# U.S. ENVIRONMENTAL PROTECTION AGENCY

## PROPOSED PLAN

# *Southeastern Wood Preserving Superfund Site*

**Canton, Madison County, Mississippi** **May 2016**

### A. Introduction

The U.S. Environmental Protection Agency (EPA) Region 4 invites comment on a proposed **cleanup** plan for the Southeastern Wood Preserving (SEWP) **Superfund*** Site, located in Canton, Madison County, Mississippi (MS) (Figure 1). This **Proposed Plan** presents the options evaluated and the Preferred Alternative to address the soil/**sediment** contamination at the SEWP Site and EPA's rationale for its preference.

A summary of findings from major site activities is included, such as the **Remedial Investigation** (RI) Report, the **Baseline Risk Assessment** (BRA; Human Health and Ecological), and the **Feasibility Study** (FS). The EPA is issuing this Proposed Plan as part of its public participation responsibilities listed in the **National Oil and Hazardous Substances Pollution Contingency Plan** (NCP). The EPA consulted with the MS Department of Environmental Quality (MDEQ), the support agency, in developing this Proposed Plan.

***Purpose of the Proposed Plan:*** A Proposed Plan document is the document that summarizes the information that supports EPA's basis for the Preferred Alternative and solicits public involvement in the site's remedy selection process. This Proposed Plan presents: (1) EPA's recommendation on how best to address contamination and risks at the SEWP Site; (2) alternatives that were developed and evaluated; and (3) basis for EPA's recommended Preferred Alternative. The EPA, in consultation with MDEQ will select the final remedy for the SEWP Site after receiving and considering all information submitted during the **public comment period**.

## PUBLIC COMMENT PERIOD

**June 6 - July 11, 2016**

## Public Meeting

**Canton Community Center**
**337 North Union Street**
**Canton, MS 39046**
**June 16, 2016**
**6:00 pm to 8:00 pm**

As part of public involvement during the public comment period, the community is invited to a public meeting. EPA will present its understanding of the site, describe its reasoning for the Preferred Alternative presented in this Proposed Plan, and answer questions from the community. Oral and written comments also will be accepted at the public meeting.

**For Additional Information:**

**Southeastern Wood Preserving Site Information Repository**

Canton Public Library
102 Priestley Street
Canton, MS 39046
Phone: 601-589-3202
Hours: Mon, Wed 9am – 6pm;
Tues, Thurs 9am – 7pm;
Fri, Sat 9am-5 pm

**Shelby Johnston**
Remedial Project Manager
U.S. Environmental Protection Agency
Phone: 404-562-8782
E-mail: Johnston.Shelby@epa.gov

* Terms first appearing in bold are defined in a glossary at the end of this document.

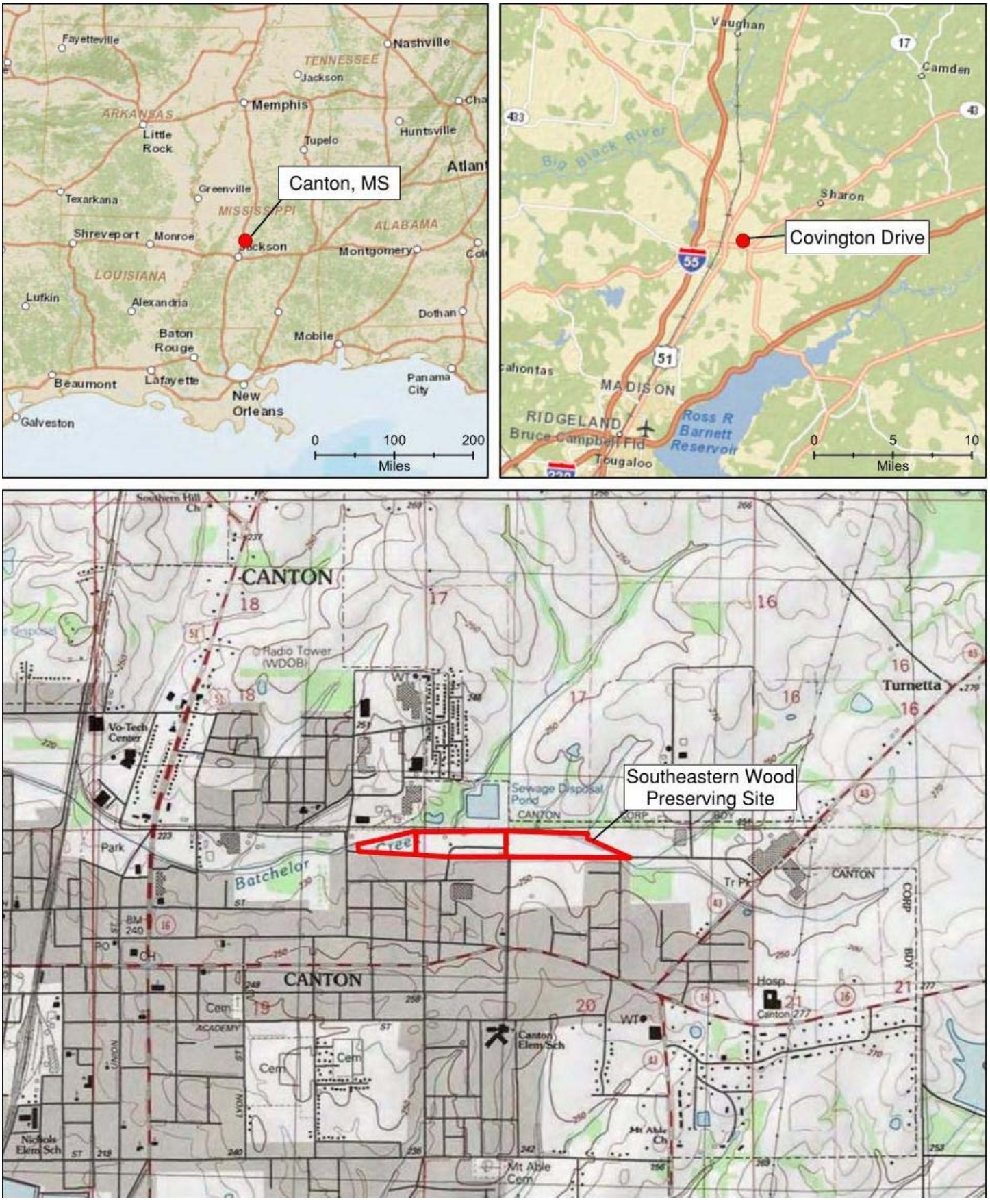


**Figure 1: Southeastern Wood Preserving (SEWP) Superfund Site Location Map**

The Preferred Alternative presented in the Proposed Plan may be modified, or EPA, in consultation with MDEQ, may select another alternative presented in this Proposed Plan, based on new information or public comments. Therefore, the public is encouraged to review and comment on all alternatives presented in this Proposed Plan. A complete set of documents related to SEWP Site activities is available in the Administrative Record at the SEWP Site **Information Repository** at the Canton Public Library in Canton, MS.

**B. Site Background**

The 25-acre SEWP Superfund Site is an inactive wood-treating facility that operated from 1928 until 1979 when the company filed for bankruptcy. The Site is located in a predominantly agricultural and residential/commercial area. Major contaminants present in the soil and stream sediments are semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol (PCP) and dioxins/furans, which were released as a result of the former wood treating processes. Specifically these include Naphthalene, Benzo(a)pyrene and Dioxin. Much of the contaminated soil in the Main Source Area at the site located near process areas and the Former Treatment Facility is considered to contain Resource Conservation and Recovery Act (RCRA) Listed hazardous waste (codes F032 and F034) which includes wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes that used creosote and chlorophenolic formulations. Creosote dense non-aqueous phase liquid (DNAPL) is present in the soil beneath the former facility operational area and in Batchelor Creek; most of the DNAPL mass is located beneath the former waste ponds (Figure 2).

***Operational History:*** The Site was originally part of a larger property owned by King Lumber, which operated the Site as a saw mill, lumber yard, and wood treating facility beginning in 1928. Canton Treating Company leased the wood treating operation portion in 1961 and purchased the property in 1964. In 1965, Dickson Treating Company began wood treating operations on the property until it filed for bankruptcy in 1979. In 1982, Southeastern Wood Preserving purchased the Site but did not operate the facility before the loan was in default. White Pole and Timber Company of Kennedy, Alabama (AL) purchased the physical assets. Madison County is the current owner of the property.

The actual treatment processes used at the SEWP are not well documented. It is likely that non-thermal processes such as; brushing, spraying, dipping, and soaking with coal tar creosote were used to treat the pine wood lumber.

Creosote is the most commonly used tar oil preservative chemical. It is often called “coal tar creosote” because of its close relationship to toluene, benzene, and tar. These materials are condensed from the distillation of coal as it is converted to carbon. Creosote penetrates deep into and remains in the wood for a long time.

At some point during its operation it appears that a pressure treatment process was employed at the Site using a pentachlorophenol (PCP) mixture for a very limited time. In a typical pressure treatment process, the timber is placed in a horizontal cylinder or retort and the cylinder is flooded with a chemical followed by a cycle of pressure and vacuum. Field observations of DNAPL and analytical data from the Site suggest that both creosote and PCP or a combination of both were used as treatment preservatives over the years of operation. Impurities within commercial grades of PCP can generate Dioxins and furans when heating.

Three on-facility, unlined wastewater treatment surface impoundments were constructed for disposal of wood preserving treatment sludges and process wastewater. These former impoundments are the main source area for the creosote DNAPL present at the Site.

