U.S. ENVIRONMENTAL PROTECTION AGENCY
SUPERFUND PROPOSED PLAN
ESCAMBIA WOOD TREATING COMPANY
SUPERFUND SITE
OPERABLE UNIT 2 – GROUND WATER

Pensacola, Escambia County, Florida **August 2014**

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is proposing changes to the remedy selected for ***Operable Unit* (OU)*** 2 (the groundwater portion) of the ***Superfund*** cleanup at the Escambia Wood Treating Company (ETC) Superfund Site in Pensacola, Florida. The EPA is the lead agency on this Site and is supported by the Florida Department of Environmental Protection (FDEP). Through this ***Proposed Plan,*** the EPA and FDEP present the proposed changes to the ***groundwater*** cleanup and request comments from the public. This Proposed Plan presents and highlights key information from the groundwater investigation and from the Focused ***Feasibility Study***, which are available along with other Site documents in the ***Information Repository*** (see inset).

The EPA documents the cleanup decision for a Superfund Site in a ***Record of Decision*** (ROD), and when the remedy (cleanup strategy) needs to be changed in a fundamental way, the EPA documents the changes in an ***Amended Record of Decision*** (AROD). The EPA selected the remedy for OU2 in 2008, choosing three technologies based on the level of contamination in different parts of the contaminated aquifer – a more aggressive approach in the more contaminated area and two less active approaches for the more dilute portion of the groundwater contamination.

Contact the EPA Community Involvement Coordinator for further information.

This Proposed Plan is part of EPA's requirements under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund). Greater detail can be found in the Focused Feasibility Study, and other documents in the Administrative Record.

The Information Repository and Administrative Record for the Escambia Treating Company Site are located at the:

Genealogy Branch Library
5740 N. Ninth Ave
Pensacola, FL 32504

EPA Region 4 Superfund Record Center
61 Forsyth Street SW
Atlanta, Georgia 30303

Direct comments or questions to:
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OR

L'Tonya Spencer, Community Involvement Coordinator

Superfund Remedial Branch, U.S. EPA
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, Georgia 30303
(800) 435-9234
Hours: Mon-Fri 8:00am-4:30pm

* Terms first appearing in italics are defined in a glossary at the end of this fact sheet.

COMMUNITY INVOLVEMENT OPPORTUNITIES

Public Comment Period

Dates: August 13 to September 15, 2014

Purpose: To comment on the Proposed Plan for Escambia Treating Company Site OU2.

Public Meeting
Date: Tuesday, August 19, 2014
Time: 6:00 PM
Place: New Hope Missionary Baptist Church, 3600 North Palafox
Pensacola, Florida

Since 2008, the EPA has identified more severe contamination, which will require additional cleanup. The EPA and the FDEP have been developing and evaluating remedial alternatives including treatment, extraction, and containment of the contamination. EPA's Preferred Alternative is to use thermal enhanced extraction as is detailed later in this document.

The EPA seeks public review and comments on this Proposed Plan, the alternatives presented and on EPA's Preferred Alternative. The EPA will accept public comments for at least 30 days, and the EPA will extend the public comment period if requested. Comments may be submitted by mail, email, phone, or in person at a public meeting scheduled for Tuesday, August 19, 2014 at 6:00 PM at New Hope Missionary Baptist Church. The EPA and the FDEP will consider the comments received and issue its final decision in an AROD.

EPA is issuing this plan in accordance with the requirements under Section 117 of the C***omprehensive Environmental Response, Compensation and Liability Act (CERCLA)*** and Section 300.435(c)(2)(ii) of the ***National Contingency Plan (NCP).***

SITE BACKGROUND

The ETC Site is located at 3910 North Palafox Street in the City of Pensacola, Escambia County, Florida, and is bordered on the north by residential neighborhoods, on the west by Palafox Street, on the east by a CSX Railroad switch yard, and on the south by an industrial park.

The ETC facility began operations in 1942 to manufacture wood products treated with creosote. Wood products, primarily utility poles and foundation pilings, were treated in pressure cylinders. Southern yellow pine was debarked, formed, dried, impregnated with preservatives, and stored until delivered to customers. From 1944 to approximately 1970, coal-tar creosote was the primary wood preservative. Creosote is a mixture of more than 200 organic compounds that is distilled from wood or coal tar at temperatures between 200^{o}C and 400^{o}C. Starting in 1963, pentachlorophenol (PCP) dissolved in No. 6 diesel fuel was also used at the facility and was reportedly the sole preservative in use from 1970 until 1982 when the facility closed.

The facility operations resulted in contamination of surface soil, subsurface soil, and groundwater. Contaminated wastewater and runoff from the former treatment area were the primary wastes managed at the facility. From the mid-1940s through the mid-1950s, all wastewater was sent to an unlined impoundment located in the northeastern portion of the Site, which became the primary source of groundwater contamination. This impoundment was later used for disposal of other waste.

Regulatory and Enforcement History

The ETC Site has a long regulatory history that begins with the submittal of a Notification of Hazardous Waste Activity Form sent to EPA on August 15, 1980. ETC ceased operation in October 1982. ETC conducted partial removal actions at the Site in 1985 and 1988. From 1985

to 1989, various violations were noted at the facility, and enforcement actions were taken by the EPA and the FDEP. In June of 1990, the EPA conducted a Site inspection and identified 31 ***Solid Waste Management Units*** (SWMUs) and two Areas of Concern (AOCs). ETC filed for bankruptcy and abandoned the Site in 1991.

Previous Cleanup Actions

The EPA initiated an extensive soil removal action at the ETC Site from 1991 to 1992 to stabilize the Site. Approximately 225,000 cubic yards (CY) of contaminated soil was excavated and was stockpiled at the Site under a secure liner system.

In 1994, the Site was added to the ***National Priorities List*** (NPL), and the EPA began a ***Remedial Investigation/Feasibility Study*** (RI/FS). Some nearby residents requested to be relocated permanently from their homes. In 1995, the EPA nominated the ETC Site to become part of a National Relocation Evaluation Pilot. In a 1997 Interim ROD, the EPA selected an interim cleanup action of voluntary permanent relocation for 358 households affected by the Site. The government acquired 158 single family homes, a 200-unit apartment complex, and 11 vacant residential lots, successfully relocating over 500 persons to comparable replacement housing. In 2006, an additional 46 households were identified as being impacted by the Site. Permanent relocation of these households began in December 2006 and was completed in 2009. A handful of property owners and residents opted not to participate in the relocation.

In 1998, the EPA designated the ETC area as a Brownfield Pilot, issued the final RI/FS Report for the Site, and divided the Site into two OUs. OU1 addresses the ETC Site soils in adjacent or nearby areas that were impacted by the Site. OU2 addresses groundwater impacted by Site contaminants and is the subject of this Proposed Plan.

OU 1 Soil Action and Relocation

In 2006, EPA issued the final ROD for OU1. The soil cleanup strategy was to treat principal threat wastes through ***solidification/stabilization*** (S/S) and to permanently isolate contaminated soil in an on-Site containment system. The construction began in October 2007 and was completed in June 2010, except for minor closeout items. The OU1 remedy resulted in the construction of a 550,000 CY containment cell and the permanent relocation of 46 households in the Clarinda Triangle neighborhood.

The OU1 Remedial Action removed all contaminated soil that was encountered above the water table. Leachability-based cleanup levels for soils are reflected in a March 2012 Explanation of Significant Differences (ESD).

During OU1 planning and construction, the EPA worked with the local government and community to maximize the reuse potential at the Site. The Site is suitable for commercial, industrial, or manufacturing redevelopment. The soil cleanup is designed so businesses can be located directly on top of the containment cell.

The OU1 soil remedy addressed the existing soil stockpile, soil contamination on-site, and soil contamination in areas adjacent to or near the Site, and included the National Relocation Evaluation Pilot Project. The remedy for OU1 is complete and is not affected by this action.

