume. It's really a relatively small size and area, but we have to go down about 35 feet, so that's where we pick up that volume. Okay?

Now the upper 15 feet, we're going to mix in -- we're going to design a recipe. Kind of think of it as a cookie batter. And this recipe is going to be designed to resist leaching and prevent migration of this residual creosote off the property. All right? So it's going to be a little bit of bentonite, which is clay, and

Page 19

it's going to be a little bit of Portland cement, which is concrete, to bind that stuff up and make it real hard.

Then we're going to mix in that -- that recipe, in the upper 15 feet or so, the shallow layer. We're going to blend that in with a -- with a big like rotary blender, basically -- probably a large track excavator with some sort of device on the bottom that mixes this thing up and then blends in our recipe.

Now for those deeper zones that we can't get with a -- just a typical excavator, we'll likely introduce that recipe by deep augers. Think of big drill bits where we'll spin down to the desired depth where we want that treatment zone, and then, as we pull that -- that tool out of the ground, we'll re-inject -- we'll pressure-grout something in there with that recipe and -- and spin it in with big augers down to those deeper zones. Okay?

The work on this -- of the $30 million, this constitutes around $7, $8 million of that work. Okay? So it will be a third of what we're talking about.

Now we've been trying to -- in order for us to delete a site from the NPL, we either go to meet the clean-up goals -- and groundwater, in this case -- or somehow decide to waive them with some administrative procedure.

Page 20

Well, where groundwater restoration is unattainable, where our engineering technologies can't reach those -- drinking water standards, in this case -- we do have the ability, through our Superfund, to actually issue -- to waive those. And so we're waiving those requirements because it's technically impractical. I don't have an engineering technology -- or a pollution prevention technology that can actually get me to drinking water concentrations, where I have residual creosote in the ground.

So now we looked at a T.I. waiver and then -- and to demonstrate that that was technically impractical, for just two areas on site, the old impoundment area and the northwest corner. We did not look at applying a T.I. waiver to the former treatment area. Again, we're not proposing to delete that from the -- the NPL, and we're not proposing to do any additional treatment on that former treatment area, just the old impoundment area.

But we looked at, you know, what can we do with some of these areas? And no matter what we throw at this, technology-wise, staying status quo, which is the pump-and-treat remedy, or mixing the stuff with -- via in situ stabilization, we're going to have some areas above these drinking water standards for 80 to 100 years, no matter how much money we throw at this thing.

Page 21

So that's -- that's a lengthy restoration timeframe. And so as part of this decision, what we're proposing to do, then, is issue a -- a T.I. waiver for those groundwater/drinking water standards for about 5.5 acres total of the 102-acre site. That's 4.5 acres in the old impoundment area and 1.0 acres in the northwest corner, which represents just about five percent of that entire footprint of the Koppers site.

These are the T.I. waiver zones that drinking water standards will no longer apply. This is the one acre in the northwest corner. This is 4.5 acres here in the old impoundment.

It's important to note that the State of South Carolina, as well as EPA, kind of classify this groundwater aquifer here in this area of Charleston as a potential drinking water source. It's not an actual. No one's getting their drinking water from this. Of course, the City of Charleston provides the drinking water here locally which is treated and it's not a -- it's not a groundwater source.

But we always classify this stuff as a potential. That's why drinking water standards here kind of apply, because we always -- we want to apply the highest and most protective standards. But no one's ever going to drink this water; no one ever has. And we'll

Page 22

make sure, actually, to put controls on that to make sure that the groundwater use in this area, for another line of protection, is -- is never used.

Here's a brief picture. Almost done; just got a couple more slides. Here's a brief picture of the bentonite fill. This is the area in brown here that's going to get 12 inches to 18 inches of fill, to bring all that up. The little blue lines are, at this point in time, kind of a conceptual layout of the storm water network. Of course, that's going to likely change as we get into more detailed designs.

It's important to note that these developers have options to purchase most all of this property except this little -- little limited wedge that is currently owned by Parker Marine. They have, I guess, the manufacturing piles over there, prestressed concrete piles for use in the marine industry, for a period of time, and they're still operational. So how Mr. Parker gets kind of integrated and into this whole new neighborhood, I guess, we're still kind of working some of that stuff out.