*Regulatory History:* The State of Mississippi (MS) issued violations and fines for releases of hazardous substances to Batchelor Creek and inadequate treatment of process wastewater discharged to the city sewer in the 1970s. Prior to the Clean Water Act in 1977, it is reported that approximately 50,000 gallons of waste water were discharged directly to Batchelor Creek. In 1985, MS conducted a site inspection that included collection of soil, surface water and sediment samples. SVOCs were detected in the soil, sediments and surface water downstream of the facility. As a result the EPA initiated a time critical removal action to stabilize three unlined surface impoundments.

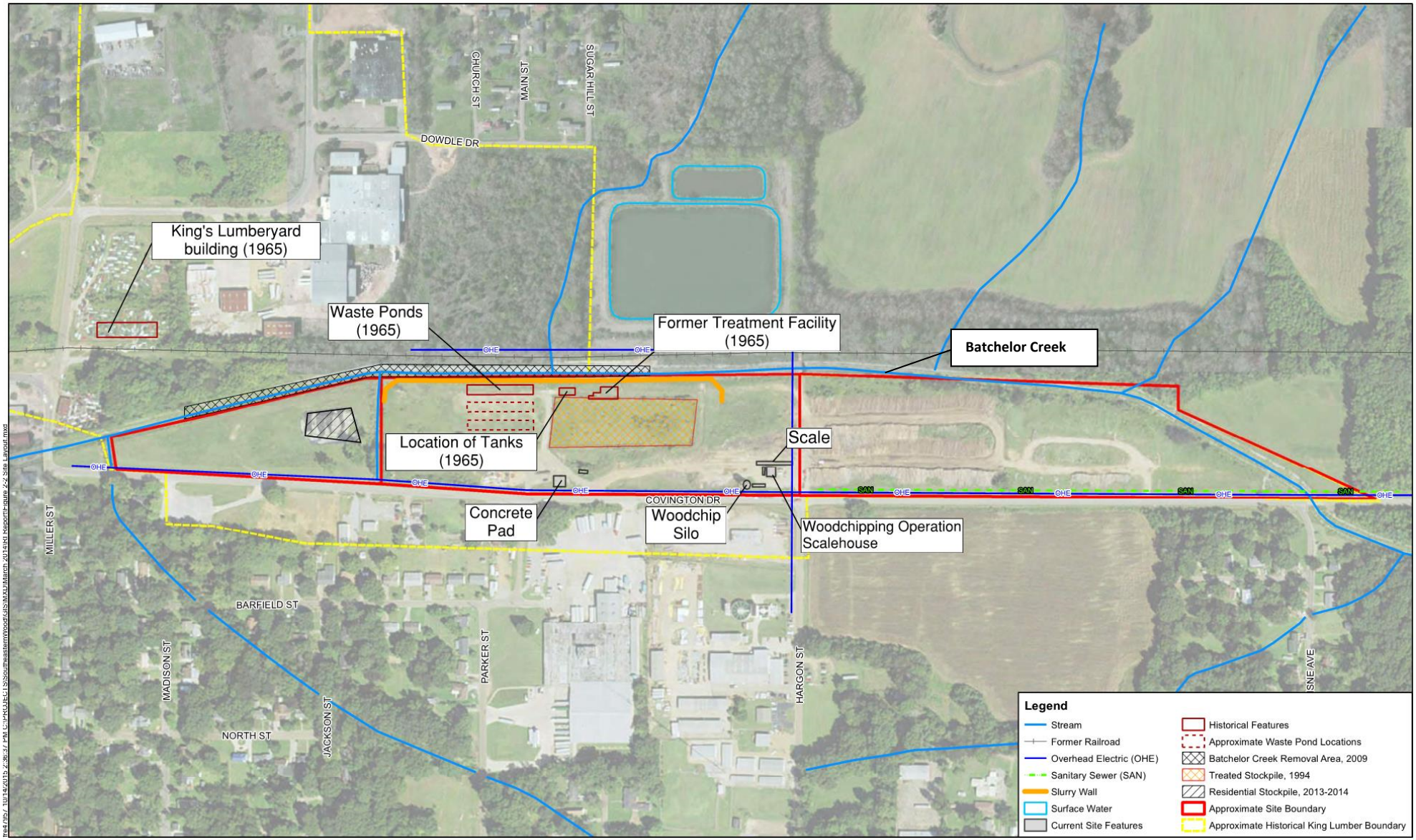


**Figure 2: Historic Site Layout for Southeastern Wood Preserving Superfund Site**

Approximately 10,500 cubic yards (cy) of sludge and soil were excavated, stabilized with lime kiln dust and stockpiled on the central portion of the SEWP facility to await treatment or disposal. The excavated material was classified by EPA as a Resource Conservation and Recovery Act (RCRA) K001 listed hazardous waste.

In 1989, EPA performed a creek widening / deepening of Batchelor Creek to assist an effort by Soil Conservation Services to better stabilize the creek banks. Contaminated soil was excavated to form a 20-foot (ft) wide bottom with 2:1 side slopes and a geotextile fabric liner and riprap were put into place. Soil generated by the creek widening was added to the on-site waste stockpile mentioned above.

From 1990-1994 during a removal action, the EPA conducted on-site treatment of the waste pond stockpile in order to meet RCRA land disposal restriction (LDRs) treatment standards for K001 so that it could be disposed of in accordance with RCRA regulations. EPA utilized a bioremediation batch process consisting of screening, mixing with water, slurring in bioreactors and final treatment in a double-lined treatment unit. Treatment of K001 contaminated soil was not entirely successful and a Treatability Variance for certain RCRA hazardous constituents was approved by the EPA Regional Administrator in 1992. The treated waste was placed on the central parcel in a lined containment cell, covered with an 18-inch composite clay and soil cover and fenced. This cell is referred to as the "Treated Stockpile (1994)" and is still present on the former facility awaiting incorporation into the final site remedy. Since the treatment process was not able to fully achieve the RCRA LDR treatment standards (including the alternative LDR treatment standards for soils at 40 CFR 268.49), additional treatment is required for roughly half the Treated Stockpile. Remedial alternatives were developed including off-site treatment and disposal in a RCRA permitted landfill and are described below.

In 2007 during a removal action, the EPA concluded that creosote DNAPL had the potential to flow into Batchelor Creek. In 2008, EPA conducted an Expanded Site Investigation (ESI) and discovered elevated concentrations of SVOCs in site soil and creek sediments. In 2009, EPA excavated approximately 1,100 linear ft of soil and sediment to a depth of 20-ft below land surface (bls) from Batchelor Creek. The creek was backfilled and lined with a geotextile liner and riprap. 2 to 3 ft of clay and clean topsoil were placed and graded over much of the Site. Approximately 45,800 cy of excavated soil/sediment was transported and disposed of at a local landfill. In 2010, EPA installed a 1,500 ft long subsurface barrier wall to 30-ft deep along the southern bank of Batchelor Creek to prevent further migration of DNAPL into the creek.

The site was listed on the **National Priorities List** (NPL) in 2012. The EPA began the RI in 2012. EPA also conducted a time-critical removal action of surface soil from 0-2 ft bls at 19 residential and commercial properties based on soil results obtained during the ESI and RI. An estimated 1,700 cy of soil were stockpiled on the western portion of the former facility to be incorporated in the final site remedial action. The removal action was completed in June 2014.

### C. Site Characteristics

***Topography:*** Land elevations at the SEWP facility range from approximately 245 ft above mean sea level (amsl) on the southeastern portion of the property and gradually descend to the northwest to 228 ft amsl, adjacent to Batchelor Creek. A slight topographic high is formed by the soil stockpile near the center of the facility with an elevation of 245 ft amsl. This topography allowed overland flow of creosote waste water from the holding ponds to flow into Batchelor Creek and into the on-site drainage ditches during seasonal heavy rainfall.

***Geology/Hydrogeology:*** The site-specific geology consists of surficial alluvial deposits that have been replaced by fill or topsoil during previous site remedial activities performed on the SEWP property. Underlying these surficial deposits is Yazoo Clay. The Yazoo Clay acts as a confining / semi-confining layer throughout central and southern MS. The Yazoo Clay can be divided into three zones. Zone A, or the surface zone, generally ranges from 0.5 to 1 ft thick and consists of highly weathered, brown, silty to sandy clay containing roots and organic material. Zone B, the weathered zone, generally ranges from 10 to 30 ft thick and consists of a light tan to yellowish brown stiff clay containing roots and organic materials. Zone B contains numerous desiccation cracks that are often 1 to 2 inches wide.

It is composed of “fat” clay minerals that can swell when saturated with water, but when the clay dries out, irregular fractures or cracks form from the shrinkage of the clay (desiccation). These desiccation cracks become conduits for secondary mineral growth or as potential pathways for contaminant migration (creosote DNAPL). Zone C, or the unweathered zone of the Yazoo Clay, consists of very stiff, blue-green to blue-gray, calcareous (limy), fossiliferous clay. This zone is not affected by the weathering process. Zone C, encountered from 18 ft bls to 37 ft bls, is more coherent and competent and has functioned as a confining unit preventing downward vertical contaminant migration of DNAPL to deeper depths.

The shallow fill, sandy clay, clay, and silty clay which characterize the Yazoo Clay Zones A and B are predominantly unsaturated soils with high moisture contents. The **groundwater** producing zone (**aquifer**) was encountered in the Cockfield Formation at depths between 310 to 320 ft bls.

Groundwater at the SEWP Site above 310 ft bls is characterized as an EPA Class III, Subclass IIIA, not suitable as a potential source of drinking water and of limited beneficial use per *Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy* (EPA, 1988). Subclass III groundwater is categorized primarily on the basis of having insufficient yield to supply a single household (e.g., less than 150 gallons per day [gpd]).