OU2 Groundwater Investigations and Activities

Numerous groundwater sampling investigations have been conducted at the ETC Site since 1982. Groundwater investigations were conducted at the Site by the EPA or by the State during the following periods:

- November 1982
- August and September 1987
- December 1987
- 1991

- January 1992
- July and August of 2000
- July 2001
- Early 2004
- Early 2005
- June 2005
- January 2007

An OU2 RI Report was completed in 2004. The EPA conducted additional investigations in 2005 and 2007 to explore cleanup options in more detail. The EPA presented these results and the cleanup alternatives for the groundwater in the 2008 OU2 Feasibility Study.

OU2 2008 Record of Decision

EPA issued a Proposed Plan for OU2 in June 2008 and after considering public comments, selected the OU2 remedy in the September 2008 ROD.

The 2008 OU2 remedy included three technologies based on the level of contamination in different areas of the aquifer. The most aggressive component of the remedy was *In situ* Chemical Oxidation (ISCO) for the areas with naphthalene concentrations of above 7,000 micrograms per liter (µg/L) and the areas containing small amounts of non-dissolved naphthalene or other creosote compounds. A second active component included *In situ* Enhanced Bioremediation (ISEB) through oxygen injection for the area containing naphthalene concentrations between 140 and 7,000 µg/L. ***Monitored Natural Attenuation*** (MNA) was also selected for the area containing naphthalene concentrations below 140 µg/L, which is the FDEP natural attenuation default criterion (NADC) for naphthalene. NADCs are used by the FDEP as a rule of thumb procedure to simplify the technical evaluation of natural attenuation. At this site, the NADC level for naphthalene is used to define the "Dilute Plume" in the conceptual site model, but the decision that MNA is an appropriate remedy is made based on EPA's MNA guidance. These components were to be applied in sequence from most aggressive to least aggressive.

Discovery of Additional Contamination

During the construction of the OU1 soil remedy and the design of the OU2 groundwater remedy, EPA conducted additional investigations around and inside the source area. In October 2008, one of these investigations discovered a significant amount of flowing liquid creosote ***Non-aqueous Phase Liquid*** (NAPL). This oily liquid represents an ongoing source of dissolved contamination. This NAPL was pumped from a well installed more than 100 feet (ft) below land surface (bls) in the location of a former wastewater pond and landfill that had been named "Solid Waste Management Unit 10 (SWMU 10)" during the 1990 EPA Site Investigation. While the presence of liquid creosote was anticipated by previous investigations, none had been found during because much of the SWMU 10 area was excavated during the 1991 removal action, which left an inaccessible pit about 40 feet deep.

EPA determined that the NAPL in the SWMU 10 area was serving as a continuing source of the groundwater contamination for the rest of the plume. Because the SWMU 10 source area was contaminated with large amounts of NAPL, the EPA determined that a new cleanup technology would be needed for the SWMU 10 area. Most of the remedy from the 2008 ROD remains appropriate for the extended dissolved groundwater plume. Once the AROD for the SWMU 10 source area is complete, technologies from both the 2008 ROD and the AROD will be used during the OU2 cleanup.

The EPA began a Focused RI and FS to understand the SWMU 10 source area and evaluate cleanup technologies. The additional investigations consisted of: 52 direct push soil borings and temporary wells; 45 Tar-specific

Green Optical Screening Tool (TarGOST®) soil borings; 10 sonic drilled borings; and 10 sonic drilled borings that also installed wells. Also, the EPA continued sampling the monitoring well network, which includes more than 60 monitoring wells. Major field investigations were conducted in:

- October 2008
- December 2008
- January and February 2009
- October 2010
- March and April 2013

This field work is summarized in a June 2010 Technical Memorandum titled *"Presentation and Discussion of Select DNAPL Remedial Technologies"* and in the July 2014 *"Focused Feasibility Study, Escambia Wood Treating Company Site OU2, SWMU 10"*. The results of all of the OU2 investigations to date were used to update the ***Conceptual Site Model*** (CSM), presented in the Site Characteristics section of this Proposed Plan.

Community Relations

The EPA has conducted community relations activities throughout EPA's involvement at the Site. Community relations activities have included factsheets, public meetings, site tours and the establishment of an ***Administrative Record*** (AR). The AR is a compilation of the materials and information EPA used in the decision making process. An Information Repository containing a copy of the AR and other information has been established at the Genealogy Branch Library, located at 5740 N. Ninth Ave., Pensacola, FL.

SITE CHARACTERISTICS

The ETC Site is located in an industrial part of Pensacola about 3.4 miles from the Gulf of Mexico. The groundwater in this area was used for municipal supply until several sources of groundwater contamination were discovered, including the ETC Site, the Agrico Superfund Site, and other former fertilizer plants, gas stations, and dry cleaners. Currently, municipal supply wells are located outside the areas contaminated by this site and other former industrial facilities. Current groundwater use in the ETC plume area is restricted to irrigation.

The ETC Site is located in the Coastal Lowlands subdivision of the physiographic division known as the Coastal Plain Province. The site-specific geology underlying the Site is considered typical for the area and is consistent with the regional zones within the Sand and Gravel aquifer. The aquifer includes the Surficial Zone (SZ), the Lower Permeability Zone (LPZ), the Main-Producing Zone (MPZ), the "Pensacola Clay Transition Zone", and the Pensacola Clay. The horizontal groundwater flow direction in all three water-bearing zones is to the east-southeast toward Bayou Texar. Figure 1 presents a cross section of the Site and the local aquifer.

The SZ consists of the saturated portion of fine to medium grained, well-sorted sands ranging in thickness from about 60 ft east of the ETC Site to about 20 ft near Bayou Texar. Groundwater in the SZ is unconfined and present on the ETC Site at depths ranging from 34 to 51 ft above mean sea level (amsl), or approximately 40 ft bls, depending on seasonal rainfall amounts.

The LPZ underlies the SZ and contains a layer of poorly sorted sands with a higher percentage of silty sand, clayey sand, silt, sandy clay, and clay in discrete and (assumed) discontinuous layers. The higher amount of clay and silt in the LPZ give it a lower permeability and a higher adsorptive capacity for binding contamination than the SZ of the aquifer. This layer ranges in thickness from about 58 ft at the Site to about 30 ft thick on the east side of Bayou Texar.

The MPZ consists of coarser sands and gravels. The top of this zone ranges in elevation from about -49 ft amsl at the ETC Site to -7 ft amsl near Bayou Texar. The bottom of this zone