All right. Last slide scheduled, then we'll -- I'll stop talking and I'll open it up for questions and answers.

Just a little bit about schedule. As L'Tonya

Page 23

mentioned at the start of this, this is -- this is decision-making at the federal government, so we're required to hold three public comment periods to give y'all an opportunity to weigh in. This is why we have the court reporter here tonight, and we also -- that's also a legal requirement: To make sure that we have a court transcript of what was said here tonight.

So we started the public comment -- the 30-day public comment period for this proposed plan started on the 18th of September. It's going to run through the 17th of October. Okay?

We're also required, during that 30-day comment period -- we typically like to kind of get it at the front side or usually in the middle of that 30-day comment period, to have a public meeting. So that's why I'm standing here talking to y'all tonight, to make sure we fill -- fulfill our legal requirements.

Please, on those comments, submit those to me, zeller.craig@epa.gov -- and I'll give that to you. I have a card; I can give that to you guys later. And it's in some of our -- our handouts at the front, as well. Please get those postmarked, submitted to me by noon -- or, excuse me -- midnight on the 17th, and they'll become part of the record.

We wrap all this stuff up. At this point in

Page 24

time, it's a proposal. We take into account and -- and -- and fully read and consider all the comments we received on the proposal, and then we wrap that up in a -- in a final decision document that's called a Record of Decision.

Now sometimes that Record of Decision is different: It would be based on comments we receive from the State counterparts, from our citizens. We oftentimes make modifications, tweak through those remedies, to make sure that we address folks' concerns.

We hope to have that decision document out and final by the end of this year, kind of the plan is December of -- of this year. And then we're going to spend most of -- most, if not all -- probably all -- of 2008 [sic], doing this clean-up work. Okay?

The ISS work's going to take, you know, a good half a year to get completed. We've got to bring in a lot of fill. This is a big footprint. There's going to be a lot of trucks bringing in clays and topsoils and stuff for this -- for this net fill and to get all that infrastructure down. And for the storm water network, it's going to take, you know, probably into towards 2019, depending on how things go.

After that clean-up work is done, we will then move to put into -- delete that -- that section from

Page 25

the National Priorities List, after which time the group of developers can enter into the State Voluntary Clean-Up Program and get their third-party liability -- liability protection, and then everything else can proceed from there. Okay?

So Magnolia, the actual concept of Magnolia, probably won't rise from the ground until, at the earliest, of 2019. All right? We've got about a year of work here we've got to kind of get done and get out of the way so this process can proceed forward. Okay?

One other thing on that is that this group of developers actually owns that Ashepoo Trap outright, now. That's where the new bridge that comes in off of Herriot Street, that -- that initial little rotary traffic circle, that is the Ashepoo property. I believe it's on the order of 20 -- 20-ish acres.

And once some of this smoke -- there's maybe a little clarity over the -- yeah, after all these years of work, this thing is, in fact, going to move forward, it's possible that this group of developers could actually get started on that Ashepoo tract while we get some of this other work done. All right? Because that's -- that would be the legit -- the logical place to start. That's where the bridge dumps into the property. That's where the first traffic circle is going to be. So that

Page 26

would be an -- an obvious place to start, so.
That is my last slide. I can talk a little faster, if I missed something and there's something you would like to hear more about. I'm, obviously, going to be here until the questions stop. Please send your comments to that email address. You may also submit them in writing, if you -- you do so, if you care to do so. I have a card, again, with my physical address; you may mail those to me, as well. We'll take snail mails.
Of course, if you have any community, more -- more community-centric questions, please work with L'Tonya on that. She helps me out with all the community concerns and interests. And make sure that we actively engage y'all and get -- you know, get you very clear on what we are trying to talk about and propose here tonight, so.
With that, I think we want to go to questions.

