RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

CAMILLA WOOD TREATMENT (ESCAMBIA) COMPANY SUPERFUND SITE

CAMILLA, MITCHELL COUNTY, GEORGIA

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 4
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ADD	average daily dose
ARAR	applicable or relevant and appropriate requirement
BaP	Benzo(a)pyrene
Black & Veatch	Black & Veatch Special Projects Corporation
bls	below land surface
BRA	Baseline Risk Assessment
BERA	Baseline Ecological Risk Assessment
BW	body weight
Camilla Wood	Camilla Wood Treatment (Escambia) Superfund Site
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COC	chemical of concern
COPC	chemical of potential concern
cPAH	carcinogenic polycyclic aromatic hydrocarbons
CSF	cancer slope factor
CSM	conceptual Site model
CTE	central tendency exposure
cy	cubic yards
ELISA	enzyme-linked immunosorbent assay
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ET	exposure time
FS	Feasibility Study
ft/day	feet per day
5YRR	five year review report
GAEPD	Georgia Environmental Protection Division
gpm	gallons per minute
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
HRS	Hazardous Ranking System
ILCR	incremental lifetime cancer risk
LADD	lifetime average daily dose
MCL	maximum contaminant level
μg/L	micrograms per liter
μg/kg	micrograms per kilogram
mg/kg/day	milligrams per kilogram per day
M/T/V	mobility/toxicity/volume
ng/kg	nanograms per kilogram
NCP	National Contingency Plan
OSWER	Office of Solid Waste and Emergency Response
O&M	operation and maintenance
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PCP	pentachlorophenol

ppb	parts per billion
ppt	parts per trillion
PRG	Preliminary Remedial Goal
RAO	Remedial Action Objective
RD	Remedial Design
RfD	Reference dose
RG	Remedial Goal
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act
SESD	Science and Ecosystem Support Division
Site	Camilla Wood Treatment (Escambia) Superfund Site
SQL	sample quantitation limit
SRI	Supplemental Remedial Investigation
S/S	solidification/stabilization
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TEQ	toxicity equivalent quotient
UCL	upper confidence limit
VOC	Volatile Organic Compound

PART 1: THE DECLARATION

1.1 Site Name and Location

This Record of Decision (ROD) is for the Camilla Wood Treatment (Camilla Wood) Superfund Site that is located about 0.25 mile west of U.S. Highway 19 in the City of Camilla, Mitchell County, Georgia. The U.S. Environmental Protection Agency (EPA) Site Identification Number for the Camilla Wood Superfund Site is GAD008212409.

1.2 Statement of Basis and Purpose

This decision document presents the Selected Remedy for the Camilla Wood Treatment Superfund Site (the Site), located in Camilla, Georgia, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record for the Site. This decision represents the final remedy selection for the Site, and, following completion of the remedial action, the Site will be ready for reuse. In accordance with 40 Code of Federal Regulations (CFR) Section 300.430, as the support agency, Georgia Environmental Protection Division (GAEPD) has provided input during the process and concurs with the Selected Remedy.

1.3 Assessment of Site

The response action selected in this ROD is necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances to the environment.

1.4 Description of Selected Remedy

The recommended Site-wide remedial alternative is a combination of Alternative S5 – *In Situ* Stabilization, Source Containment, Monitored Natural Attenuation and Storm water Improvements and Alternative GW2 – *In situ* Chemical Oxidation/Bioaugmentation. At a combined Site-wide cost of $13,620,280, the preferred alternative will reduce the risks of exposure to contaminant concentrations exceeding the remedial goals for the Site in both soil and groundwater. Additionally, the remedy is expected to achieve all Site Applicable or Relevant and Appropriate Requirements (ARARs) and be completed within 6 to 9 months of the start of remedial activities. Monitoring of groundwater would need to continue beyond completion of construction activities. The Selected Remedy is compatible with the planned future use of the Site. The major components of the Selected Remedy include:

- *In situ* stabilization/solidification of contaminated soils in the source area;
- *In situ* stabilization/solidification of the top two feet of contaminated soils outside of the highly contaminated source area;
- Karst features which are found to be sources of migration from the shallow to the intermediate zone will be sealed using compression or jet grouting;
- Install a vertical barrier wall around the perimeter of the source area in the surficial aquifer;