***Nature and Extent of Contamination:*** Creosote DNAPL is located in the vicinity of the former waste ponds at depths between 2 to 37 ft bls. The lateral extent of DNAPL is north of Batchelor Creek, along the old rail line to just downstream of the on-facility drainage ditch. DNAPL was observed in two borings located in Batchelor Creek. The DNAPL is contained within Zones A and B of the Yazoo Clay, to maximum depth of 37 ft bls. The DNAPL and the DNAPL-saturated soils are considered to be Principal Threat Waste (PTW), there is a preference to treat PTW wherever practicable per the NCP.

Dioxin and PAH soil contamination is present along the railroad right-of-way north of the former facility. On-facility surficial soil is contaminated with dioxins, PAHs and in isolated areas PCP between 0 to 2 ft bls. No surface soil on the western portion of the property exceeds the industrial soil preliminary remediation goals of 230 nanograms per kilogram (ng/kg) for dioxin toxicity equivalent (TEQ) or 2,400 micrograms per kilogram (µg/kg) for benzo(a)pyrene (BaP) TEQ. There are two soil stockpiles located on the western and central parcels. The Residential Stockpile is located on the western parcel and is considered non-hazardous soil and will be incorporated in the soil remedy. The Treated Stockpile on the Central parcel was previously classified as soil containing K001 hazardous waste and must be managed in accordance with the RCRA hazardous waste regulations. Subsurface soil contamination generally corresponds with the subsurface lateral and vertical extent of DNAPL; although isolated areas of SVOCs/PAHs in excess of the risk-based site-specific Removal Action Level of 2,400 µg/kg were recorded between 1 to 4 ft bls on the Central parcel and between 4.5 to 6 ft bls on the Eastern parcel. Isolated instances of deeper impacted soils are relatively low and were not targeted for remediation.

Groundwater contamination has not been detected due to the absence of a water table aquifer. The groundwater sampling results from the deeper aquifer in the region indicates no site-related impacts.

The sediments at the SEWP Site are those deposits found from 0.2 to 0.5 ft bls in Batchelor Creek, Bear Creek, and in associated tributaries and drainage ditches. Detectable concentrations of SVOCs are confined in sediments adjacent to and downstream of the former waste ponds.

### D. Scope and Role of Response Action

This Proposed Plan presents a final site-wide remedy to address the risks due to the contaminated media at the Site, including the Treated Stockpile. The contaminated media include: surficial and subsurface soil contaminated with SVOCs/PAHs, PCP and dioxins and DNAPL saturated subsurface soil located on or near the facility and beneath Batchelor Creek. The contaminated surface soil in the residential / commercial areas to the south of the former facility was addressed during the 2014 removal action performed by EPA. This removal action addressed all of the residential and commercial areas adjacent to the site and removed any soil which posed an unacceptable risk to human

health. No additional action is being proposed for this area.

The focus of the remedial alternatives presented in this Proposed Plan is to address the DNAPL source area and residual DNAPL in the subsurface. Additionally, there is surface soil including the Treated stockpile on the former facility containing dioxin and SVOC levels that pose unacceptable risks. The Preferred Alternative in this plan addresses these risks to human health and the environment.

## E. Summary of Site Risks

A Baseline Risk Assessment (BRA) is required as part of the RI and provides an evaluation of the potential threat to human health and the environment in the absence of any **remedial action**. The BRA provides the basis for determining whether or not remedial action is necessary and the justification for performing cleanup. The BRA consists of a **Human Health Risk Assessment** (HHRA) and an **Ecological Risk Assessment** (ERA).

The intent of the HHRA is to evaluate the potential risks to human health due to releases of chemicals and exposure to contaminants at the SEWP Site. The main objective of the HHRA is to determine unacceptable risks associated with the Site, whether action under CERCLA is warranted and contaminant levels that are protective. Cancer risks are considered unacceptable if the total cancer risk exceeds 1E-04, and non-cancer hazards are considered unacceptable if the total hazard index exceeds 1. The results of the HHRA for soil, surface water, sediment, and groundwater at the SEWP Site indicate that residential, industrial/ commercial worker, construction worker, and utility worker exposures result in unacceptable cancer risks, and residential and construction worker exposures result in unacceptable non-cancer hazards (See Tables 1 and 2). Therefore, action under CERCLA is warranted.

The chemicals of concern (COCs) identified in the HHRA in the soil and sediments at SEWP are listed in Table 3. The RI detected levels of naphthalene and PCP in the soil and/or sediment above regulatory screening levels; however, the HHRA determined that the concentrations of these chemicals were not a risk to receptors under the various exposure scenarios used in the evaluation. Additionally, no health risks were identified in the groundwater; therefore, groundwater was eliminated as a media of concern in the HHRA.

**Table 1: Summary of Reasonable Maximum Exposure Risks and Hazards – Current Land Use**

| Location | Receptor | Cancer Risk | | Hazard Index | |
|---|---|---|---|---|---|
| | | Min | Max | Min | Max |
| On-Site | Industrial Worker | 3E-06 | 2E-04 | 3E-02 | 0.5 |
| | Trespasser | 8E-07 | 7E-05 | 9E-03 | 0.1 |
| | Utility Worker | 5E-06 | 6E-04 | 9E-02 | 0.9 |
| Off-Site | Industrial Worker | 3E-06 | 5E-06 | 1E-05 | 0.1 |
| | Trespasser | 1E-06 | 1E-06 | 1E-05 | 0.03 |
| | Utility Worker | 1E-06 | 2E-05 | 9E-06 | 0.2 |
| | Resident | 1E-06 | 3E-04 | 9E-02 | 4 |

**Table 2: Summary of Reasonable Maximum Exposure Risks and Hazards - Future Land Use**

| Location | Receptor | Cancer Risk | | Hazard Index | |
|---|---|---|---|---|---|
| | | Min | Max | Min | Max |
| On-Site | Resident | 8E-05 | 2E-03 | 2 | 7 |
| | Trespasser | 8E-07 | 7E-05 | 9E-03 | 0.1 |
| | Industrial Worker | 1E-05 | 2E-04 | 2E-01 | 0.7 |
| | Construction Worker | 2E-06 | 2E-04 | 3E-01 | 2 |
| | Utility Worker | 5E-06 | 6E-04 | 9E-02 | 0.9 |
| Off-Site | Resident | 7E-06 | 3E-04 | 3E-05 | 6 |
| | Trespasser | 1E-06 | 1E-06 | 1E-05 | 0.03 |
| | Industrial Worker | 3E-06 | 1E-05 | 1E-05 | 0.3 |
| | Construction Worker | 4E-07 | 7E-06 | 4E-07 | 0.6 |
| | Utility Worker | 1E-06 | 2E-05 | 9E-06 | 0.2 |

**Table 3: Human Health Risks in Soil and Sediment and Identified Chemicals of Concern**

| Chemical of Concern | Soil | | | Sediment | |
|---|---|---|---|---|---|
| | Residential | Construction Worker | Utility Worker | Residential | Industrial Worker |
| 2,3,7,8-TCDD TEQ | x | x | x | | |
| BaP TEQ | x | x | x | x | x |

**Notes:** BaP - benzo(a)pyrene; TCDD - tetrachlorodibenzo-p-dioxin (dioxin); TEQ - toxic equivalent; Source: *Human Health Risk Assessment Report, Revision 1*, 2015

The purpose of the **Ecological Risk Assessment** (ERA) is to determine the potential effects to the environment from the Site contamination. The screening level ERA was developed as part of the RI. The EPA evaluated potential risks to aquatic organisms in Batchelor Creek and to sensitive terrestrial organisms (mammals and birds), in and around the SEWP Site. The screening level evaluation indicated negligible overall adverse risks were present. The information presented in the ERA was sufficient to determine that no further data was required to assess ecological risks. It is the EPA's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures presented in this Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances.

## F. Remedial Action Objectives

**Remedial Action Objectives** (RAOs) describe what a proposed site cleanup is expected to accomplish. The SEWP Site has the following RAOs:

1. Prevent human (adult / child resident) exposure to site-related contaminated soil/sediments at concentrations above levels that are protective.
2. Isolate residual/mobile DNAPL and adsorbed-phase SVOCs/PAHs/dioxins and prevent migration into Batchelor Creek;

Preliminary Remediation Goals (PRGs) are the concentrations for individual COCs in distinct media above, which must be achieved in order for the remedy to achieve RAOs.

The PRGs for the SEWP Site were based on specific chemical-based ARARs and risk based, if standards do not exist. The PRGs for the Site are listed in Table 4. The final cleanup levels will be selected and presented in the ROD.

## G. Summary of Remedial Alternatives

Based on results from the RI and BRA, the EPA determined that remedial actions would be required for the soil and sediment at the SEWP Site. To develop and focus the remedial alternative evaluation process in the FS, the Site was segregated into three separate areas called Contaminated Media Zones (CMZs). CMZs are defined by one or more of the following characteristics; lithology, COCs, depth, areal extent, and/or presence of DNAPL.

Figure 3 illustrates the three CMZs; the Main Source Area (MSA), the Secondary Source Area (SSA), and the Surficial Soil Zone (SUR). In addition to the three CMZs, the Treated Stockpile (1994), located on the central portion of the SEWP facility has specific remedial alternatives that are evaluated independently of the overall Site remedial alternatives. This is due to its waste profile and resultant limited treatment alternatives. The approximate 10,500 cy Treated Stockpile overlays portions of the MSA and SSA (Figure 3).

### Main Source Area (MSA)

The MSA represents the primary creosote DNAPL source area, including the former waste holding ponds and main processing areas (Figure 2). The creosote DNAPL presents an ongoing threat of release of contaminants into the sediments and surface water of Batchelor Creek and is principal waste material (PTW). The MSA has a large volume and extent of creosote stained soil and zones of soil saturated with free-phase and residual creosote.