Question-and-Answer Session

MS. SPENCER: We are -- we're going to start the question and answer portion. I know Craig presented a lot of information in a very short period of time and very fast. So just in case you didn't catch everything, if you need some clarification, the Fact Sheets are on the back table and there's a URL to a web site and it

Page 27

actually has the whole proposed plan which is about 11 or 12 pages, if you want to read through that to get the details of what Craig talked about.
I will also get this presentation from Craig and upload it on the web site when we get back to the office, so it should be up probably Monday or Tuesday.
And, in addition, if you don't get an opportunity or you think of something when you get home, take one of those fact sheets. There's a Comment page on there. And all you have to fold -- all you have to do is fold it and put a stamp on it and mail it back to Craig, to make sure we've got your comments.
If you have any comments, questions or suggestions on tonight, please come to the mic and state your name. If it's a difficult name, please spell it so our transcriptionist can get your information.
Any questions?
Okay. Come to the mic, please.
Questions by (b) (6) (b) (6) (b) (6) (b) (6), former member of the Charleston Board of Zoning and Appeals from 1999 to 2006. Point of now, you send it to Tim Scott.
I see that we -- we -- the concern is, since

Page 28

the developer is paying for the clean-up, right, what obligations does the developer have directly to the community? And if they meet your standards and they meet DHEC's standards, which DHEC has a policy right now for citizens, a -- a -- a proposed -- Senate Bill 150, that if a citizen, regular citizen, files a complaint against a developer or a -- a -- based upon the rules, then that person would then -- possibly could go to jail for perjury if they're not correct in -- in -- in -- in their -- their claim or accusation against anybody that requests a permit from DHEC. Okay? That's one thing.
I filed a complaint many years ago regarding air quality for a number of uses in the area. I grew up in the Neck area, so. I grew up there. Right? And in terms of getting [unintelligible] back, from 1970 to nineteen -- the EPA was like in 1974, from '74 to 2008, regarding the air quality and the cause of -- of certain types of illnesses in our community.
Whether or not those annual reports will be available, based upon what we're talking about here in terms of the -- the -- the -- the types of -- of -- of -- of uses that were in here, industrial uses, intense industrial uses, before 1974.
So the EPA is like in '74. So uses for 1930, '40, '50, '60, in the area. And so if you've got any

Page 29

studies that go back that far that could be provided to the community, I think that's really important so the people know what -- the cause of certain illnesses in their families: Cancer, you know, certain cancers in the community, asthma, whatever. These are real important.
And that's why we wanted to get the nineteen -- 2008 was, what was the studies you had from 1974 to nineteen -- 2008, regarding those types of -- of situations with the types of uses in our area over the years.
Also, another question is, with procedure in 1946, if an EPA employee is working with a paid developer, $30 million dollars, what real accountability do you have to the community? Can -- can -- can -- can -- what -- what -- what -- if he's going to pay for all the work that's being done?
And, mind you, we had, in the community, a group of stakeholders in -- in an apartment zone, via Jim Clyburn's office, many years ago, in 2001. Well, many people in the community were concerned about policy, those types of issues.
Now property that's theirs is not worth nothing. It's not worth anything. Once the Super -- the main Superfund money, then -- then values go up. So -- so there's no mitigation with EPA regarding price points.

Page 30

And back in 1990, houses were like $150,000 in our neighborhood. Now it's a quarter of a million dollars in our neighborhood. The EPA doesn't -- it doesn't look at the ultimate beneficiaries being the intended beneficiaries in the community.

So the intended beneficiaries in the community is all -- all going to benefit off of dirty property that's going to be cleaned up with their own money. How's it benefiting our community?

MR. ZELLER: Well, let me -- let me make an attempt to try to answer your question, sir. Thank you.

So we are going to be working with the developer -- "we" being EPA, "we" being the State of South Carolina -- to make sure that we fulfill our obligations with this project. This project, to us, will be no different than any other clean-up, regardless of who's doing it, so.

One of the reasons we're here tonight is to actively engage with the community to make sure that you know what's -- what's planning to happen, what's -- what's fixing to happen over the next couple years in zip code 29405.

And so we -- and we take that obligation very seriously. We're going to continue to, you know, reach out, make sure that you're actively engaged, you're

Page 31

informed on what's being done here. I can promise you when that work's done, it will be done in accordance with State and federal regulations as well as local regulations.