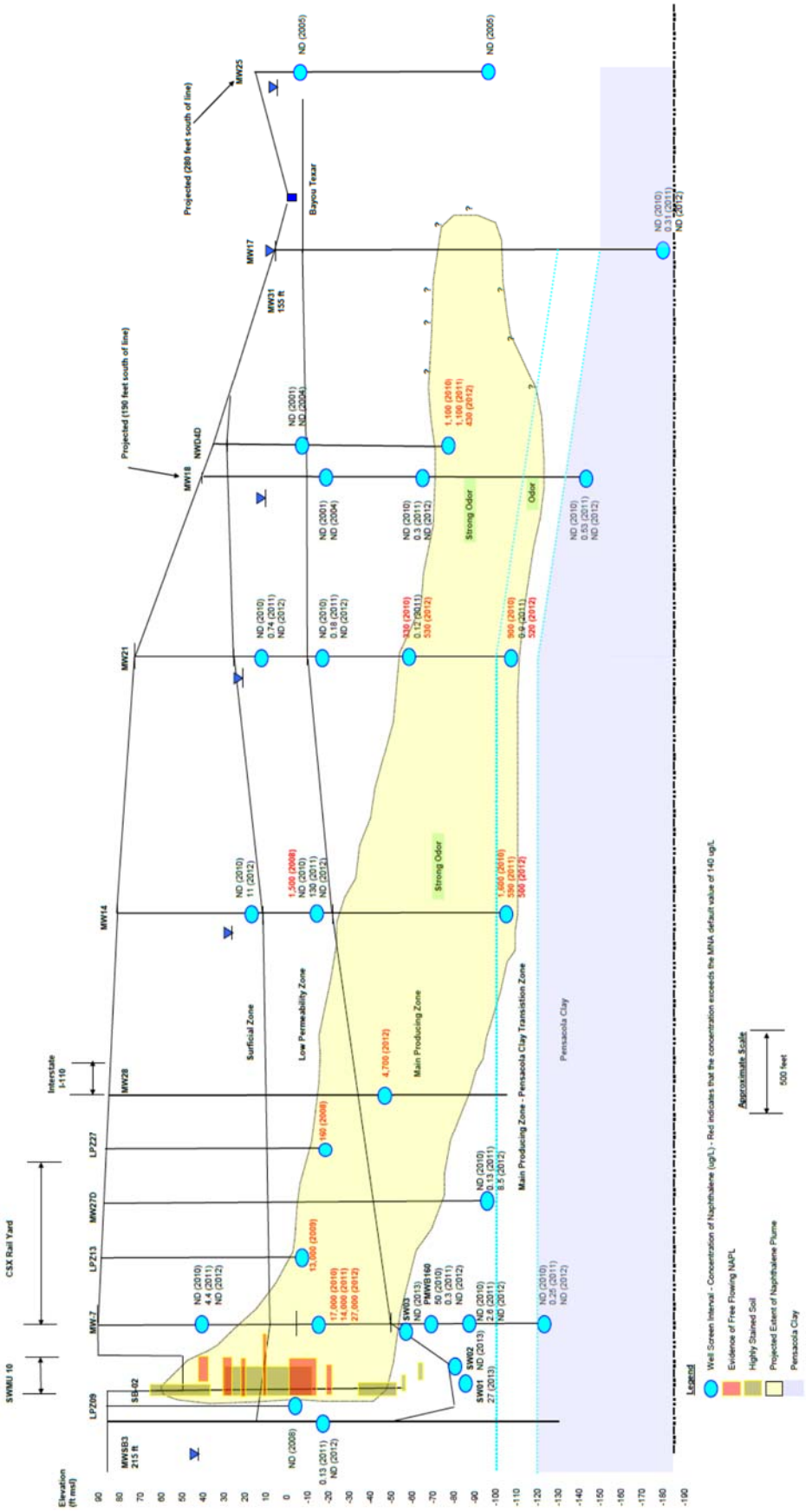


Figure 1. Cross section of the dissolved naphthalene plume from the ETC Site to Bayou Texar.

occurs about -120 ft amsl at the ETC Site to about -150 ft amsl near Bayou Texar. Regionally, this aquifer is used as a potable water supply, but in the downtown area, potable wells have been abandoned due to groundwater contamination from the ETC Site, other Superfund and State cleanup sites, gas stations, and dry cleaners.

The bottom 10 ft of the MPZ is referred to as the "Transition Zone". The Pensacola Clay underlies the MPZ and consists of clay and sandy clay, gray to dark gray in color with a low to very low hydraulic conductivity. The Pensacola Clay is an extensive, regional feature which occurs at about 190 ft bls or at -120 ft amsl, at the ETC Site. The Pensacola Clay is an impediment to downward contaminant movement.

Nature and Extent of Contamination / Conceptual Site Model

The creosote and PCP/diesel fuel wastes that leached into the Site soil and groundwater during the facility's operations are the origin of the Site-related groundwater contamination. The ***contaminants-of-concern*** (COCs) detected in both on-site and off-site monitoring wells reflect the typical constituents of coal-tar based creosote: the most widespread COCs are Naphthalene, Acenaphthene, 1 – Methylnaphthalene, 2 – Methylnaphthalene, Carbazole, and Dibenzofuran, which are present above federal and state standards through much of the groundwater plume. The focus of this Proposed Plan is the SWMU 10 area, which contains free phase NAPL and highly contaminated soils that are an ongoing source of groundwater contamination. The off-site dissolved contamination was the primary focus of the 2008 OU2 ROD. The extent of dissolved contamination and the basic layout of the 2008 OU ROD remedy are shown in Figure 2. Groundwater contamination decreases gradually from the SWMU 10 source area and has been divided into four areas for cleanup. Two areas contain NAPL contamination: the Source Area (SA) and the Highly Adsorbed Phase Area (HAPA). Two plumes contain low-level adsorbed phase and dissolved contamination: the High Concentration Plume (HCP) and the Dilute Plume (DP) shown in Figure 3 and described below.

Source Area (SA)

This area was added to the CSM after 2008. The SA contains thick areas of heavy NAPL contamination. This consists of both mobile free-flowing NAPL and non-mobile residual NAPL on soils that are heavily stained. In this area, NAPL is found in lateral lenses ranging in thickness from 4 ft to over 50 ft. The FFS describes the results of studies that quantify the extent of NAPL contamination. NAPL Mobility Testing on three severely contaminated samples from the SA showed an average NAPL saturation of 37.3% by volume, which equates to a NAPL concentration of 110,884 mg of NAPL per kg of soil (approximately 10% by weight). The FFS estimates that the SA comprises about 200,000 cubic yards of the aquifer and contains an estimated 200,000 gallons of NAPL. EPA considers the NAPL in the SA a principal threat waste. Figure 3 illustrates the approximate delineation of the SA.

Highly Adsorbed Phase Area (HAPA)

The HAPA contains soils stained with non-mobile NAPL or dissolved contamination above 7,000 µg/L of naphthalene. The stained areas tend to be 2 ft or less in thickness. The residual NAPL in these soils are not flowing, but still represent a substantial source for groundwater contamination. The 2008 ROD selected ISCO to treat this area. Figure 3 illustrates the approximate location of the HAPA.

High Concentration Plume (HCP)

The HCP is defined as the area containing no residual NAPL and dissolved naphthalene contamination below 7,000 µg/L of naphthalene, but above the FDEP NADC criterion of 140 µg/L. The site-specific cleanup level for naphthalene is