**Table 4: PRGs for Chemicals of Concern**

| Chemical | Unit | Construction Worker ($10^{-6}$/$10^{-4}$ Risk)* | Utility Worker ($10^{-6}$/$10^{-4}$ Risk)* | EPA Site-specific Risk-based Action Levels Industrial. ($10^{-5}$ Risk) |
|---|---|---|---|---|
| | | Soil | | Soil (Sediment) |
| BaP TEQ | µg/kg | 1900 / 190,000 | 620 / 62,000 | 2,400 |
| 2,3,7,8-TCDD TEQ | ng/kg | 160 / 16,000 | 53 / 5,300 | 230 |

**Notes:** * - Risk based levels calculated in the HHRA, Revision 1, 2015; BaP - benzo(a) pyrene; µg/kg – micrograms per kilogram; TCDD - tetrachlorodibenzo-p-dioxin (dioxin); ng/kg – nanograms per kilogram; TEQ - toxic equivalent; Sediment to be remediated as soil

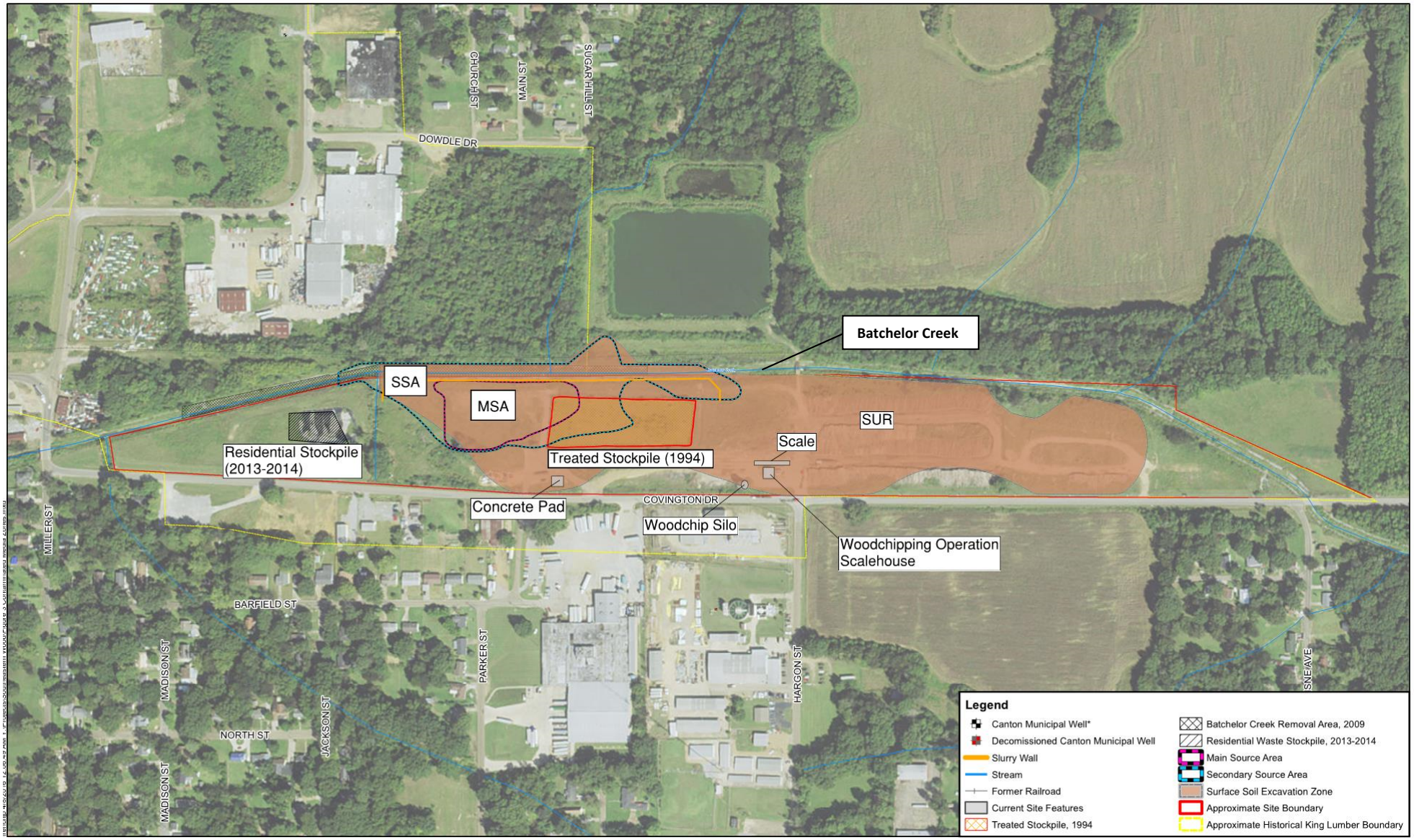


**Figure 3: MSA, SSA and SUR Contaminated Media Zones for Southeastern Wood Preserving Superfund Site**

As mentioned above, these contaminated soils are considered to contain RCRA Listed hazardous wastes (K001, F032 and F034) due to previous creosote and PCP wood preserving processes conducted at the facility. It is underlain by a very thick and competent clay zone, encountered between 32 to 35 ft bls and there are no surface obstructions. The MSA is ideally suited for isolation/containment or an aggressive remedial treatment.

**Secondary Source Area (SSA)**

The SSA includes a lower mass of DNAPL and creosote-stained soil (as compared to the MSA) over a larger and more shallow (0 to 20 ft bls) area outside the extent of the MSA (Figure 3). The SSA also incorporates any remaining DNAPL within or beneath Batchelor Creek sediments. The DNAPL present in this zone constitutes also constitutes PTW. The SSA includes the entire existing interim **slurry** cutoff wall parallel to Batchelor Creek. The SSA is also underlain by the Yazoo Zone C clay at approximately 34 ft bls. The SSA is ideally suited for isolation/containment or aggressive remedial treatment to treat the source.

**Surficial Soils Zone (SUR)**

The SUR zone represents on-facility surficial soils impacted with PAHs, and dioxin above remedial goals. The SUR encompasses Western, Central and Eastern parcels of the facility, as shown on Figure 3. About 67,000 cy of soil extending between 0 to 2 ft bls over 20.7 acres of the facility is designated as the SUR zone. There is an additional 1,703 cy of soil contained in the western Residential stockpile that will be included in this area. Treatment of dioxin wastes in particular are considered prohibitively expensive and complex. However, the shallow extent of the majority of the soils lends itself to excavation approaches.

**Treated Stockpile**

The residual lagoon sludge waste and contaminated soil in the Treated Stockpile was previously determined by EPA as containing K001 RCRA listed waste. The lagoon sludge and soil was excavated, stored, treated on-site and placed in a lined containment cell in 1994 as part of a Removal Action. Under EPA policy and RCRA regulations for generation (i.e., removal from the ground), ex-situ treatment and placement of RCRA hazardous wastes as part of a CERCLA remedy, waste/soil considered RCRA listed hazardous waste must meet LDR treatment standards and must be disposed of in a RCRA Subtitle C landfill unless the EPA determines that the treated waste/soil “no longer contains” the RCRA listed waste. Current EPA guidance recommends that contained-in determinations be made based upon direct exposure using reasonable maximum exposure scenario and that conservative health-based standards be used to develop site-specific health-based levels of hazardous constituents below which contaminated environmental media (i.e., soil) would be considered to no longer contain hazardous waste.

Based on analytical data from this stockpile, it is estimated that 1/2 of the stockpile currently exhibits dioxin levels above the LDR treatment standards for contaminated soils or exceeds K001 post-treatment levels for naphthalene, pyrene, and phenanthrene and will therefore require off-site treatment at a RCRA approved treatment, storage and disposal (TSD) facility. The other half of the Treated Stockpile meets LDR treatment standards and no longer exceeds K001 post-treatment levels based on the sampling analysis performed during the ESI and RI. Contaminated soil that EPA determines to “no longer contain” RCRA listed wastes by comparing the concentration of RCRA hazardous constituents (e.g., naphthalene, pyrene, and phenanthrene) to conservative health based levels derived by EPA and meet the RCRA LDR treatment standards can be disposed of at a Subtitle D landfill. Contaminated soil that does not meet RCRA LDR treatment standards and is not eligible for a contained-in determination due to elevated levels of RCRA hazardous constituents will be disposed of at an off-site permitted RCRA Subtitle C landfill that EPA determines acceptability under the Off-site rule at 40 CFR 300.440.

A summary of the remedial alternatives retained for evaluation for each CMZ and the Treated Stockpile is presented in this section. A detailed screening and comparative analysis of the potential remedy alternatives is included in the *Feasibility Study Report, Revision 1*, April 2016, located in the Administrative Record in the Information

Repositories at the Canton Public Library and EPA's Records Center in Atlanta, Georgia.

## No Action Alternative
## Estimated Cost: $210,000 over 30 years

Section 300.430(e)(6) of the NCP directs that a "No Action Alternative" be developed for all FSs to provide a baseline scenario to compare all other alternatives against. The No Action Alternative can typically only include compliance monitoring. In general, the alternative is applicable when there is no current or potential threat to human health and the environment or when Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) exclusions preclude taking an action. Under No Action Alternatives, no funds are expended for control or remediation of the contaminated media. Funds are required for the statutory Five-Year Reviews (FYRs) of the Site for site visits, minimal compliance sampling and analyses of select contaminated media, review of regulatory changes, and report preparation.