- Monitored natural attenuation of the areas in the surficial aquifer that are located outside of the vertical barrier wall;
- Implement storm water improvements;
- *In situ* chemical oxidation and/or bioaugmentation within the contaminant plume to treat the dissolved phase contamination in the intermediate aquifer;
- Institutional controls through a restrictive covenant to limit future land use to nonresidential uses only; to prohibit potable groundwater use on the property; prohibit soil removal or digging within the boundary of the treated material; and
- Establish and implement a long-term monitoring program to assess the effectiveness of the remedial action

1.5 Statutory Determinations

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action (unless justified by a waiver), and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment to reduce toxicity, mobility, or volume as a principal element. The remedy permanently controls the mobility of the contaminated soils and is protective of groundwater resources.

Because the remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 Data Certification Checklist

The following information is included in The Decision Summary, Part 2 of this ROD. Additional information can be found in the Administrative Record file for this Site.

- Chemicals of concern (COCs) and their respective concentrations (pages 12-19);
- Baseline risk represented by the COCs (pages 20-28);
- Cleanup levels established for COCs and the basis for these levels (pages 24-25);
- How source materials constituting principal threats are addressed (pages 49-50);
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater applied in the Baseline Risk Assessment (BRA) and ROD (pages 19-20);
- Potential land and groundwater use that will be available at the Site as a result of the Selected Remedy (page 52);
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (page 47);
- Key factor(s) and that led to selecting the remedy (i.e. description of how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (page 50).

1.7 Authorizing Signatures

Franklin E. Hill, Director
Superfund Division
U.S. Environmental Protection Agency, Region 4

9/23/09
Date

PART 2: THE DECISION SUMMARY

2.1 Site Name, Location, and Brief Description

This ROD is for the Camilla Wood Treatment (Escambia) Superfund Site that is located about 0.25 mile west of U.S. Highway 19 in the city of Camilla, Mitchell County, Georgia. The Site location is shown on Figure 1. The EPA is the lead agency for this Site, and the EPA Site Identification Number is GAD008212409. Site remediation is to be conducted and financed through Superfund, with the State of Georgia's Environmental Protection Division administering a State Cost Share of ten percent of the remedial action costs.

The inactive wood treating facility is bordered by South Harney Street to the west, Thomas Street to the east, and East Bennett Street to the north (Figure 1). Residential neighborhoods are located just north of the Site and approximately 0.25 miles to the west of the Site. A Georgia Department of Transportation facility borders the facility to the southeast.

Wood treating operations began at the Site in 1947. The facility was constructed by the Louis Wood Preserving Company on approximately 50 acres of land that had been a cypress swamp. In 1950, the Escambia Treating Company purchased the property and continued wood preserving operations. In 1985, through a series of corporate reorganizations and stock transfers, International Utility and Supply Corporation assumed control of the company and facility operations. The Escambia Treating Company retained the surface impoundments and their associated environmental liabilities. At that time, the name of the operating company was changed to Camilla Wood Preserving, Inc. On February 8, 1991, Camilla Wood Preserving filed for bankruptcy protection, and on February 26, 1991, the facility closed.

2.2 Site History and Enforcement Activities

2.2.1 Operational History

Wood treating operations began at the Site in 1947 and continued until 1991. During its 44 years of wood treating operations, the facility prepared trees for treatment by debarking, cutting to size, and drilling holes. Treatment consisted of using trams to load peeled poles into two pressure treating cylinders, and then steaming the poles for 10 hours. A vacuum was then applied to the cylinders to remove water from the poles. Following the vacuum (dewatering) stage, approximately 25,000 gallons of treating solution was pumped into the treatment cylinders through aboveground pipes. The treating solution, either creosote or a solution of 10 percent PCP in diesel fuel, was forced into the poles through pressurization. The poles were treated for a variable amount of time, depending on their moisture content. After treatment, the poles were removed to the drip area located in the vicinity and south of the railroad tracks for drying and storage.