Dust control. We'll make sure we have dust suppressant, you know. We'll be wetting things down. Make sure that we're -- you know, have traffic patterns. Also, you know, we're basing all the truck traffic -- it will be safely delivered and we won't have any -- you know, do our very best to make sure we don't have traffic accidents and all that kind of stuff.

So it will be very carefully planned.

(b) (6): And for -- and for the record, I received administrative appe -- an administrative rejection from the EPA, May 4th, 2010, State Ports Authority, DHEC and, also, City of Charleston, and -- and -- and -- and regarding administrators. And -- and -- the main administrators then, are not around now.

MR. ZELLER: Uh-huh.

(b) (6): And -- and so these stakeholder groups that you're working with, I hope that they actually qualified as experts on many issues. Any time that the -- the DHEC and the EPA recognize stakeholders in the community but not looking into their expertise in making these recommendations, we hope that as you move

Page 32

forward -- if -- if -- it went bankrupt, Magnolia did. Bankrupt.

So you got bankrupt property, a bankrupt property, right in the million of millions, being sold for $8.6 million dollars the first [unintelligible]. They're going to spend $30 million dollars on improvements already been made already. So how's it going to come back to the community? Is it a hard question?

Would you rephrase how the development and get to them and say, okay, HUD. Okay. You certify Brownsfield's application, a long list of 2001. How we going to -- we going to re-mitigate this project?

Because you -- you're saying we're going to start from square one. Well, square one went broke. So how we going to re-mitigate through the -- from the $50 million dollars or 50 -- $10 million dollars in -- in infrastructure improvements that my City of Charleston has in sales tax, $15 million? That could afford Affordable Housing, that means. How are you going to address an issue with other -- other parties?

MR. ZELLER: Let me ask -- thank you for your question. And when I get some people up -- I'll answer that, and then we have to give -- let some other people up, answer the question. Then you can come back

Page 33

and ask a question.

How is this going to better your community? Well, I can think of a number of ways, off the top of my head.

We're going to delete a site from the NPL. We -- we -- when we put sites on the National Priorities List, make them a Superfund site, there is some presumption that, at some point in time in our lifetime, we will get those sites off the National Priorities List and return them to beneficial re-use.

That alone, by getting this site -- taking what is -- we'll use the lemon to make lemonade. By getting this site off the Superfund site -- Superfund list -- we have cleaned it up, taken it to its highest beneficial use, and have returned what was an eyesore -- blighted industrial property -- to a improved community. This will improve the community.

Another thing, the City of Charleston, also keeping an eye out on their constituents, passed this tax increment finance thing, this TIF. Right? While I'm not an expert in real estate, what that does is that by improving this property, you're going to bring in more tax revenue than it does now.

That property right now has -- basically, is hosted by tumbleweeds. The only person out there that's

Page 34

generating any tax revenue for the city is Mr. Parker and his pile manufacturing business. By putting a new land use on there, Starbuck's coffee shops, dry -- dry cleaners -- you know what kind of stuff I'm talking about with this mixed use, then still you're going to get a lot more business in 29405, which creates a lot of local sales tax that goes back into the community.

And all this -- this increased tax revenue that they generate because of this development, that increased revenue is mandated by the City of Charleston to go back into public infrastructure, including parks.

So just off the top of my head, those are a few things that I can see that what we're talking about today, this $30 million dollars in upgrades, are -- I -- I would offer that it's going to do quite a bit for this community.

(b) (6): Thank you for your time.

MR. ZELLER: Thank you. Appreciate your question.

Yes, sir?

Questions by (b) (6)

BY (b) (6): Hi. I'm (b) (6), (b) (6), (b) (6).

A big issue here in the Charleston area is planning for sea level rise, you know, the Risen Age [ph]

Page 35

project and all that, one and a half to two and a half feet, you know, over the next 50 years. I know [unintelligible] EPA, but how is that being handled in this plan?

Thanks.

MR. ZELLER: Thank you. A good question. Thank you for your question.