## Main Source Area (MSA) Alternatives

Remediation of the creosote DNAPL in the MSA was deemed a critical RAO as it represents a PTW. The creosote DNAPL presents an ongoing threat of release of contaminants into the sediments and surface water of Batchelor Creek. The five remedial alternatives developed for the MSA are:

### MSA Alternative 1: No Action

Estimated Capital Costs: $0
Estimated Annual O&M Costs:$5,700
Estimated Present Worth Costs: $171,000
Estimated Construction Timeframe: 0
Estimated Time to Achieve RAO/Cleanup Levels: N/A

Under the no action alternative, no action is taken to remediate contaminated soil. This CMZ would remain in its present condition. Minimal periodic sampling and analysis of COCs in surface water, sediments, or soil would be used to track contaminant concentrations over the course of a 30-year monitoring period; this information will facilitate evaluation of the conditions at the CMZ for the FYR.

### MSA Alternative 2: Barrier Wall and Cap

Estimated Capital Costs: $2,000,000
Estimated Annual O&M Costs: $17,520
Estimated Present Worth Costs: $1,997,700
Estimated Construction Timeframe: 2 yrs
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

MSA Alternative #2 consists of installing a subsurface barrier wall surrounding the MSA and a low permeability cap and cover. This containment system involves constructing a top, base, and side boundaries to surround the contaminated soil within the MSA. The approximate 1,325 linear ft wall would extend approximately to 40 ft below nominal ground surface and be keyed 3-ft into the Yazoo Zone C clay. The isolation cell would encompass an estimated 115,000 cy of creosote-impacted and stained soils. The wall thickness would be approximately 3-ft. A composite cap consisting of a geosynthetic clay/geomembrane liner and a nominal 2-ft clean soil cap (18-in. of fill and 6-in. topsoil) would be placed over the MSA to prevent infiltration of surface water into the containment system.

The geocomposite cap will comply with the RCRA Subtitle C landfill cover that are considered relevant and appropriate for a containment remedy involving soils contaminated with RCRA Listed waste and DNAPL. The edges of the liner would be anchored on all sides and secured in the creek bed. Stormwater controls and long-term monitoring of the remedy would be required.

### Alternative 3: Engineered Containment Cell (ECC)

Estimated Capital Costs: $2,700,000
Estimated Annual O&M Costs: $17,520
Estimated Present Worth Costs:$2,718,800
Estimated Construction Timeframe: 2 yrs
Estimated Time to Achieve RAOs/Cleanup Levels: 30

MSA Alternative #3 consists of a full isolation remedy to contain the DNAPL-impacted soils. This alternative consists of excavating contaminated soils within the MSA, to allow placement of 40-mil high density polyethylene (HDPE) liner on the bottom and side over a geonet material. Contaminated soil excavated will be placed back into the lined cell and covered with a composite cap. The ECC would be constructed to an average depth of 34 ft bls the approximate top surface of the Yazoo Zone C clay. The isolation cell would encase about 151,000 cy of soil and contaminated soils in an area of about 91,000 $ft^2$ (2.1 acres).

A composite cap with a geosynthetic clay liner/ geomembrane, with a nominal 2-ft clean soil cap (18-in. of fill and 6-in. of topsoil) would be placed over the cell to prevent infiltration of surface water (identical to MSA #2). The cap would terminate in an anchor trench surrounding the sidewall liner. Stormwater controls and long-term monitoring of the remedy would be required. The engineered containment cell would be constructed to meet RCRA corrective action management unit (CAMU) requirements for disposal of remediation wastes that are considered ARARs for this remedial alternative.

### Stabilization (S/S), On-Facility Disposal

Estimated Capital Costs: $9,900,000
Estimated Annual O&M Costs: $17,520
Estimated Present Worth Costs: $9,878,600
Estimated Construction Timeframe: 2 yrs
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

### MSA Alternative 4: Excavation, *Ex-Situ* Soil

Alternative MSA #4 consists of excavating contaminated soils within the MSA, followed by *ex situ* solidification and stabilization (S/S) treatment and backfilling with the treated soil. S/S treatment typically involves mixing Portland cement with contaminated soils to chemically immobilize the COCs. Contaminated soil would be excavated to the areal and depth extents of the MSA. Approximately a total of 145,000 cy of creosote-impacted and stained soils would be solidified / stabilized. After the treated soil is placed into the excavation area, it would be covered with a clean 2-ft clean soil cover. The stabilized soil will have a low permeability, usually less than $1x10^{-6}$ centimeters per second (cm/sec). This alternative minimizes potential leaching and dissolution of DNAPL in the soil matrix (due to surface water infiltration or upwelling from groundwater. Prior to implementation bench scale and pilot scale testing would be required. Stormwater controls and long-term monitoring of the remedy would be required. The disposal site would be designated a RCRA CAMU and required to meet the alternative design requirements for disposal of remediation wastes that are considered ARARs for this remedial alternative.

### MSA Alternative 5: Excavation, *Ex situ* STARx Treatment, On-Facility Disposal

Estimated Capital Costs: $24,900,000
Estimated Annual O&M Costs: $17,520
Estimated Present Worth Costs: $24,942,000
Estimated Construction Timeframe:2 yrs
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

Alternative MSA #5 consists of excavating contaminated soils within the MSA, followed by *ex situ* treatment using the STARx smoldering process. This alternative uses treatment, STARx, to effectively destroy the DNAPL and adsorbed phase contamination in the soil. The DNAPL would be the fuel for the smoldering process with injected oxygen used to regulate the reaction. Contaminated soil would be excavated to the areal and depth extent of the MSA. A total of 145,000 cy of creosote-impacted and stained soils would be excavated and treated. Treated soil would be placed back into the excavation area and covered with a 2 ft thick clean soil/vegetative cover.

STARx is capable of near total soil treatment (>99% removal); however, the technology is unproven at full-scale. It is an emerging technology that requires a sole-source vendor. Implementation of this technology at the SEWP Site would require a bench scale test and subsequent pilot test to confirm and optimize implementation. The disposal site would be designated a RCRA CAMU and required to meet the alternative design requirements for disposal of remediation wastes that are considered ARARs for this remedial alternative.

## Secondary Source Area (SSA) Alternatives

The four remedial alternatives developed for the SSA are:

### SSA Alternative 1: No Action

Estimated Capital Costs: $0
Estimated Annual O&M Costs: $4,763
Estimated Present Worth Costs:$142,884
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: N/A

This remedy is analogous to the No Action Alternative MSA #1

### SSA Alternative 2: Barrier Wall with Cap and Limited Excavation

Estimated Capital Costs: $5,500,000
Estimated Annual O&M Costs: $4,742
Estimated Present Worth Costs: $5,484,400
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

Alternative SSA #2 is analogous to the Barrier Wall with Cap alternative described in MSA #2, however this alternative consists of a longer barrier wall (3,030 linear ft) constructed surrounding a 7.9 acre portion of the SSA, *inclusive of the areal and depth extents of PTW in the MSA*. This alternative eliminates the need for a separate alternative for the MSA. Shallow contaminated soil from areas located outside of the barrier wall would be excavated and placed within the barrier wall. The barrier wall area would be covered with a composite low permeability cap and cover. This alternative would include consolidating the SSA into a central location that would be contained with a top, base, and the barrier wall. The 3-ft wide barrier wall would be installed to a depth of approximately 40 ft bls (keying a minimum of 3-ft into the Yazoo Zone C clay). The barrier wall would enclose approximately 36,300 cy of creosote-impacted and stained soils from outside the wall area in addition to the 343,000 cy within the barrier wall. If feasible, any soils within the barrier wall that are determined to be clean (meeting PRGs) will be removed and relocated on the facility to allow for a lower mound height within the barrier wall area. Excavated areas outside the barrier wall would be backfilled with clean soil either from on-site or off-site sources. Creek sediments would be replaced with clean fill. Riprap rock from the creek banks would be reused following placement of fill. A grade elevation increase (mounding) of 5.3-ft would result from the addition of the excavated soils into the barrier wall (assuming no clean fill is excavated from within the cap area). This mound height volume includes the soil outside the barrier wall and the entire Residential soil stockpile (1,703 cy).

A composite cap (e.g., a geosynthetic clay liner/geomembrane) identical to the one described in MSA Alternative #2 would be installed across the surface of the SSA to prevent infiltration of surface water into the containment system. The cap would have a cover fill thickness of 18-inches plus a 6-inch topsoil cover. The geocomposite cap will comply with the RCRA Subtitle C landfill cover requirements that are considered relevant and appropriate for a containment remedy involving soils contaminated with DNAPL. Stormwater controls and long-term monitoring of the remedy would be required.

### SSA Alternative 3: Excavation, *Ex-situ* S/S, On-Facility Disposal

Estimated Capital Costs: $8,000,000
Estimated Annual O&M Costs: $17,520
Estimated Present Worth Costs: $8,023,100
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

Alternative SSA #3 is analogous to the S/S remedy alternative MSA #3 and consists of excavating contaminated soil within the entire SSA, followed by *ex-situ* S/S treatment, and backfilling the excavated area with the treated soil. The stabilized soils will have a low permeability, usually less than $1x10^{-6}$ cm/sec. This alternative would minimize leaching and dissolution of DNAPL in the soil matrix. The soil would be excavated to the areal and depth extent of the SSA (ranging from 7 to 20-ft bls). A total of 117,000 cy of creosote-impacted and stained soils would be S/S'd. Once backfilled with treated soils the excavated area would be covered with clean 2-ft soil/vegetative cover. Stabilized creek sediments would not be returned to the creek; instead clean fill would be used for creek restoration. Riprap rock from the creek banks will be reused following placement of clean back fill.

Bench scale testing of the unsaturated soil is critical to optimize the S/S design for leachability reduction and permeability reduction. A small-scale pilot test may be performed to further establish the design criteria.