Wastewater was generated throughout the process, in particular during the steam treating process (part of the dewatering step), preservative recovery, and the cleansing of drums, storage tanks, and the production area. Initially, the wastewater was collected in unlined impoundments located in the northeastern portion of the Site. Later, the waste streams were treated in an on-Site wastewater treatment system, before being discharged to the City of Camilla's wastewater treatment plant. The location of the sewer connection is unclear.

In the 1960s, on-Site drainage was altered to channel surface water runoff and, in some cases, facility wastewater to two drainage (injection) wells located in the south-central portion of the property. These wells, which likely drained into the Upper Floridan Aquifer, were ordered sealed by the State Water Resources Control Board in October 1966. The drainage wells were reportedly plugged in 1971. An aerial photo taken during the wood treating operational period at the Site is shown on Figure 2.

2.2.2 Regulatory and Enforcement History

After facility closure in 1991, Region 4, EPA Emergency Response and Removal Branch (ERB) secured the Site by placing a fence along the perimeter. Water from a storage impoundment was pumped into a storage tank located at the wastewater treatment area. In addition, approximately 50,000 gallons of wastewater were discharged to the City of Camilla's wastewater treatment system. During Site stabilization efforts, drums were gathered and staged on-Site and the impoundment area was backfilled with on-Site soils. Approximately 25% of the impoundment area remained open and contained sludge.

In 1992, approximately 95,000 gallons of wastewater were treated on-Site, the sludge in the impoundment was solidified, and the impoundment was capped.

In 1994, EPA initiated the treatment of standing water at the Site and the dismantling of the process facility. Approximately 522,000 gallons of water were treated and discharged to an on-Site evaporation pond. Additionally, 30,723 gallons of pentachlorophenol and creosote were removed from on-Site tanks and shipped off-Site for disposal. In October 1994, approximately 5,000 cubic yards (cy) of soil were removed from a Site parking lot, an easement along Bennett Street, and four residential properties across Bennett Street based on the results of dioxin sampling, and stockpiled in a lined, bermed, on-Site staging area.

In 1995, approximately 5,000 tons of contaminated soils were shipped off-Site for disposal.

In May, June, and July 1997, under the direction and oversight of the Georgia Environmental Protection Division (GAEPD), Ecology and Environment conducted a Site Assessment (SA) to characterize soil and groundwater contamination in the extreme northeastern portion of the former Escambia Treating and Forshall Company facilities. Results indicated that elevated levels of wood treating solution compounds historically used at both facilities, were present in the underlying soil and groundwater.

A Hazardous Ranking System (HRS) Package, was prepared for the Camilla Wood Site in June of 1995. After review of the HRS Package the Camilla Wood Site was proposed to the NPL in 1998.

2.2.3 Previous Investigations

Remedial Investigation (RI) activities at the Camilla Wood Site have been ongoing since 1997. The western portion of the Site has undergone a soil removal action, and has been returned to beneficial use. In addition to the soil removal action, the drainage ditch bordering the Site has been improved including the relocation of several species which previously inhabited the ditches, removal of contaminated sediments, and general ditch cross-section improvements to enhance open channel flow.

Initial Remedial Investigation.
The initial RI to determine the nature and extent of contamination at the Camilla Wood Site was conducted by the EPA Science and Ecosystem Support division (SESD) between 1997 and 1999.

A total of 328 surface and subsurface soil samples were collected from 134 on-Site and off-Site locations. The data indicated that contamination associated with wood treating operations [polycyclic aromatic hydrocarbons (PAHs) and PCP] were present in the majority of samples collected at the Site. In addition, dioxins/furans were found in several surface soil locations. Higher levels of contamination were found in the northeastern corner of the Site in the vicinity of the ponds and in the drip track area in the northern portion of the Site.

During the initial RI, groundwater was investigated in two phases. In the first phase, 22 samples were collected and analyzed for the full Target Compound List and Target Analyte List (TCL/TAL). In the second phase, 14 additional groundwater samples were collected using a Hydrocone® groundwater sampler. These samples were analyzed for volatile organic compounds (VOCs) only.

The results of the initial groundwater investigations indicated that groundwater contamination was generally limited to the former Camilla Wood Site and the adjacent Camilla Drum Site. Again, compounds associated with wood treating operations (PAHs and PCP) dominated the list. The locations of the initial RI groundwater samples and a summary of the results are presented in the 1999 RI Report.