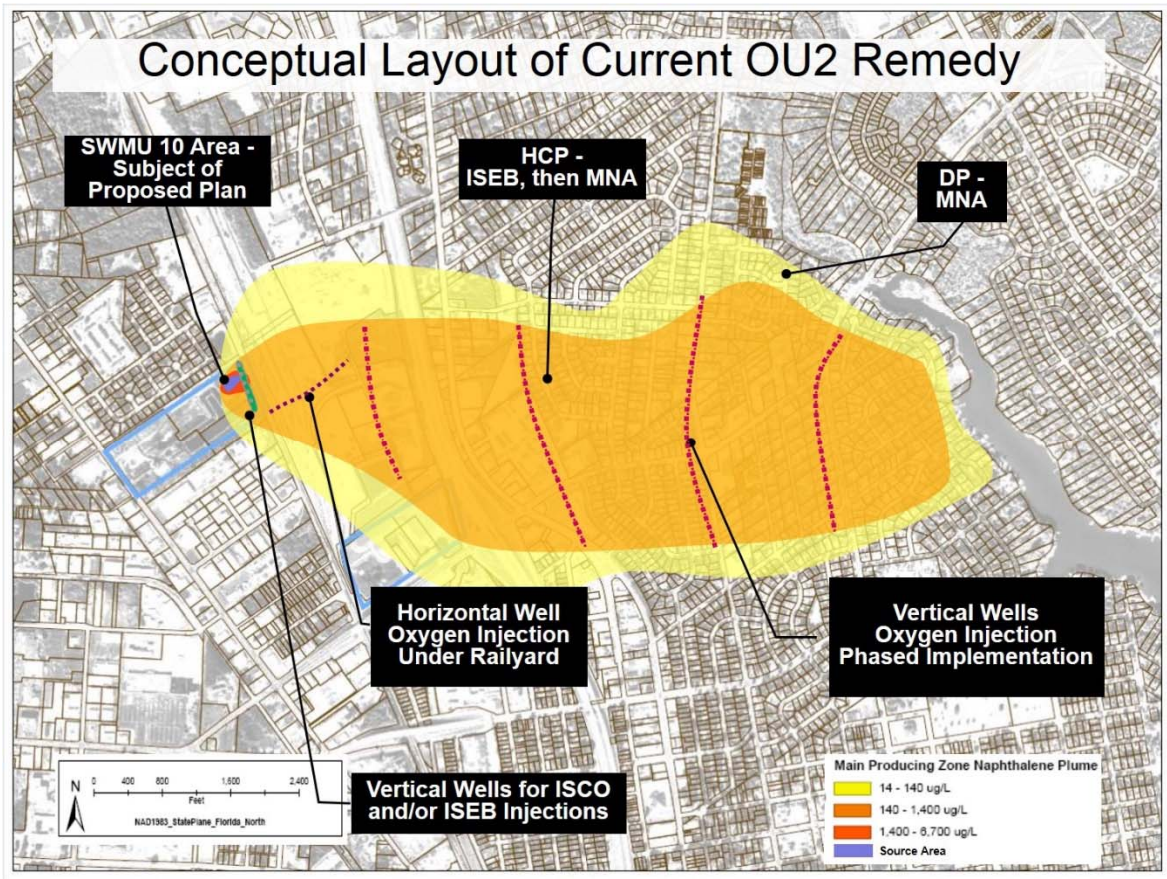


Figure 2. Approximate Extent of Dissolved Contamination and Layout of the OU2 Plume Remedy

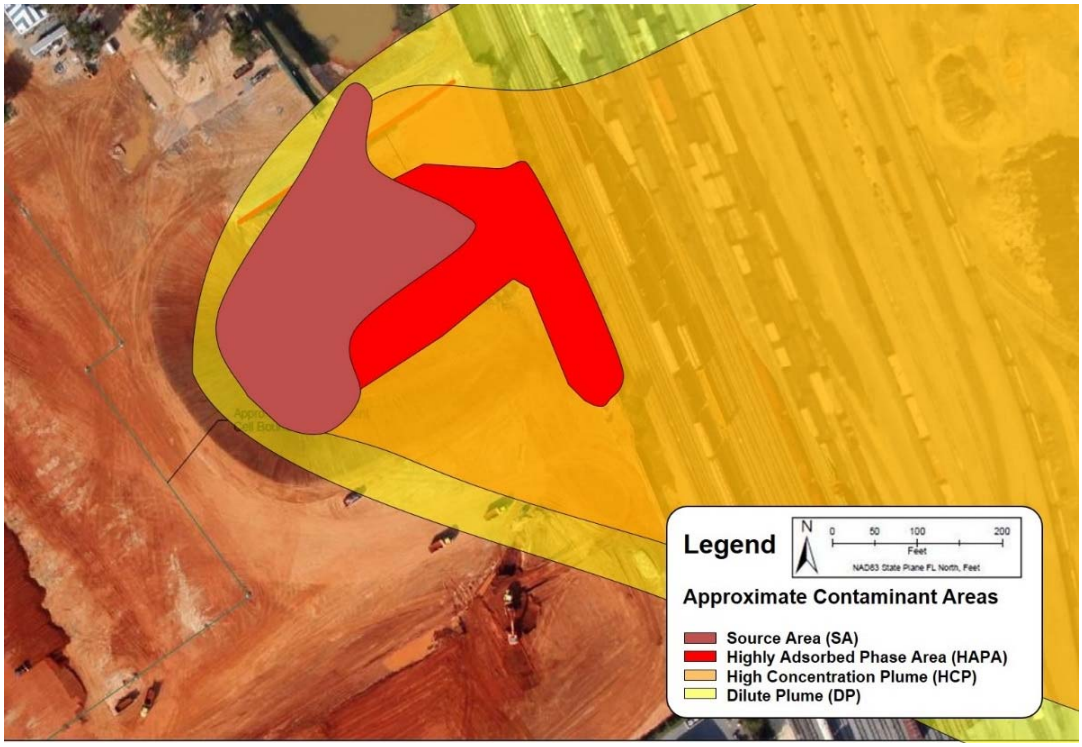


Figure 3. Approximate Locations of the Source Area, Highly Adsorbed Phase Area, High Concentration Plume, and Dilute Plume.

10 µg/L. This area requires some active treatment to reach acceptable concentrations. The 2008 ROD selected Enhanced Bioremediation to treat this area, and this remedy will not be changed by the AROD for the SWMU 10 source area.

Dilute Plume (DP)

The Dilute Plume area is defined by concentrations of dissolved naphthalene less than 140 µg/L, which is the FDEP NADC for naphthalene. The site-specific cleanup level for naphthalene is 10 ug/L. The 2008 ROD selected MNA to treat this area, and this remedy will not be changed by the AROD for the SWMU 10 source area.Figure 1 illustrates a cross section of the dissolved naphthalene plume from monitoring well MW04, located on the former facility, to MW14, located 2,500 ft downgradient. This illustrates the estimated vertical extent of naphthalene in the aquifer zones. The contamination appears to stay in the upper aquifer zones (SZ and LPZ) until it reaches east of the adjacent CSX rail yard, then between the rail yard and the interstate, the contamination moves into the MPZ. As the contamination moves in the MPZ towards Bayou Texar, the contamination decreases several orders of magnitude as natural attenuation and degradation occurs.

Some portions of the DP overlap with dissolved contamination emanating from the nearby fertilizer plants and warehouses, gas stations, and dry cleaners. The EPA installed wells on the opposite side of Bayou Texar but has found no evidence that the ETC plume crosses Bayou Texar.

The EPA has reviewed studies of Bayou Texar from the University of West Florida, and the EPA found no evidence of surface water impacts to the Bayou from the ETC plume. The current CSM shows that the contamination flows toward Bayou Texar and then flows south to the Gulf of Mexico. When the contaminated groundwater enters the tidally influenced zone of the aquifer, the rate of natural attenuation increases because of the flushing effect of the tide and the diurnal introduction of more oxygenated water.

Scope of Proposed Plan

This Proposed Plan applies to the OU2 groundwater remedy selected in 2008, which needs to be amended to address the newly discovered NAPL source area. This NAPL source is considered to be Principal Threat Waste and under CERCLA there is an expectation that Principal Threat Waste is treated to the maximum extent practicable.

Summary of Site Risks

In 2002, EPA conducted a ***Baseline Risk Assessment*** (BRA) to determine if the Site contamination could pose an unacceptable risk to human health or the environment if no cleanup actions were taken. The Human Health and Ecological Risks are summarized below. Based on the information presented below, implementation of the Preferred Alternative or one of the other alternatives identified in this Proposed Plan is necessary to protect human health and the environment from releases of hazardous substances, pollutants or contaminants from this Site, which may present an imminent or substantial endangerment to public health or welfare.

The EPA has determined that the 2008 ROD needs be amended to address the high levels of NAPL identified in the SWMU 10 area which acts as a continued source of groundwater contamination.

Human Health Risks

A Baseline ***Human Health Risk Assessment*** (HHRA) was conducted in 2002 as part of the BERA. The HHRA concluded that no excess health risk is associated with the current use scenario because drinking water is supplied to the affected area by a public water supply that is not impacted by the Site. The EPA is not aware

of any private or public drinking water supply wells in use within the ETC Site contaminant plume.