### SSA Alternative 4: Chemical Enhanced Oil Recovery (CEOR) / Enhanced Multi-Phase Extraction (MPE) and Bioremediation

Estimated Capital Costs: $6,900,000
Estimated Annual O&M Costs: $131,988
Estimated Present Worth Costs: $6,944,200
Estimated Construction Timeframe: 2

Estimated Time to Achieve RAOs/Cleanup Levels: 10 yrs

Alternative SSA #4 is a hybrid treatment remedy that would provide chemically enhanced multi-phase extraction (MPE) recovery of DNAPL and chemical enhanced oil recovery (CEOR). CEOR will be used to augment MPE. MPE unaided would leave behind DNAPL mass and residual DNAPL. Incorporating CEOR will significantly increase DNAPL removal rates and efficiencies; however, some residual DNAPL would still persist. This alternative would require the installation of an estimated 274 MPE wells on 25-ft spacing. The DNAPL, pore water, and subsurface air would be extracted through these wells using a high vacuum pump and conveyed to an oil/water separator and air-water separator to recover these fluids. Recovered DNAPL would be sent to a fuel blending facility or waste disposal facility.

The third phase of this Alternative is longer term bioventing using the MPE wells to treat any residual DNAPL and adsorbed phase COCs in the soil. Vapors are extracted at a lower vacuum and flowrate to provide an economical means for moving air through the formation. The influx of oxygen would then support aerobic bioremediation of the SVOC and BaPs.

Implementation of this technology would require a bench scale test and subsequent pilot test to confirm and optimize both the CEOR/MPE and *in situ* enhanced bioremediation (ISEB) components of the remedy.

## Surficial Soils Zone (SUR) Remedial Alternatives

The five remedial alternatives developed for the SUR are:

### SUR Alternative 1: No Action

Estimated Capital Costs: $0
Estimated Annual O&M Costs: $3,949
Estimated Present Worth Costs:$118,476
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: N/A

The SUR Zone No Action Alternative is equivalent to the MSA #1 and SSA #1, No Action alternatives.

### SUR Alternative 2: Excavation and On-Facility Disposal/Encapsulation

Estimated Capital Costs: $1,500,000
Estimated Annual O&M Costs:
Estimated Present Worth Costs:
Estimated Construction Timeframe:
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

Alternative SUR #2 consists of excavating impacted surficial soil on the facility and consolidating it to the into the containment area of the SSA remedy.

The total volume of the SUR zone soil is 67,000 cy. A volume of 22,500 cy of the SUR zone volume is within the SSA#2 barrier wall extent. Contaminated soil in the SUR area would be excavated and consolidated within the SSA barrier wall and cap. A surface composite cap consisting of a geosynthetic clay liner (GCL) and 2 ft of clean fill cover would be installed above the contaminated soil as described for Alternative SSA #2. The cap would comprise an area of about 343,000 $ft^2$ or 7.9 acres. The resulting elevation change, inclusive of the 2-ft cover, would be approximately 8.8-ft. The surface across the Site would be sloped to the north, west and east with ultimate drainage to Batchelor Creek for stormwater runoff. Stormwater controls and long-term monitoring of the remedy would be required. A stormwater pond may be necessary as part of the overall facility stormwater management plan. Stormwater controls and long-term monitoring of the remedy would be required.

### SUR Alternative 3: Excavation, Disposal at Subtitle D Landfill

Estimated Capital Costs: $6,500,000
Estimated Annual O&M Costs: $119,463
Estimated Present Worth Costs: $6,489,200
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

Alternative SUR #3 is similar to Alternative SUR #2, except that a portion of the excavated soil would be transported off-site to a landfill. This Alternative assumes that 66% of the SUR soils (inclusive of the Residential Stockpile) could be taken to a subtitle D landfill (45,315 cy). Any soil that does not comply with the Subtitle D Requirements would be placed within the SSA #2 Barrier Wall area. No buildings and surface structures would require demolition for this Alternative. Excavations will be backfilled with

clean soil, compacted and graded for proper surface water drainage.

### SUR Alternative 4: Excavation, *Ex-situ* S/S, On-Facility Disposal

Estimated Capital Costs: $6,200,000
Estimated Annual O&M Costs: $119,463
Estimated Present Worth Costs: $6,165,000
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

This remedy is analogous to Alternative SSA #3 S/S remedy. Alternative SUR #4 includes excavating 69,000 cy of SUR zone soil followed by *ex-situ* S/S treatment, and backfilling the excavated area with the treated soil. The contaminated soil would be excavated to 2-ft bls. This alternative may be equally feasible as an *in-situ* S/S approach. The S/S reagent slurry would be prepared in a batch plant on-facility and S/S mixing will be conducted either via an excavator, within a roll off container, or with specialized soil blending equipment. Treated soil would be covered with a nominal 2-ft of soil/ vegetative cap. Expansion of soil would be less than 10% from the amendments. No buildings and surface structures would require demolition for this alternative. Stormwater controls and long-term monitoring of the remedy would be required. A stormwater pond may be necessary as part of the overall facility stormwater management plan.

### SUR Alternative 5: Surface Liner and Clean Cover

Estimated Capital Costs: $5,300,000
Estimated Annual O&M Costs: $119,463
Estimated Present Worth Costs: $5,259,800
Estimated Construction Timeframe: 2
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

Alternative SUR #5 includes spreading and grading the Residential stockpile soil out across the contaminated portions of the facility and covering the existing surficial soil contamination in the Central and Eastern parcels with a Geosynthetic Clay Liner (GCL) and a nominal 2-ft soil/vegetative cap. This alternative would contain a total of 69,000 cy of contaminated soils. All soils would be compacted prior to placement under the GCL, cover, and vegetative cap. The GCL would be installed across the surface to prevent infiltration of surface water and potential leaching of the COCs. The surface would be sloped to the north east and west to ultimately drain to Batchelor Creek for storm water runoff. Clean soil would be used over the GCL to add the 2-ft cover soils. A grade elevation of approximately 2-ft would be produced across the majority of the facility. The cap would have a 2 ft soil/vegetative cover. A stormwater pond may be necessary as part of the overall facility stormwater management plan. Stormwater controls and long-term monitoring of the remedy would be required.

## Treated Stockpile/Containment Cell Alternatives

The Treated Stockpile waste has two remedial alternatives:

### Treated Stockpile (TS) Alternative 1: Off-site Treatment and Disposal at TSD facility; Off-site Disposal at Subtitle C Landfill

Estimated Capital Costs: $7,500,000
Estimated Annual O&M Costs: $0
Estimated Present Worth Costs: $7,475,000
Estimated Construction Timeframe: 1yr.

Estimated Time to Achieve RAOs/Cleanup Levels: 1 yr

This alternative is for off-site transport, treatment via incineration and disposal at an approved RCRA hazardous waste TSD facility of an estimated 5,250 cy in the eastern half of the stockpile that exceeds the dioxin LDR treatment standards for contaminated soils and K001 post-treatment levels. The RCRA LDR treatment standards are considered ARARs for this remedial alternative. The sampling and analysis performed during the ESI and RI indicate that the western portion of the waste pile no longer exceeds LDR treatment standards for contaminated soils and no longer exceeds K001 post-treatment levels. Under this alternative the western half of the Treated Stockpile will be evaluated by EPA to determine whether the soil pile "no longer contains" RCRA Listed hazardous waste by comparing the concentration of RCRA hazardous constituents (e.g., naphthalene, pyrene, and phenanthrene) to conservative health based levels derived by EPA. If EPA determines the contaminated soil no longer contains RCRA Listed waste, then then it can be managed in accordance with the RCRA Subtitle D (solid waste) requirements and /or State of MS solid waste requirements and disposed of in an off-site permitted RCRA Subtitle D landfill. Alternatively, this western portion of the Treated Stockpile could remain on-site and be consolidated with other contaminated soils and contained under an engineered cap.

### Treated Stockpile (TS) Alternative 2: Off-site Treatment and Disposal at a TSD facility; On-facility Encapsulation in a RCRA CAMU.

Estimated Capital Costs: $5,000,000
Estimated Annual O&M Costs: $0
Estimated Present Worth Costs: $5,074,700
Estimated Construction Timeframe: 2 yrs.
Estimated Time to Achieve RAOs/Cleanup Levels: 30 yrs

This alternative includes off-site transport, treatment via incineration and disposal at an approved RCRA TSD facility of an estimated 5,250 cy in the eastern half of the stockpile that exceeds the dioxin LDR treatment standards and K001 post-treatment standards. The RCRA LDR treatment standards are considered ARARs for this remedial alternative.

This alternative also includes on-site placement of the western 5,250 cy in an on-site Corrective Action Management Unit (CAMU) in the event that EPA determines that the contaminated soil is considered to contain RCRA Listed hazardous waste due to

**CRITERIA FOR EVALUATING REMEDIAL ALTERNATIVES**

In selecting a preferred cleanup alternative, EPA uses the following criteria to evaluate those screened in the **Feasibility Study (FS)**. The first two criteria are threshold criteria and must be met for an option 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. All nine criteria are explained in more detail here.

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)** – Compliance with Federal/State standards and requirements that pertain to the site or whether a waiver is justified.
3. **Long-Term Effectiveness and Permanence** – Protection of people and environment after cleanup is complete.
4. **Implementability** – Technical feasibility and administrative ease of conducting a remedy, including factors such as availability of services.
5. **Reduce Toxicity, Mobility, or Volume by Treatment** – Evaluates the alternative's use of treatment to reduce the harmful effects of principal contaminants and their ability to move in the environment.
6. **Short-Term Effectiveness** – Length of time to achieve protection and potential impact of implementation.
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.

the elevated concentrations of RCRA hazardous constituents above health-based levels derived by EPA. A CAMU is a RCRA land-based unit for on-site TSD of remediation waste. The design of the CAMU for disposal will meet alternative site-specific standards per 40 CFR 264.552 (e)(3)(ii) and soils will meet alternative soil treatment requirements as provided in 40 CFR 264.552(e)(4)(iv) which are considered ARARs . The CAMU will be designated in the ROD signed by the EPA Region 4 Superfund Division Director along with the justification for any alternative design and treatment standards as required by the ARARs. The CAMU will require long term monitoring and maintenance of the cap/cover. A stormwater pond may be necessary as part of the overall facility stormwater management plan. Long-term monitoring of the remedy would be required.