Surface water samples were collected at ten on-Site and off-Site locations. The pre-removal results indicated that surface water was only minimally contaminated with low concentrations of PAHs and PCP.

Sediment samples were collected at ten on-Site and off-Site locations to characterize the sediment and identify potential contamination. The pre-removal results indicated that sediment was contaminated to a lesser extent than soil. PAHs and arsenic were detected.

SupplementaryRemedial Investigation
A Supplementary Remedial Investigation (SRI) was conducted in four phases to define more precisely the extent of contamination determined during the initial RI. Phase 1 was conducted in June, September, October, and November 2002; Phase 2 was conducted in February and March 2003; Phase 3 was conducted in February, March, and May 2004; and Phase 4 was conducted in December 2006, May 2008, and February 2009.

Phases 1 and 2

Over 90 surface on-Site soil samples were collected and screened in the field. Fifteen of these samples were split and submitted to a Contract Laboratory Program (CLP) laboratory to determine the comparability of field screening data to laboratory data. PAHs were found at most locations, with the highest detections found in the drip track area in the northwest portion of the Site, within the area that was remediated by a soil removal action in 2006. PCP is a widespread contaminant in surface soil. The highest concentrations were found south of the boiler house and in the drip track area.

On-Site subsurface soil samples were analyzed for total PAHs and PCP using enzyme-linked immunosorbent assay (ELISA) screening. Twenty samples were split and sent to a CLP laboratory to determine the comparability of field screening data to fixed-base laboratory data. Concentrations of Benzo(a)pyrene (BaP) toxicity equivalents (TEQs) in excess of human health risk-based action levels are limited to two locations, E2 and G4. These 2 locations are outside of the area which has been addressed by the soil removal action. PCP was observed to be a widespread contaminant. Areas with high PCP concentrations were the penta plant east of Thomas Street, and the drip track area. These Site areas, with the exception of the former drip track area, were also outside of the area previously addressed in the soil removal action and will be addressed further in this Record of Decision.

Four subsurface soil samples were submitted to an off-Site laboratory for dioxin/furan analysis. In terms of human health, the dioxin TEQ is the most important parameter. A typical cleanup goal for dioxin at commercial or industrial facilities is in the 5 to 20 parts per billion (ppb) range, which is equivalent to 5,000 to 20,000 parts per trillion (ppt). Concentrations found on-Site ranged from 21 to 240 ppt, well below a level of concern.

In 2002,Forty-one temporary well points were set for the collection of groundwater samples. In 2002, groundwater samples were collected from the top of the water column and the bottom of the well. Samples were analyzed on-Site using immunoassay test kits or off-Site at a CLP laboratory.

In September 2002, groundwater samples were collected from 20 of the 24 existing monitoring wells.

Sampling results from the surficial aquifer show BaP TEQs and PAHs are widespread contaminants in the shallow zone; however, carcinogenic polycyclic aromatic hydrocarbons (cPAH) contamination is more localized than PAH contamination. The area east of Thomas Street, near the old penta plant, had the only two detections above the action level. The sample collected from the top of the water column at TW-F3 had the highest detections of BaP TEQs [133.8 micrograms per liter (ug/L)] and total PAHs (13,125 ug/L) of any shallow zone sample. BaP TEQs were detected at only two other locations. Total PAH contamination (as measured by concentrations above the naphthalene action level) exists in this area, but also in the northeast portion of the Site, and in a pocket south of the drip track area, in the northwest portion of the Site.

The distribution of PCP contamination in the shallow zone is similar to that of BaP TEQs and total PAHs; however, PCP contamination is more widespread than the cPAH/PAH contamination. Shallow zone PCP contamination is highest in the area east of Thomas Street and in the northeast portion of the Site.

Sampling results from the intermediate aquifer show low concentrations of PAHs are widespread in the intermediate zone. The cPAHs were not detected in any of the intermediate zone samples. Overall contamination in the intermediate zone is less widespread than that observed in the shallow zone.