What -- actually, the net fill is 12 to 18 inches, bringing this property up, is related to some of that. This -- this whole footprint we want to bring up -- I wouldn't necessarily say that it's probably due to climate change, per se. That's more sea level rise and all that stuff that I'm, you know, not gonna -- in a position to debate today here, of course.

But part of that is because of the flooding and then, you know, kind of plan for, you know, the very stuff that you talked for, is to get this -- bring the entire property out of that flood plain and help with some of the drainage issues. The new -- the new drainage network is designed to, you know, minimize flooding and that kind of thing.

So there has been some consideration given to that. That's -- that's why the whole thing is going to come up about 18 inches.

Thank you.

Page 36

Anybody else?

MS. SPENCER: Any other comments?

(b) (6)?

Additional Questions by (b) (6)

(b) (6): Will there be any studies, again, available for the -- for the public you have regarding air quality issues that we need to get? Is -- is that going to come back to us?

In -- in particular, any information that you have under FOIA that we can request as a community, regarding the Magnolia project as it -- as it existing, and -- and what was done on that project, in -- in -- in -- in region -- in region -- in this region, in terms of DHEC and DHEC's responsibility as an agency, in -- in -- in terms of water quality, in -- in -- in -- in terms of air quality, in -- in -- in -- in terms of -- of -- of -- of mitigation in low-income communities?

I think that DHEC has some serious questions that need to be asked by you to them in terms of the extrication in our community and -- and the pertinence that has been provided in this area from the State Ports Authority.

All these pertinents have been very, very, very, very troubling to a lot of people in terms of property values. And that's what we're trying to get the

Page 37

[unintelligible] too look at. Whether or not these permits that's being issued are dealing with market forces -- and -- and a market force is a market force.

You -- you -- what you're talking about is we're gonna get a Starbuck's, we're gonna get this, we're gonna get that. Well, what's the disposable income you're going to need, to have that? The million -- [unintelligible] $24,000. What can people buy?

You're creating something, value added. But will the intended beneficiaries right now benefit from, ultimately, what you're -- what you're gonna be doing? That's my concern. And -- and -- and reshaping that conversation throughout the alternate beneficiary.

What will, ultimately, be the intended beneficiary? That's my concern.

Thank you for your service and time.

MR. ZELLER: Thank you.

And let's just add on that -- I don't know if there's a bunch of questions to answer there, per se.

But we will -- this is -- since is this being done, anything that we do, Magnolia -- this is not -- while it is being implemented by third-party developers, this is all being done under the oversight of the EPA and DHEC. So everything we do, reports will be approved, all additional clean-up stuff, this is all public record

stuff. All of this is FOIA-able. All this is gonna go on our web sites. We -- you know.

This is -- these -- once these documents are approved by EPA and DHEC, they're all publicly-available. This is a very transparent process here. This is all being done under our oversight. Everything that's associated with this project, design plans, moving forward, engagement plans for the community, those are all public record and we're happy to share any and all information we have with you.

MS. SPENCER: And, currently, all of those documents are in the library.

MR. BRYANT: Thank you for your time.

MR. ZELLER: Thank you.

MR. BRYANT: In the Reference department. It's five CDs.

Any other questions or comments?

Closing Remarks

MS. SPENCER: Okay. If there aren't any more questions or comments, please remember if you think of anything when you get home, pick up one of those Fact Sheets. There is a Comment page on the back. You can write your comment on there. Craig's address is already on the other side. You can mail it back to him. You can also e-mail him. His contact information as well as

mine is in there, as well.

And thank you for coming out tonight to hear this presentation, and we look forward to working with you guys.

MR. ZELLER: Thank you.

(The meeting concludes at 6:41 p.m.)

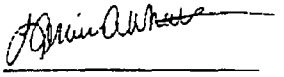
CERTIFICATE OF REPORTER

I, Lorraine A. Wharton, Court Reporter and Notary Public in and for the state of South Carolina, do hereby certify that the aforementioned public meeting was recorded by me and transcribed through computer-aided transcription by me to the best of my ability.

I FURTHER CERTIFY that the foregoing transcript is a true and correct transcript of the discussion held during said meeting at the time and place specified.