### H. Evaluation of Alternatives

The NCP establishes a framework of nine criteria for evaluating remedial alternatives. These nine criteria shown in the text box were used to evaluate the remedial alternatives individually and against each other to identify a Preferred Alternative(s). If an alternative does not meet the first two threshold criteria; Overall Protection of Human Health and the Environment and Compliance with ARARs, EPA does not consider the alternative for further evaluation. The EPA will recommend the cleanup alternative that provides the best balance of the first seven of the nine evaluation criteria. EPA, after considering State (MDEQ) acceptance and public comments received on this proposed plan, will select the final remedy in the ROD.

## Comparison of the Alternatives to the EPA Criteria

The objective of this section is to compare and contrast the remedial alternatives for each CMZ and the Treated Stockpile area so that risk managers may select a preferred alternative.

## Overall Protection of Human Health and the Environment

All of the CMZ and TS alternatives, except the No Action alternatives, are protective of human health and the environment by eliminating, reducing, or controlling risks posed by Site COCs through treatment of the contaminants, containment, engineering controls, and/or **institutional controls**. Alternatives that include Excavation and Off-Facility Disposal (MSA#4, SUR#3, TS#1), provide the highest level of protection because it physically removes some of the contaminated soil from the Site.

## Compliance with ARARs

All CMZ and TS alternatives, except the No Action alternatives, are compliant with action-specific ARARs. Only MSA Alternative #5, *Ex-situ* STARx has the potential to reduce concentrations of COCs to meet PRGs. The remainder of the alternatives will contain the COCs and eliminate receptor pathways (e.g. barrier wall, *ex-situ* S/S and encapsulation).

MSA Alternatives #3, #4, #5 and SSA Alternatives #3 and #4 would be required to comply with RCRA alternative treatment standard for soils at 40 CFR 268.49 or the CAMU treatment standards at 40 CFR 264.552(e)(4) which are considered ARARs for these remedial alternatives. Also, the disposal site would be designated a RCRA CAMU and be required to meet the alternative design requirements for disposal of remediation wastes that are considered ARARs for these remedial alternatives. EPA will be evaluating the western portion of the Treated Stockpile soil to determine if the soil pile “no longer contains” RCRA Listed hazardous waste by comparing the concentration of RCRA hazardous constituents (e.g., naphthalene, pyrene, and phenanthrene) to conservative health based levels derived by EPA. If EPA determines the contaminated soil no longer contains RCRA Listed waste, then then it can be managed in accordance with the RCRA Subtitle D (solid waste) requirements and /or State of MS solid waste requirements and disposed of in an off-site permitted RCRA Subtitle D landfill. The “no longer contains” process would only affect the 2 alternatives for the stockpile. The RCRA Subtitle D (solid waste) closure requirements, rather than Subtitle C requirements, will be ARARS for this portion of the treated stockpile.

## Long-Term Effectiveness and Permanence

Each alternative, except the No Action alternatives, provide some degree of long-term protection. Alternative MSA #5 is most effective, but is not a proven technology. SSA #2, SUR #2, SUR #3, and TS#1 are more effective than the other alternatives

because isolating or removing contaminated soil is most effective way to eliminate long term risk to potential receptors.

Reviews at least every five years, as required, would be necessary to evaluate the effectiveness of all of the alternatives, with the exception of SUR #2, because hazardous substances would remain on-facility in concentrations above health-based levels.

**Cost Definitions**

- Capital Cost is the cost to construct a remedial action.
- Present Worth Cost is the total cost across the lifespan of the remedial action including the initial capital cost plus any continuing operation and maintenance costs estimated over 30

### Implementability

All of the treatment alternatives are easily implemented. All materials and services needed for implementation are readily, commercially available. The site logistics of implementation increase in difficulty as more treatment components are added in each alternative. The most difficult remedy to implement would be MSA#5 because the STARx process only has one vendor capable of implementing this technology. The most uncertainty lies with SSA#3 because there is a potential soil blending concern due to clayey soils.

### Short-Term Effectiveness

All alternatives would pose potential risks to construction workers and the community during barrier wall installation, excavation, and/or treatment of soils except the No Action alternatives. The potential risks would be primarily associated with equipment movement and exposure to contaminated dust. However, air monitoring on facility and at the site boundary, engineering controls and construction best management practices would control or reduce the potential for exposure. Workers would be required to wear appropriate levels of protection to avoid exposure during excavation and treatment activities.

### Reduce Toxicity, Mobility or Volume through Treatment

Alternatives SSA #2, SSA #3, SSA #4, SUR #1, SUR #2, SUR #3, SUR #4, and TS#1, do not include treatment as a component of the remedy. Therefore, these alternatives would not reduce the toxicity, mobility, or volume of contamination at the site. Alternatives SUR#3 and TS#1 provides the greatest reduction in mobility, by removing the contaminated soil to a landfill.

### Cost

Cost estimates, including capital costs and long-term operating costs, were prepared for each alternative. There are no capital costs associated with the No Action Alternatives; present worth costs for this alternative are estimated at $35,000 per five year period to conduct a FYR at the Site or $210,000 for an estimated 30 years of monitoring. The No Action Alternative would not be protective of human health and the environment.

The MSA Alternatives range from $2M to $24M, with MSA #5; STARx as the most costly alternative.

**EPA's Preferred DNAPL/Soil/Sediment Remedial Alternatives**

- Alternative SSA #2; Barrier Wall with Cap and Limited Excavation (encompasses the MSA)
- Alternative SUR #2; Excavation and On-facility Encapsulation
- Alternative TS#1; Off-site Disposal

The SSA alternatives are all comparable in costs ranging from $5.5M to $8M. The SUR alternatives range from $3M to $8M.

### State Acceptance

The State of Mississippi has been involved actively in the process of determining and evaluating the SEWP cleanup alternatives presented in this Proposed Plan. State acceptance will be described in the ROD and **Responsiveness Summary**.

### Community Acceptance

This Proposed Plan provides the opportunity for the public to make comments to EPA on the Preferred Alternative as well as the other alternatives presented and evaluated in this plan for the SEWP Site. Community acceptance of the Preferred Alternative will be evaluated after the public comment period and will be described in the ROD and Responsiveness Summary.

## I. EPA's Preferred Alternative

The MDEQ is in agreement with the Preferred Alternative; however, the preferred remedies may be modified based on public comment.

The Preferred Alternative is a combination of alternatives from two CMZs; SSA and SUR zones and the Treated Stockpile (1994). A specific remedy was not selected for the MSA as the entire zone (DNAPL mass) will be incorporated into the Preferred Alternative for the SSA. Figure 4 illustrates the Preferred Alternative for SSA #2; SUR #2, and TS #1. Based on the information available at this time, EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance among the other alternatives with respect to the balancing and modifying criteria.

**Alternative SSA #2**; **Barrier Wall with Cap and Limited Excavation**, consists of a barrier wall that will encompass the areal and depth extent of the MSA and the SSA, with the exception of some subsurface soil that lies outside the perimeter of the barrier wall.

**Alternative SUR #2; Excavation and On-Facility Encapsulation** will encapsulate the shallow surficial soil from the facility and provide a repository for additional high level dioxin and BaP contaminated surficial soil. The impacted surface soil will be placed within the SSA#2 Barrier Wall and Cap. Soils from the western Residential Stockpile would either be placed within the barrier wall or used as clean fill if sampling shows that it is acceptable for cover purposes.

**Alternate TS #1**; **Off-site Treatment and Disposal at TSD facility; Off-site Disposal at Subtitle C Landfill** is recommended for the Treated Stockpile due to its classification as a K001 listed waste and requirement to comply with RCRA ARARs for treatment and disposal of hazardous waste. As described above, the eastern portion of the pile requires further treatment in order to meet RCRA LDR treatment standards which will be performed at an off-site RCRA TSD followed by disposal in a RCRA Subtitle C landfill. The western portion of the pile that meets RCRA LDR treatment standards will be evaluated by EPA to determine whether the soil pile "no longer contains" RCRA Listed hazardous waste by comparing the concentration of RCRA hazardous constituents (e.g., naphthalene, pyrene, and phenanthrene) to conservative health based levels derived by EPA. If EPA determines the contaminated soil no longer contains RCRA Listed waste, then then it can be managed in accordance with the RCRA Subtitle D (solid waste) requirements and /or State of MS solid waste requirements and disposed of in an off-site permitted RCRA Subtitle D landfill.

Protection of human health and the environment will be achieved by containment of the creosote DNAPL and contaminated soils and preventing future migration of hazardous substances into Batchelor Creek. Encapsulating contaminated surface soil will eliminate potential risk to humans and animals. Moreover, off-site treatment and disposal of the eastern portion of the Treated Stockpile as well as the off-site disposal of the western portion of the Treated Stockpile removes a source of contamination and attains RCRA ARARs. Compliance with ARARs will be achieved through isolation and encapsulation of PTW (DNAPL) and dioxin/PAHs impacted soil that meet RCRA Subtitle C landfill final cover and off-site treatment and disposal of the hazardous waste in the Treated Stockpile that meets RCRA ARARs for treatment and disposal of hazardous waste. Long term effectiveness and permanence will be attained by long term isolation and encapsulation of contaminated soil/sediment. Barrier wall and composite caps are proven remedial treatment methods with long life cycles.

Implementability is easily achieved for these alternatives. There are no obstructions, a large site area and a very competent thick clay to serve as the bottom of the isolation/containment cell.