The HHRA determined that, in the future, water supply wells for residential use may be installed and that unacceptable risk could exist for future child residents and future child/adult residents. Most of the risk came from naphthalene, which had a hazard quotient of 84, followed by 2-methylnaphthalene, with a hazard quotient of 7. The extent of naphthalene contamination fully encompasses all site-related ground water contamination. In the future, potentially complete exposure routes are the ingestion of groundwater and inhalation of vapors released while showering. The groundwater COC that poses the most risk is naphthalene, which is the most soluble creosote compound and the most widespread contaminant in the plume. Other groundwater contaminants that pose unacceptable risk are included in Table 1. In addition, the levels of COCs in groundwater exceeded the federal and state MCLs. Therefore, action under CERCLA was warranted.

Ecological Risks

The major ecological feature of concern near the ETC Site is Bayou Texar. In 2002, a ***Screening-Level Ecological Risk Assessment*** (SLERA) was conducted for groundwater at the ETC Site. None of the chemicals retained in the risk assessment were detected in surface water or sediment samples collected from Bayou Texar. However, non-site related contaminants were found in Bayou Texar. Also, 68 storm water culverts were found to discharge into Bayou Texar. It was determined that any contribution of ETC-related contaminants to overall ecological risk in Bayou Texar is not measureable. Therefore, the SLERA process was not continued. While no current impacts to Bayou Texar were identified, EPA notes that addressing the human health risks associated with groundwater contamination will also fully mitigate the potential for future site-related impacts to Bayou Texar.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) provide an overall cleanup objective that guides the comparison and selection of remedial alternatives. The groundwater cleanup is integrated with the OU1 (soils) remedy, which removed contaminated soils that could act as a source for further groundwater contamination. The Remedial Action Objectives (RAOs) for groundwater at the ETC Site will not be changed from the previous OU2 ROD. EPA has identified the following as RAOs for contaminated groundwater at the Site:

- Prevent further contamination of ground water by aggressive treatment of the source area and principal threat wastes;
- Prevent future human exposure to contaminated ground water by treating the aquifer to meet health – based cleanup standards;
- Eliminate the potential for the future degradation of natural resources (Bayou Texar) from site- related contaminants; and
- Restore ground water to its beneficial use, which is drinking water.

The proposed action will add to the original remedy to restore the groundwater and eliminate potential future exposure.

The COCs for groundwater at the ETC Site will not be changed from the 2008 OU2 ROD. In the 2008 ROD, the COCs were presented in two tables: eight COCs were identified for the plume area, and eight COCs were identified for the source area. This was done because some contaminants are found only near the source area. Based on comments from the FDEP, all sixteen COCs are now listed in one table and will be applied for all ETC site-related groundwater contamination. If any site-related COCs are encountered that originate from other,

non-ETC sources, such as releases from gas stations or other waste sites, the EPA cannot use the CERCLA authority from the ETC Site to address those releases.

Table 1: Cleanup Levels for Groundwater (OU2)

Contaminant of Concern	Cleanup Level (µg/L)	Basis for Cleanup Level
1,1-Biphenyl	0.5	FDEP GCTL
1,2,4-Trimethylbenzene	10	FDEP GCTL
1,3,5-Trimethylbenzene	10	FDEP GCTL
1-Methylnaphthalene	28	FDEP GCTL
2 -Methylnaphthalene	10	HQ = 1
2,4-Dimethylphenol	140	FDEP GCTL
3- or 4-Methylphenol	3.5	FDEP GCTL
Acenaphthene	20	FDEP GCTL
Benzene	1	Federal MCL and FDEP GCTL/MCL
Benzo(a)pyrene	0.2	FDEP GCTL
Carbazole	1.8	FDEP GCTL
Dibenzofuran	28	FDEP GCTL
Naphthalene	10	HQ = 1
Nitrobenzene	3.5	FDEP GCTL
Pentachlorophenol	1	Federal MCL and FDEP GCTL/MCL
Phenol	10	FDEP GCTL

Notes:
µg/L micrograms per liter
FDEP Florida Department of Environmental Protection
GCTL Groundwater Cleanup Target Levels
HQ Hazard Quotient
MCL Maximum Contaminant Level
Remedial Levels include applicable criteria specified by Florida Administrative Code (F.A.C.) Chapters 62-777 and 62-550

The site-specific cleanup levels are listed in Table 1. The cleanup levels were calculated in the HHRA and the Focused FS and reflect the current federal regulatory drinking water standards or ***Maximum Contaminant Levels*** (MCLs) and current FDEP Groundwater ***Cleanup Target Levels*** (GCTLs). The cleanup levels also consider reaching a site-specific ***Hazard Quotient*** (HQ) of less than 1. If soil contamination in the vadose zone (above the water table) is found during the OU2 construction, the cleanup levels from the OU1 ROD and ESD will apply.

SUMMARY OF REMEDIAL ALTERNATIVES

The alternatives developed to address the additional contamination identified in the SWMU 10 source area are described below. Additional and more detailed information on the remedial alternatives can be found in the July 2014 *Focused Feasibility Study for OU2 SMWU 10* in the AR at the Genealogy Branch Library in Pensacola.

Cost estimates are approximations and are expected to be within -30% to +50% of the final costs. All construction timeframes are dependent on funding levels.

SWMU 10 Alternative S1: *SA & HAPA No Action*

Estimated Capital Costs: $ 0
Estimated O&M Costs: $210,000
Estimated Present Worth Cost: $210,000
Estimated Construction Timeframe: none
Estimated Time to Achieve Cleanup Levels and RAOs: none

The EPA evaluates the No Action alternative to use as a baseline for comparison if no remedial actions are taken. The SWMU 10 area would remain in its present condition and no further action would be implemented. Under this

alternative, no remedial action would occur. For comparison, costs are estimated for six Five-year Reviews (FYR) of the Site, each consisting of a site visit, groundwater sampling and analysis, and report preparation.

SWMU 10 Alternative S2: *SA & HAPA: Containment with Barrier Wall and Cap*

Estimated Capital Costs: $11,000,000
Estimated O&M Costs: $1,000,000
Estimated Present Worth Cost: $12,000,000
Estimated Construction Timeframe: 6 to 9 months
Estimated Time to Achieve Cleanup Levels and RAOs: 10-11 years in SA and HAPA, 30 years in HCP and DP per 2008 ROD

Alternative S2 is a containment approach using a wall and cap to isolate the contamination from the aquifer and from potential human or environmental exposure. A large amount of the SWMU 10 area, including the SA, the HAPA, and part of the DP would be contained by a vertical barrier wall of very low permeability material. The top of the containment area would be capped to prevent water infiltration. Barrier walls are typically built into or "keyed" into a low permeability horizontal layer of the aquifer to prevent groundwater from entering under the wall. The barrier wall would be extended to a depth of around 180 ft and would be keyed into the upper portions of the low permeability Pensacola Clay. This alternative would not provide active treatment inside the containment system or attain cleanup levels inside the containment. The depth of the containment (180 feet) may lead to potential technical difficulties as this depth is at the limits of the technology.

Alternative S2 Remedy Components

Activities associated with this alternative include (but are not limited to) the following:

1. Excavation and removal of an existing sheet pile wall
2. Backfilling the existing SWMU 10 excavation with soil. An estimated 120,000 CY of soil would be needed
3. Installation of approximately 1,667 linear ft of barrier wall completely around the SA, HAPA, and the on-site high concentration plume area. The barrier wall would be extended to a depth of around 180 ft and would be keyed into the upper portions of the low permeability Pensacola Clay (expected elevation of -100 ft msl).
4. Installation of a low permeability cap over the containment area. The cap would be graded to promote drainage off of the containment area.
5. Installation of groundwater monitoring wells to monitor the effectiveness of the barrier wall and cap system.
6. Continuation of ***Institutional Controls*** (ICs) to limit the types of construction permitted over the capped area and prevent groundwater usage within the SWMU 10 area.