I FURTHER CERTIFY that I am neither attorney nor counsel for, nor related to nor employed by any of the parties to the action in which this meeting was held, neither am I financially interested in this action.

IN WITNESS WHEREOF, I have set my hand and seal this 10th day of October 2017.



Lorraine A. Wharton
Notary Public for South Carolina
My Commission Expires: 4/7/2027

CERTIFICATE OF REPORTER

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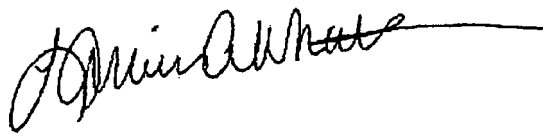

Lorraine A. Wharton
Notary Public for South Carolina
My Commission Expires: 4/7/2027

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APPENDIX C

SUPERFUND PROPOSED PLAN FOR RECORD OF DECISION AMENDMENT

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:

Craig Zeller, P.E.
Remedial Project Manager
US EPA R4 Superfund Division
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303
Zeller.Craig@epa.gov
404.562.8827 (office)

L'Tonya Spencer
Community Involvement Coordinator
US EPA R4 Superfund Division
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303
Spencer.LaTonya@epa.gov
404.562.8463 (office)

Joel Padgett, P.G.
Federal Remediation Section
Bureau of Land & Waste Management
SC Department of Health & Environmental Control
padgetjp@dhec.sc.gov
803.898.0832 (office)