Sampling results from the interemediate aquifer show PCP was commonly detected. The highest detection was in SMWI1, a well on Singleton Street, north of the Site, where PCP was detected at 75 ug/L in the primary sample and 65 ug/L in its duplicate. PCP contamination above the action level was found in three on-Site wells, but also extended north and northeast of the Site, and in the well east of Thomas Street.

Seven surface water samples were submitted for semi-volatile organic compound (SVOC) analyses. No SVOCs were positively identified in any of the samples. Two composite surface water samples were submitted for dioxin analyses. Both samples resulted in low, but detectable, concentrations of dioxin TEQ.

Seven surface sediment samples were collected for field screening. Four samples were split and sent to a CLP laboratory to determine the comparability of field screening and laboratory data. High concentrations of PAHs were detected at most locations, but no sample exceeded the BaP TEQ action level. PCP was not found above the action level. Surface sediment samples from two locations were composited with samples collected at 2 feet below land surface (bls) and submitted for dioxin/furan analysis. Concentrations of 76 and 70 ppt were found, well below a level of concern. These sediment samples were all collected from areas which were addressed during the soil removal action and the ditch improvements which occurred at the Site in 2006.

The cPAHs were detected in both subsurface sediment samples submitted to the CLP laboratory and during field screening. Location K10, collected at 2 feet bls, had the higher concentrations of cPAHs and total PAHs. The BaP TEQs measured at location K10 [24,727 micrograms per kilogram (μg/kg)] exceeded the action level of 6,900 μg/kg. As was the case for BaP equivalents and PAHs, location K10 had the highest concentration of PCP among the subsurface sediment samples. The concentration was below the action level for PCP, however. Sample location K10 was collected from within the area which was addressed during the soil removal action and the ditch improvements which occurred at the Site in 2006.

Phase 3

In February, March, and May 2004, groundwater and soil samples were collected to determine the horizontal extent of contamination in the shallow aquifer and to confirm contamination in the intermediate aquifer beneath the Site.

In the beginning of the investigation, soil and groundwater samples were screened using the ELISA method. However, during the course of the analyses it was determined that there was a problem with the standard solutions in the field screening kit. This called into question the reliability of the results and the method was discontinued. The remaining samples that had not exceeded holding times were sent to the laboratory for analysis.

Significant concentrations of PCP and PAHs were detected in groundwater samples. The cPAHs were detected at lower concentrations. The 2004 investigation concluded that the contamination plume in shallow groundwater has been delineated, and that contamination from the shallow aquifer has reached the intermediate aquifer.

Phase 4

In December 2006, the Phase 4 investigation began. Two wells (MW09I and MW10I) were installed on-Site, one well (AFMWI-3) was installed to the east of the Site adjacent to the athletic fields, two wells (MASMWI-1 and MASMWI-2) were installed on the property located southeast of the Site, and one well (TMWI-2) was installed to the south of the Site.

Only intermediate zone wells were investigated during the 2006 groundwater sampling event. Eleven existing wells and the six newly installed wells were sampled. Samples were analyzed for PCP and total PAHs. The analytical results from the December 2006 intermediate zone groundwater sampling event confirmed previous investigation results which showed that Site-related contamination is present in the intermediate zone primarily in the immediate vicinity of the Site and former process areas. PCP was detected in several of the existing intermediate wells and in both of the newly installed on-Site intermediate wells. PCP concentrations ranged from 0.075 µg/L in MW07I (located in the northern portion of the Site near Bennett Street) to 3,500 µg/L in PMW01I (located at the intersection of Powell and Thomas Streets near the southeastern edge of the Site). Naphthalene was also detected in several of the existing intermediate wells and in one of the new on-Site intermediate wells. Naphthalene concentrations ranged from 6.4 µg/L in PMW01I to 2,200 µg/L in newly installed well MW10I (located near the eastern edge of the Site).

During the December 2006 investigation, three wells were found near the former pole barns at the southern end of the western half of the Site. The well IDs were not known at the time of discovery, so they were designated MWPBEI (for pole barn east intermediate), MWPBWI (for pole barn west intermediate) and MWPBC (for pole barn center). The center pole barn well was not given an intermediate designation because the well was the deepest of the three wells, but the water table was consistent with the shallow residuum zone wells. The center pole barn well was identified as a potential source of contamination of the intermediate zone since there is an apparent connection between both zones at this well. Prior to the end of the investigation, the three pole barn wells were sampled. Due to the apparent interconnection between the two zones at the center pole barn well, MWPBC was not purged in an attempt to prevent potential shallow contamination from being drawn down into the deeper zone. Instead, the center well was sampled from the top of the water table and from as near the bottom of the well as possible.