SWMU 10 Alternative S3: *SA: Containment using Deep Soil Mixing*

HAPA: Surfactant Enhanced Aquifer Remediation (SEAR), In situ *Chemical Oxidation (ISCO), and* In situ *Enhanced Bioremediation (ISEB)*

Estimated Capital Costs: $23,000,000
Estimated O&M Costs: $2,000,000Estimated Present Worth Cost: $25,000,000
Estimated Construction Timeframe: 6 to 12 months
Estimated Time to Achieve Cleanup Levels and RAOs: 10-11 years in SA and HAPA, 30 years in HCP and DP per 2008 ROD

Alternative S3 combines a containment approach in the SA with groundwater extraction and *in situ* treatment in the HAPA. In the SA, Deep Soil Mixing (DSM) would be used to mix Portland cement into the aquifer using large specialized

augers to solidify the aquifer into a low permeability matrix.

In the HAPA, Surfactant Enhanced Aquifer Remediation (SEAR) would use surfactants, polymers, and co-solvents to increase the mobility of contaminants. A system of extraction wells would be installed and used to pump groundwater out of the aquifer. After SEAR extraction was complete, the approach in the HAPA would change to a treatment train of *in situ* treatment technologies, using ISCO then ISEB. ISCO works by injecting oxidizing compounds, such as potassium permanganate, that chemically react with the contaminants, breaking the contaminants into harmless minerals and byproducts. ISCO can be enhanced by using surfactants or co-solvents to either enhance the free phase removal of NAPL mass, thereby lowering the amount of oxidant required, and/or promoting NAPL dissolution to make it more available for subsequent oxidation. ISEB works by adding oxygen to groundwater to increase the activity of naturally occurring aerobic microorganisms that are degrading contaminants.

At the ETC Site, an ISEB treatability study has been performed which showed 50% to 90% reductions in naphthalene concentrations. ISEB and ISCO are components of the Selected Remedy for the dissolved groundwater plume in the 2008 OU2 ROD. Alternative S3 provides containment of contaminants in the SA and active treatment and destruction of contaminants in the HAPA.

Alternative S3 Remedy Components

Activities associated with this source alternative include (but are not limited to) the following:

1. Excavation and removal of an existing sheet pile wall.
2. Stabilization of subsurface soils within the SA to a depth of 110 ft.
3. Treatment of any residual contamination below 110 ft with ISEB, SEAR, and/or ISCO.
4. Installation of injection/extraction wells within the HAPA.
5. Performing SEAR/ISCO treatment in the HAPA. Monitor results and re-apply treatment as necessary.
6. Performing ISEB treatment in the HAPA over a period of 10 years.
7. Installation of performance monitoring wells to monitor the effectiveness of the treatment and the performance of the solidified SA.
8. Long term monitoring well network.
9. Continuation of ICs to limit the types of construction permitted over the monolith area and prevent groundwater usage within the SWMU 10 area.

SWMU 10 Alternative S4: *SA: Steam Enhanced Extraction (SEE) and* In situ *Enhanced Bioremediation (ISEB) with SEAR/ISCO, if necessary.*

HAPA: Surfactant Enhanced Aquifer Remediation (SEAR), In situ *Chemical Oxidation (ISCO), and* In situ *Enhanced Bioremediation (ISEB)*

Estimated Capital Costs: $7,000,000
Estimated O&M Costs: $7,000,000
Estimated Present Worth Cost: $14,000,000.
Estimated Construction Timeframe: 12 to 24 months
Estimated Time to Achieve Cleanup Levels and RAOs: 11-12 years in SA and HAPA, 30 years in HCP and DP per 2008 ROD

Alternative S4 combines extraction and *in situ* treatment technologies. In the SA, a highly aggressive extraction technique (steam-enhanced extraction (SEE)) would be used to remove the majority of NAPL, with additional extraction and *in situ* techniques applied as necessary. The first step in this alternative would be SEE, in which steam is injected into the aquifer to heat the NAPL and to increase its mobility for extraction by recovery wells. The mobilized liquids and volatilized vapors are recovered via multiphase extraction wells and treated with standard oil water separation and vapor recovery technology. Any dissolved phase constituents

can be separated and typically treated with tray counter-current air stripping or carbon.

This technology would require the construction of a treatment system consisting of wells, pipes and pumps to collect vapor and liquids; aboveground treatment systems for vapors and liquids; a temporary waste storage facility; a system of wells, pipes, and pumps to inject steam and reagents into the aquifer; and a steam plant. The injection and extraction well systems would be designed to accommodate steam, surfactants, chemical oxidants, and oxygen/air injections.

Steam Injection is typically economical and suitable for small, highly contaminated NAPL areas. For this reason, an integrated approach utilizing surfactants, chemical oxidation, and/ or ISEB is a viable multicomponent remediation strategy. The increased temperatures in the aquifer will enhance supplemental treatment technologies such as enhanced and natural biodegradation, chemical oxidation, and surfactant and co-solvent extraction. The transition between remedy components will be determined in the design. After the SEE reaches treatment objectives (to be finalized in the design) additional extraction using SEAR could be used, followed by ISCO and ISEB as necessary.

In the HAPA, extraction using SEAR followed by ISCO and ISEB would be used as described in Alternative S3. Under Alternative S4, the vast majority of contaminants in the SWMU 10 area would either be extracted or destroyed *in situ*. Future restrictions on land re-use would be minimal after the Site cleanup goals have been met. However, groundwater use restrictions would need to be in place until groundwater cleanup levels and restoration is achieved.

Alternative S4 Remedy Components

Activities associated with this source alternative include (but are not limited to) the following:

1. Excavation and removal of an existing sheet pile wall.
2. Installation and operation of the SEE system within the SA, including injection/extraction wells, transfer pipes, a steam plant and treatment systems.
3. Treatment and re-injection of extracted groundwater into the subsurface. Recovered NAPL would be sent off-site for treatment/disposal.
4. Implementation of ISEB treatment within the SA. SEAR and ISCO could also be used to continue treatment in the SA, as necessary.
5. Installation of injection/extraction wells in the HAPA.
6. Performing SEAR, ISCO, and/or ISEB within the SA and HAPA. Monitor results and re-apply treatment, as necessary.
7. Installation of performance monitoring wells to monitor the effectiveness of the treatment.
8. Continuation of ICs to prevent the disturbances of the subsurface soils and groundwater usage until remedial goals are met within the SWMU 10 area.

EVALUATION OF ALTERNATIVES

In selecting a preferred cleanup alternative, EPA uses the following CERCLA criteria to evaluate the alternatives from the Focused Feasibility Study (FFS). The first two criteria are threshold criteria and must be met for an alternative to be considered further. The next five are balancing criteria for weighing the merits of those that meet the threshold criteria. The final two criteria are used to modify EPA's Proposed Plan based on State and community input.

1. **Overall Protection of Human Health and the Environment** – Eliminates, reduces, or controls health and environmental threats through institutional or engineering controls or treatment.
2. **Compliance with *Applicable or Relevant and Appropriate Requirements* (ARARs)** – Complies with Federal/State standards and

requirements that pertain to the Site or justifies a waiver.

3. **Implementability** – Technical feasibility and administrative ease of conducting a remedy, including factors such as availability of services.
4. **Short-Term Effectiveness** – Length of time to achieve protection and potential impact of implementation.
5. **Long-Term Effectiveness & Permanence** – Protection of people and environment after cleanup is complete.
6. **Reduce Toxicity, Mobility, or Volume by Treatment** –Use of treatment to reduce the harmful effects of principal contaminants and their ability to move in the environment.
7. **Cost** – Benefits weighed against cost.
8. **State Acceptance** – Consideration of state's opinion of the preferred alternative(s).
9. **Community Acceptance** – Consideration of public comments on the Proposed Plan.