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

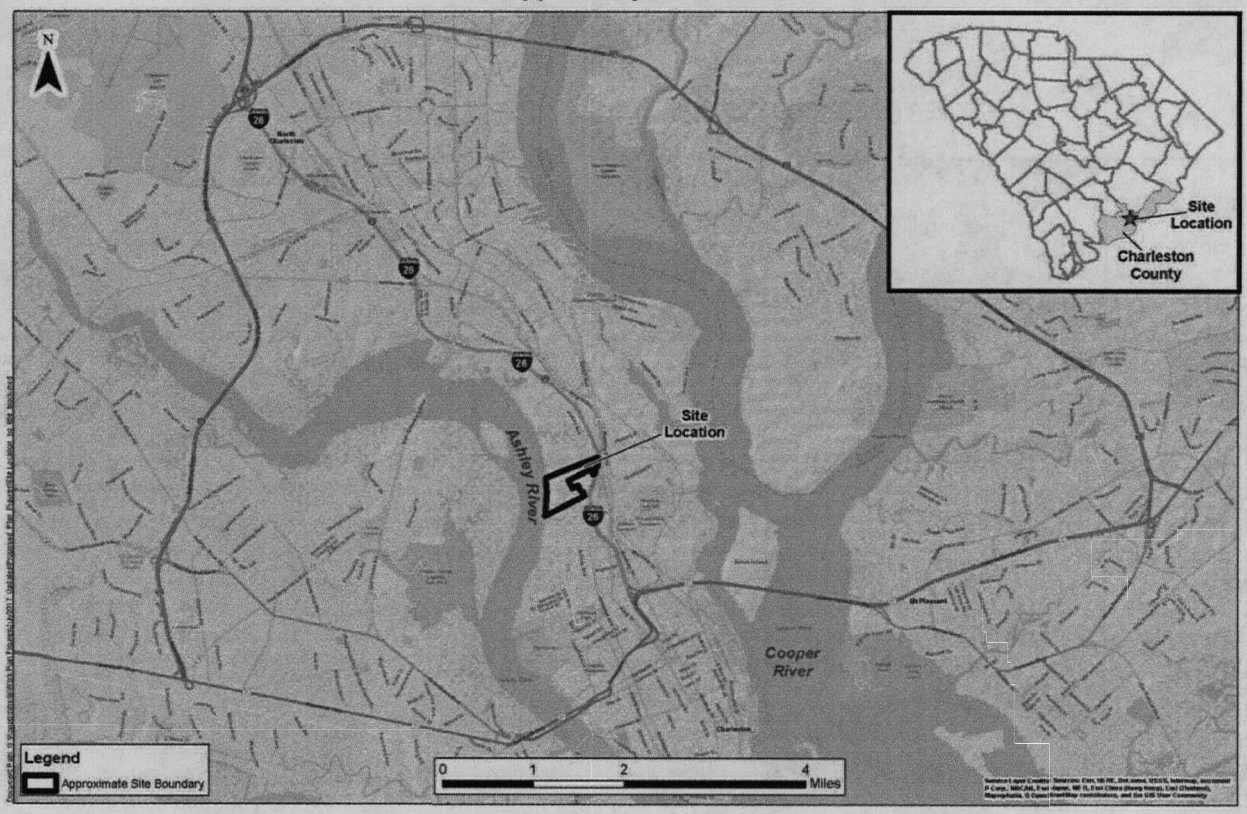

Figure 2
NPL Deletion Property

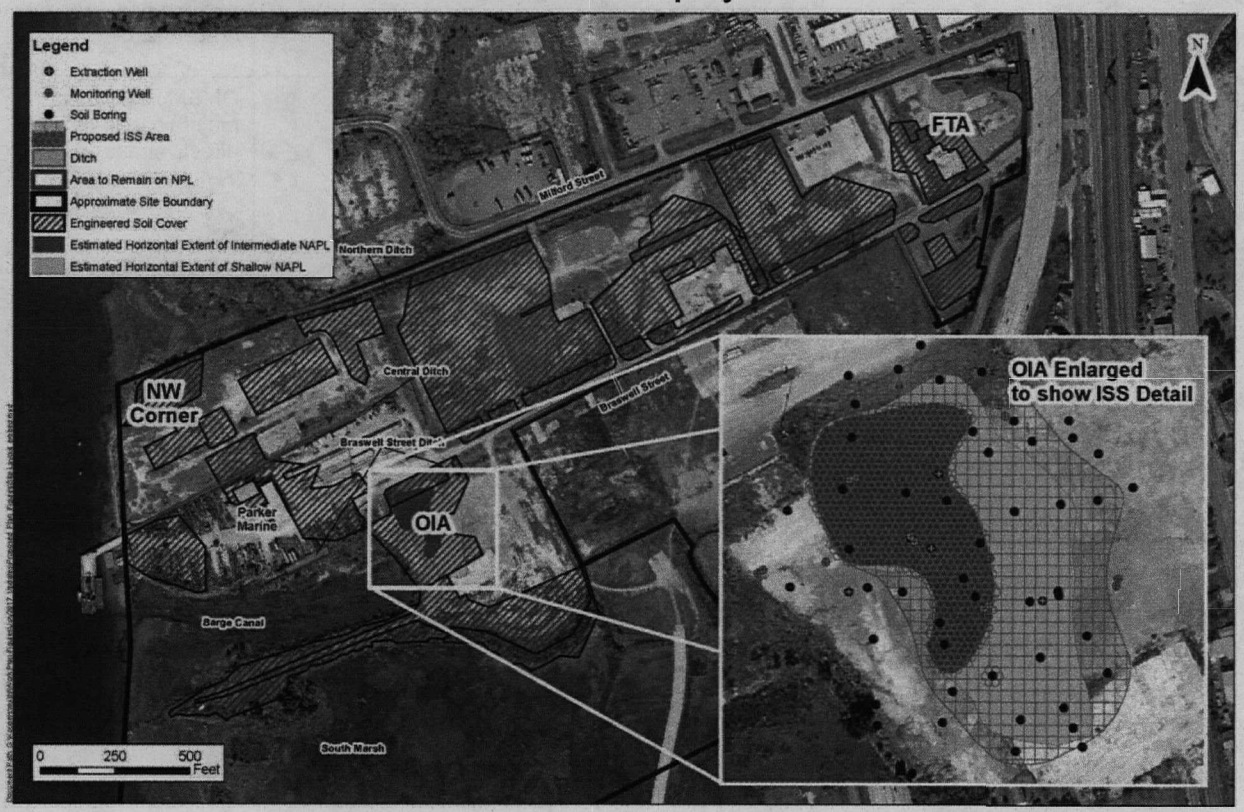

Figure 3
TI Waiver Zones