The results of the three pole barn wells indicated naphthalene and PCP contamination in the intermediate aquifer, in an area where delineation of the intermediate aquifer had not previously been investigated. The wells had relatively short surface casing sticking up above ground level, had no caps, and were located in an area of the Site which has been historically prone to flooding. Therefore, the three wells themselves could have been a source of contamination reaching the intermediate groundwater zone during flood events when standing water at the Site exceeded the height of the casing. In order to investigate and evaluate the possibility of the pole barn wells being occasional point sources of contamination, a small-scale chemical oxidant application was conducted at the eastern pole barn well several of the intermediate wells resampled.

In March 2008, the small-scale chemical oxidation study was performed by applying a potassium permanganate solution into the eastern pole barn well. For the study, a solution consisting of potassium permanganate and water was gravity fed directly into the eastern pole barn well. The solution consisted of just under 100 gallons of solution at a 2 percent mixture. The total quantity of potassium permanganate used was approximately 2.3 pounds.

In May 2008, the eastern pole barn well was resampled after the application of the chemical oxidant. In addition, the intermediate wells installed in December 2006 were resampled to obtain an additional data point for the newest wells. Results indicated the presence of trace concentrations of naphthalene in wells MASMW02I and TMW02I located southeast and south of the Site, respectively. High levels of naphthalene and PCP were once again found in on-Site well MW10I. Naphthalene, PCP, and total PAH concentrations increased in MW10I since the previous sampling event in December 2006. In addition, an increase in the concentration of naphthalene and PCP in the eastern pole barn well was observed post-injection of the oxidant.

In October 2008, a Site visit was conducted to re-inject an increased dosage of potassium permanganate solution into the eastern pole barn well. This dose consisted of approximately 25 pounds of potassium permanganate mixed with approximately 400 gallons of water, or approximately ten times the previous dose.

In February 2009, a full round of groundwater sampling was conducted at the Site. All existing shallow and intermediate wells at the Site were sampled with the exception of three wells. Intermediate well LMWI01 located on Lincoln Street north of the Site could not be located by the field team. Shallow wells MW05S and MW07S were not sampled due to the presence of free product. A total of 27 intermediate wells and eight shallow wells were sampled in addition to MWPBC, which is not classified as either shallow or intermediate due to the apparent interconnection.

Analytical results of shallow groundwater samples indicated a noted absence of shallow groundwater contamination in the wells located west of the drainage ditch, which separates the non-remediated eastern portion of the Site from the western portion of the Site and is currently being used by the Mitchell County Recreation Department for soccer fields and offices. Free product was encountered in MW05S located near the midpoint of the eastern edge of the Site and in MW07S located near the midpoint of the northern edge of the Site. Elevated concentrations of wood treating contaminants were found in all of the shallow wells located on the non-remediated eastern side of the Site. Figure 3 shows shallow groundwater sample locations and a summary of the analytical results.

Analytical results of the intermediate groundwater samples collected in February 2009 continue to demonstrate that there is no evidence of Site-related contamination above trace levels east of the railroad tracks east of the Site. Figure 4 shows intermediate groundwater sample locations and a summary of the analytical results. The most significant observations from the February 2009 analytical results include the following:

- A significant decrease in the concentration of PCP in PMW01I since the previous time this well was sampled in December 2006 (from 3,500 µg/L to 38 µg/L).
- A continued increase in the concentration of PCP in MWPBEI despite the addition of increasing doses of potassium permanganate.
- Concentrations of naphthalene, PCP, and total PAHs have consistently increased in MW10I.

2.3 Community Participation

The notice of the availability of the Administrative Record and an announcement of the Proposed Plan public meeting was published in the *Camilla Enterprise* newspaper on August 12, 2009. A public comment period was held from August 12 through September 10, 2009. The Proposed Plan was presented to the community during a public meeting on August 20, 2009 at the Southwest Georgia Regional Commission Building with 12 people in attendance. At this meeting, representatives from EPA and GAEPD answered questions from the community concerning the proposed remedy and the remedial alternatives evaluated for Camilla Wood.