Reduction in toxicity, mobility, and volume (T/M/V) are not all achievable with these alternatives. Isolation reduces mobility, but does not reduce toxicity or volume, but it does eliminate the risk exposure pathway.

The total present worth of EPA's Preferred Alternative is $14.8 million.

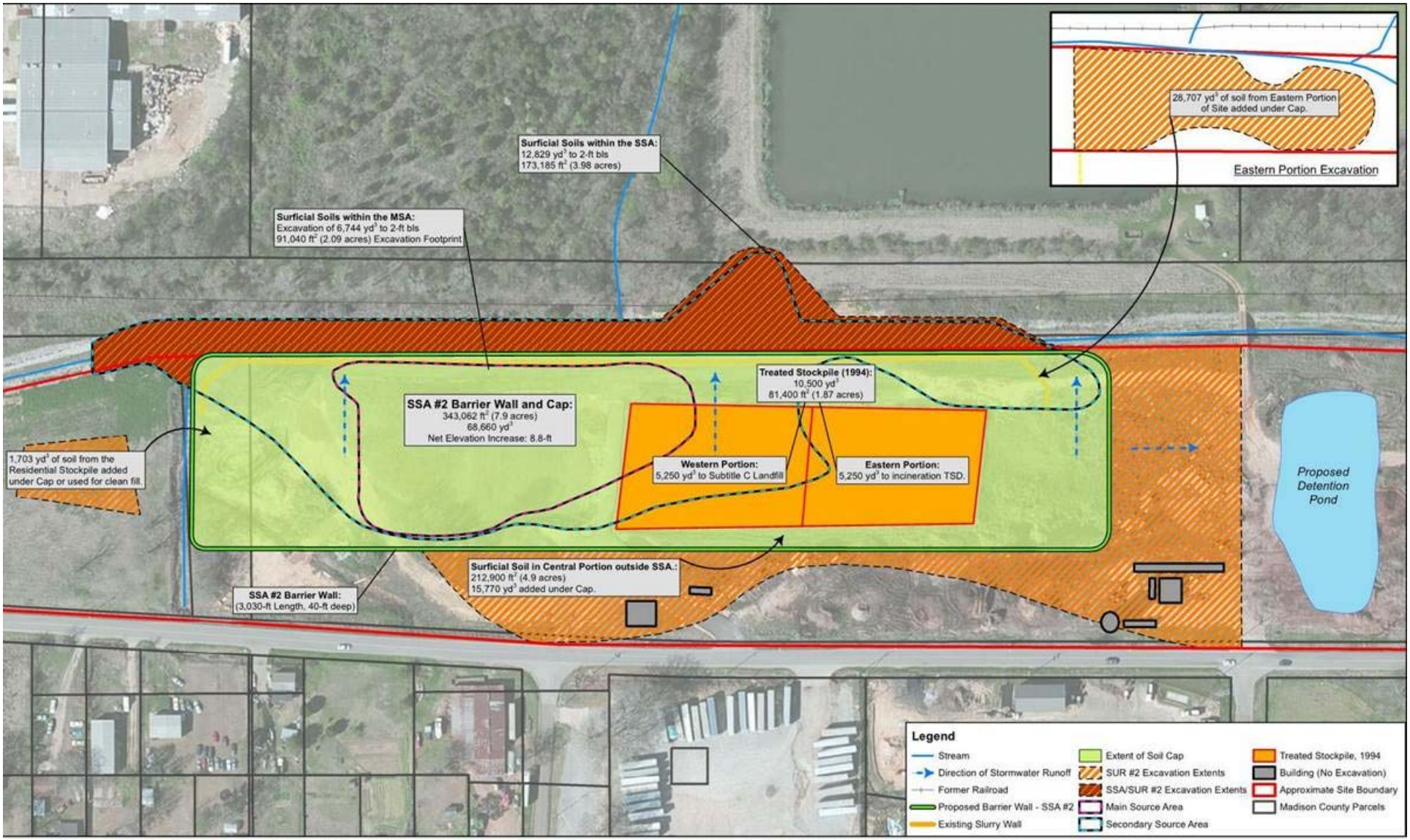


**Figure 4: Preferred Alternative for SSA #2, SUR #2 and TS #1 for Southeastern Wood Preserving Superfund Site**

**Institutional Controls** (ICs) will be required as part of the selected remedy. ICs are non-engineering measures which usually include legal controls to affect human activities in such a way so as to prevent or reduce exposure to contamination. The purpose of the ICs is to impose on the subject property "use" restrictions for the purpose of implementing, facilitating and monitoring a remedial action to reduce exposure, thereby protecting human health and the environment. The SEWP properties would have ICs implemented to prohibit intrusive work and site uses on the SEWP properties.

Permanent access to the property shall be granted to EPA and MDEQ and their agents and/or representatives.

**Community Participation**

The EPA relies on public input to ensure the concerns of the community are considered in selecting an effective remedy for each Superfund Site. The **Administrative Record** and Information Repositories for the SEWP Site are located at:

Canton Public Library
102 Priestley Street
Canton, MS 39046
Phone: 601-589-3202
Hours: Mon, Wed 9am – 6pm; Tues, Thurs 9am – 7pm; Fri, Sat 9am-5 pm

USEPA Region 4
Records Center
61 Forsyth Street
Atlanta, Georgia 30303
404-562-8946
Hours: Mon-Fri 8:00am-4:30pm

The dates for the public comment period are June 6, 2016 through July 11, 2016.

**If you prefer to submit written comments, please mail them postmarked no later than midnight June 30, 2016 to Mr. Ronald Tolliver at USEPA, 61 Forsyth Street, Atlanta, GA 30303.**

After EPA has received comments and questions during the public comment period, EPA will summarize the comments and provide responses in the **Responsiveness Summary** which is part of the ROD. The ROD will select the final remedial action and will provide the rationale for EPA's selection.

## GLOSSARY

**Administrative Record:** Materials, information and documents that provide the basis and support EPA's selection of a remedial action at Superfund sites usually placed in the **information repository** near the Site.

**Applicable or Relevant and Appropriate Requirements (ARARs):** Refers to Federal and more stringent State environmental requirements a selected remedy must attain which vary from site to site. Reference 40 CFR 300.5 Definitions of 'Applicable requirements' and 'Relevant and appropriate requirements'.

**Aquifer:** An underground geologic formation, or group of formations, containing water.

**Baseline Risk Assessment (BRA):** 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 and use of specific pollutants.

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

**Cleanup:** Actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial action, removal action, response action, or corrective action.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** A federal law 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.

**Ecological Risk Assessment (ERA):** A qualitative and quantitative evaluation performed in an effort to define the risk posed to ecological receptors by the presence or potential presence of specific contaminants.

***Ex-situ*:** Out of its original place; moved or excavated.

**Groundwater**: Water located beneath the ground surface in soil pore spaces and in the fractures of lithologic formations.

**Human Health Risk Assessment (HHRA):** A qualitative and quantitative evaluation performed in an effort to define the risk posed to human health 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 is placed to allow public access to the material.

***In situ*:** In its original place; unmoved unexcavated; remaining in the subsurface.

**Institutional Controls**: Administrative, non-engineering, controls that inform and prevent exposures to human receptors.

**Monitoring:** The periodic or continuous surveillance or testing to determine the level of pollutants in various media.

**National Oil and Hazardous Substances Pollution Contingency Plan (NCP):** The federal regulation that guides the Superfund program.

**National Priorities List (NPL):** EPA's list of the most serious uncontrolled hazardous waste sites identified for possible long-term remedial response. This list is based primarily on the score a site received on the Hazard Ranking System.

**Proposed Plan**: Document that summarizes the RI/FS, the alternatives developed and the proposed preferred alternative and the rationale for its proposal.

**Public Comment Period:** The time allowed for the public to express its views and concerns on the information provided in the Proposed Plan and EPA's proposed preferred alternative.

**Record of Decision (ROD)**: A decision document that selects and describes the remedy that will be implemented at a Site. The ROD is based on information and technical analysis generated during the remedial investigation/feasibility study and consideration of public comments.

**Remedial Action (RA)**: The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.

**Remedial Action Objectives (RAOs)**: Provide a general description of what the cleanup will accomplish (e.g., restoration of ground water to drinking water levels). These goals typically serve as the as the basis for developing remedial alternatives.

**Remedial Design (RD):** The development of engineering drawings and specifications for the implementation and construction of a remedial action.

**Remedial Investigation (RI):** An investigation conducted to fully characterize the nature and extent of contamination of a release, or threat of release, of hazardous substances, pollutants, or contaminants. In addition, the RI also evaluate risks posed to human health and the environment. The RI gathers the necessary data to support the corresponding FS.

**Feasibility Study (RI/FS** and to. The FS is conducted after the RI to develop and evaluate remedial alternatives to address the risks posed by the contamination at a site.**Response Action:** A CERCLA-authorized action involving either a short-term removal action or a long-term removal response. This may include but is not limited to: removing hazardous materials from a site to an EPA-approved hazardous waste facility for treatment, containment or treating the waste on-site, identifying and removing the sources of ground-water contamination and halting further migration of contaminants.

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

**Superfund:** The common name used for the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended in 1986.

USE THIS SPACE TO WRITE YOUR COMMENTS

***Your input on the Proposed Plan for the Southeastern Wood Preserving 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.***

*Southeastern Wood Preserving Superfund Site*

**PUBLIC COMMENT SHEET**

---

Place Stamp Here

Name_____
Address_____
City_____State_____Zip_____

Shelby Johnston, Remedial Project Manager
U. S. Environmental Protection Agency, Region 4
Superfund Division
61 Forsyth St., SW
Atlanta, GA 30303