Comparison of Remedial Alternatives:

1. Overall Protection of Human Health and the Environment

All of the alternatives, except for Alternate S1, provide protection of human health and the environment. SEE and SEAR (Alternative S4) involve the physical removal of more contaminants and therefore provide greater overall protection of human health and the environment. The containment options in Alternative S2 and S3 are non-destructive; the contaminants would remain in place but would be securely contained.

2. Compliance with ARARs

Alternative S1 does not achieve RAOs or comply with site-specific cleanup goals. Alternatives S2, S3, and S4 meet location-specific ARARs. Alternatives S2, S3, and S4 would meet chemical-specific ARARs, except inside of the containment component of S2. Alternatives S2, S3, and S4 have some common activity-based ARARs, such as monitoring well installation. Other activity-based ARARs, such as related to operating a concrete plant or installing a cap over waste, only apply to particular alternatives. The specific analysis of activity-based ARARs for each technology is located in the FFS. Alternatives S2, S3, and S4 are capable of meeting activity-based ARARs.

3. Long-Term Effectiveness and Permanence

This criterion has particular importance for the SA remediation due to the RAO of "Prevent further contamination of ground water by aggressive treatment of the source area and principal threat wastes."

Alternative S4 physically removes or destroys contaminants and provides the most long-term effectiveness and permanence. Containment-based remedial alternatives S3 and S2 provide a lesser amount of long-term effectiveness and permanence because contaminants remain present in the aquifer: within the solidified matrix in alternative S3 and within a barrier wall in alternative S2. Alternative S1 does not meet this criterion.

4. Reduction of Toxicity, Mobility, and Volume through Treatment

Alternative S4 physically removes or destroys contaminants in the SA and HAPA and provides the greatest reduction of mass, volume, and concentration of contaminants. Alternative S3 uses containment in the SA and treatment in the HAPA, achieving less reduction than S4. Alternative S2 uses containment of both the SA and the HAPA, achieving less reduction than S4 and S3. Alternatives S3 and S2 do reduce mobility of the contaminants. Alternative S1 does not meet this criterion.

5. Short-Term Effectiveness

The short-term effectiveness considers the amount of time until the remedy effectively protects human health and the environment and considers the adverse effects the remedy may

pose to the community, workers, and the environment. Alternative S4 would more quickly remove contamination and would more quickly attain cleanup levels throughout the plume, however, the recovery of the plume area as a whole will require decades. Alternatives that involve extraction present more potential for accidental exposure to contaminants. Alternatives S2 and S3 are more effective in the short-term because the containment approach means lower chance of exposure to contaminants. Alternative S4 involves the extraction, transportation, and destruction or disposal of a much greater volume of hazardous material and is less effective in the short-term. Alternative S1 does not provide any protectiveness.

6. Implementability

Implementing remedial alternatives involves design, planning, construction, installation, and operation of the remedial action. The overall reliability, operational flexibility, and efficiency must also be considered. The extent and depth of NAPL contamination within the SA makes the implementation difficult. The containment options, Alternatives S2 and S3, can be installed in a short time frame and with minor site disruption; however, the depth of the containment may lead to potential technical difficulties due to the limits of the technologies. Steam injection and the accompanying extraction and treatment systems are complicated, but alternative S4 is more implementable overall, because the technology is well understood, and the characteristics of the site are within the capabilities of the technology. Alternative S4 also can be installed in a short time frame and with minor site disruption. The No Action alternative, Alternative S1, is the simplest alternative to implement.

7. Cost

To compare cost between remedies with different time frames for construction, the "net present cost" is calculated using a discount rate of 5%. Cost estimates at this stage are order-of-magnitude approximations and are expected to be within -30% to +50% of the final costs. The estimated net present worth cost of Alternative S1 is $210,000, Alternative S2 is $12,000,000, Alternative S3 is $25,000,000, and Alternative S4 is $14,000,000.

8. State/Support Agency Acceptance

FDEP has been involved in the process and has expressed support for Alternative S4 as the Preferred Alternative.

9. Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the Proposed Plan comment period ends and will be described in the ***Responsiveness Summary*** of the ROD Amendment for OU2.

SUMMARY OF THE PREFERRED ALTERNATIVE

EPA's Preferred Alternative for the SWMU 10 area is Alternative S4, shown in Figure 4. Alternative S4 consists of treating the Source Area with Steam Enhanced Extraction (SEE) and In situ Enhanced Bioremediation (ISEB) with Surfactant Enhanced Aquifer Remediation (SEAR) or In situ Chemical Oxidation (ISCO), if necessary. Alternative S4 includes treating the Highly Adsorbed Phase Area with Surfactant Enhanced Aquifer Remediation (SEAR), In situ Chemical Oxidation (ISCO), and In situ Enhanced Bioremediation (ISEB). Alternative S4 is compatible with the remedy for the OU2 groundwater plume selected in the 2008 OU2 ROD. This action in conjunction with the OU2 remedial action will eliminate future potential risk from exposure to contaminated groundwater.

EPA will use the design process to incorporate Alternative S4 remedies for the SA and the

HAPA with the 2008 ROD remedies for the HCP and the DP areas. The construction and funding strategy will be a central focus of the design process. The construction strategy could be phased to address the most severe SWMU 10 contamination first, then to assess the improvements on the down gradient plume areas. Phasing the remedial action in smaller pieces could expedite implementation and could create the opportunity for cost savings. The Preferred Alternative's cost estimate is $14,000,000. The 2008 OU2 ROD cost estimate was about $16,000,000.

The Preferred Alternative will achieve the RAOs and will remove and treat NAPL that constitutes a principal threat waste. After evaluating the cleanup alternatives according to the nine criteria established by CERCLA, Alternative S4 was superior to the other alternatives in overall protectiveness, long-term effectiveness and permanence, and implementability. The FDEP has been involved in the remedy selection process and has indicated support of Alternative S4. The Preferred Alternative could change in response to public comment or new information.

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

COMMUNITY PARTICIPATION

EPA seeks public review and comments on this Proposed Plan and on EPA's Preferred Alternative. The Information Repository and Administrative Record for the Escambia Treating Company Site are at the Genealogy Branch Library, 5740 N. Ninth Avenue, Pensacola, FL 32504. Electronic versions of this document are available from spalvins.erik@epa.gov

EPA will accept public comments for at least 30 days. Comments may be submitted by mail, email, phone, or in person at a public meeting scheduled for Tuesday, August 19, 2014 at 6:00 PM at New Hope Missionary Baptist Church, 3600 North Palafox, Pensacola, Florida.

EPA and the FDEP will consider comments received and EPA will issue an AROD selecting the final cleanup decision.

Please direct comments or questions to: Erik Spalvins, Remedial Project Manager, or to L'Tonya Spencer, Community Involvement Coordinator, at (800) 435-9234.

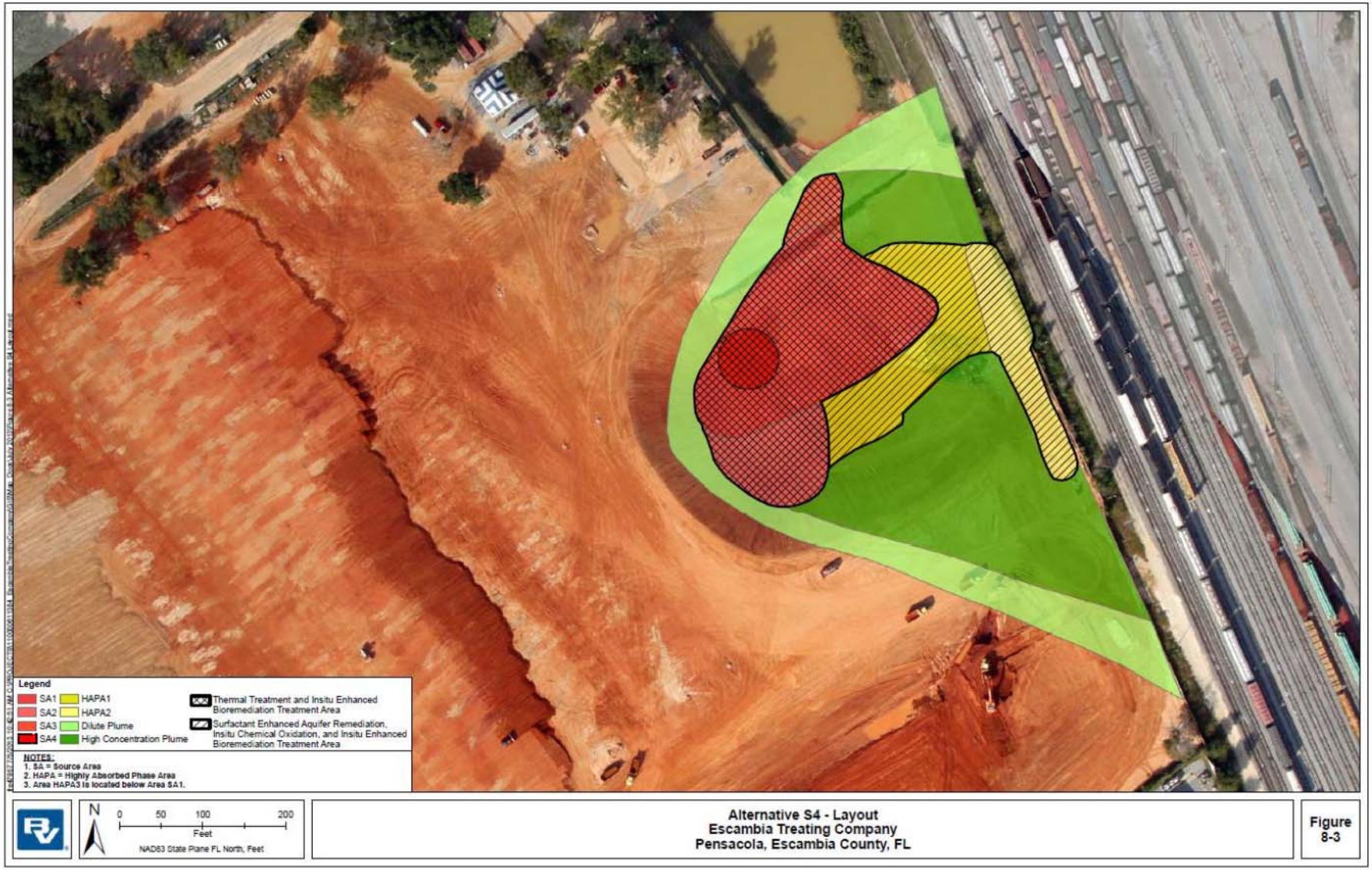
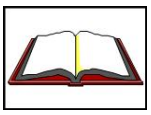


Figure 4. Layout of SWMU 10 Alternative S4



GLOSSARY

Administrative Record: Material documenting EPA's selection of cleanup remedies at Superfund Sites, a copy of which is placed in the **information repository** near the Site.

Amended Record of Decision (AROD): A formal document revising the Record of Decision.

Applicable or Relevant and Appropriate Requirements (ARARs): Any state or federal statute that pertains to protection of human life and the environment in addressing specific conditions or use of a particular cleanup technology at a Superfund site.

Baseline Risk Assessment: A qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and the environment by the presence or potential presence of specific contaminants.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): A federal law (also known as **Superfund**) passed in 1980 and modified in 1986 by the Superfund Amendment and Reauthorization Act (SARA); the act created a trust fund, to investigate and cleanup abandoned or uncontrolled hazardous waste sites. The law authorizes the federal government to respond directly to releases of hazardous substances that may endanger public health or the environment. EPA is responsible for managing the Superfund.

Conceptual Site Model: A planning tool that organizes information that already is known about a site and identifies the additional information necessary to support decisions that will achieve the goals of the project.

Contaminants-of-Concern (COCs): Chemical constituents associated with a Superfund Site that have been released into the environment and pose a risk to human health.

Feasibility Study: A study of the applicability or practicability of a proposed action or plan conducted after the Remedial Investigation to determine what alternatives or technologies could be applicable to clean up the site-specific COCs.

Groundwater: The supply of fresh water found beneath the Earth's surface (usually in aquifers) which is often used for drinking water.

Hazard Quotient: The ratio of an exposure level to a substance to a toxicity value selected for the risk assessment for that substance.

Human Health Risk Assessment: A qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and the environment by the presence or potential presence of specific contaminants.

Information Repository: A library or other location where documents and data related to a Superfund project are placed to allow public access to the material.

Institutional Controls: Restriction that prevents an owner inappropriately developing a property. The restriction is designed to reduce exposure to hazardous substances to workers or the general public and maintain the integrity of the remedy.

***In Situ*:** In its original place; unmoved unexcavated; remaining at the site or in the subsurface.

Maximum Contaminant Level (MCL): Contaminant-specific levels borrowed from Safe Drinking Water Act (SDWA) of 1974 that are the maximum levels of hazardous waste or hazardous constituents allowed to be present in the groundwater.

Monitored Natural Attenuation (MNA): This term refers to the reliance on natural attenuation processes to achieve site-specific remediation objectives. The natural attenuation processes that are at work in such remediation approach include a variety of physical, chemical, or biological processes that, under favorable

conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater.

National Contingency Plan (NCP): The Federal Regulation that guides the Superfund program. The NCP was revised in February 1990.

National Priorities List (NPL): List of sites under EPA's Superfund program, which investigates and cleans up hazardous sites nationwide.

Non-aqueous Phase Liquid (NAPL): A liquid consisting of organic compounds that do not dissolve in water or mix with water. The liquid could be lighter or heavier than water.

Operable Units (OUs): Separate activities undertaken as part of a Superfund site cleanup. Often a Superfund Site is divided in phases to better address different pathways and areas of contamination.

Proposed Plan: A Superfund public participation fact sheet that summarizes the preferred cleanup strategy for a Superfund Site.

Record of Decision (ROD): A legal, technical, and public document that explains which cleanup alternative will be used at a Superfund NPL site.

Remedial Action Objectives (RAO): Provide overall cleanup goals which guide the comparison and selection of remedial options.

Remedial Investigation / Feasibility Study (RI/FS): A two part investigation conducted to fully assess the nature and extent of a release, or threat of release, of hazardous substances, pollutants, or contaminants, and to identify alternatives for clean up. The Remedial Investigation gathers the necessary data to support the corresponding Feasibility Study.

Responsiveness Summary: A summary of oral and written comments received by EPA during a comment period on key EPA documents, and EPA's responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns for EPA decision-makers.

Screening-Level Ecological Risk Assessment (SLERA): An evaluation to assess the need, and if required, the level of effort necessary, to conduct a detailed or "baseline" ecological risk assessment for a particular site or facility.

Solid Waste Management Units- Discernible units where solid or hazardous wastes have been placed at any time, or any area where solid wastes have been routinely and systematically released.

Solidification/Stabilization: A general category of processes that are used to treat a wide variety of wastes, including solids and liquids.

Superfund: The common name for the program operated under the legislative authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), the federal law that mandates cleanup of abandoned hazardous waste sites.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Escambia Treating Company 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.

Place Stamp Here

Name_____
Address_____
City_____State_____Zip_____

Erik Spalvins, Remedial Project Manager
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ESCAMBIA TREATING COMPANY
SUPERFUND SITE
PUBLIC COMMENT SHEET

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