In support of this ROD, the Proposed Plan Fact Sheet was also mailed to the community on August 10, 2009. The Administrative Record file is available to the public and is placed in the information repository maintained at the EPA Region 4 Superfund Record Center and at the De Soto Regional Library at 145 East Broad Street, Camilla, Georgia. EPA's responses to the comments received during the public comment period are included in the Responsiveness Summary, located in Part 3 of this ROD. The transcript from the public meeting can be found in the Administrative Record and as Appendix A to this Record of Decision.

2.4 Scope and Role of Response Action

As with many Superfund Sites, the problems encountered at the Camilla Wood Site are complex. During previous investigations, contamination issues presented an immediate need for treatment. Previous response actions that have been completed include the following:

- Water from a storage impoundment was pumped into a storage tank located at the wastewater treatment area.
- Waste drums were gathered and staged on-Site and the impoundment area was backfilled with on-Site soils.
- In 1992, approximately 95,000 gallons of wastewater was treated on-Site, the sludge in the impoundment was solidified, and the impoundment was capped.
- In 1994, the process area was dismantled.
- Approximately 522,000 gallons of water were treated and discharged to an on-Site evaporation pond.
- Additionally, 30,723 gallons of pentachlorophenol and creosote were removed from on-Site tanks and shipped off-Site for disposal.
- In October 1994, approximately 5,000 cubic yards (cy) of soil were removed from a Site parking lot, an easement along Bennett Street, and four residential properties across Bennett

Street based on the results of dioxin sampling, and stockpiled in a lined, bermed, on-Site staging area.

- In 1995, approximately 5,000 tons of contaminated soils were shipped off-Site for disposal.
- In 2006, a soil removal was performed for the western portion of the Site.

A comprehensive remediation strategy will focus on both soil and groundwater contamination in a single remediation plan. Active measures will be taken to remediate: 1) On-facility surface and subsurface soils and 2) Groundwater. The selected remedy will fully address the soil and groundwater contamination at the Site. This decision document presents the final remedy for the Camilla Wood Treatment (Escambia) Superfund Site. This action will reduce risks to human and ecological receptors from contaminated groundwater and soil and provide for completion of remedial action at the Site, and will be compatible with the planned future reuse of the Site.

2.5 Site Characteristics

2.5.1 Conceptual Site Model

The conceptual Site model (CSM) incorporates information on the potential chemical sources, release mechanisms, affected media, potential exposure pathways, and known receptors to identify complete exposure pathways. The CSM for the Camilla Wood Site is presented in Figure 5. The primary release mechanism was spills/leaks and leaching from wood treating operations to the surface and subsurface surrounding the facility. Secondary release mechanisms include surface runoff and infiltration. Percolation of rainwater through contaminant source areas and other contaminated subsurface soils may result in contaminants leaching into groundwater.

A summary of the conceptual model is presented below:

- Releases from impoundments, spills, a waste water treatment area, chemical storage area, and contaminated storm water runoff impacted surface and subsurface soil;
- Contaminants leached from soils into groundwater;
- Karst features are present at the Site and the presence of Site-related contamination in the intermediate groundwater zone is believed to be at least partially attributable to the presence of karst at the Site.

2.5.2 Site Overview

The Camilla Wood Site is located in southeast Camilla, Mitchell County, Georgia. Camilla is the county seat for Mitchell County. The Site is located south and east of residential neighborhoods which borders the Site along the north and northwest borders. The residential neighborhoods toward the west of the Site are separated by an area of forested lands (mainly pines) which act as a buffer between the Site's western border and the residential neighborhood. Thomas Street borders the Site along its eastern edge. A small football stadium, a Department of Transportation equipment area and several businesses including, what appears to be sawmills, are located along Thomas Street. The southern portion of the property is bordered by a City of Camilla water tower, a storm water retention basin and forested lands.

The Site operated as a wood treating facility from 1947 to 1991. The facility is located in a mixed industrial and residential area of the City of Camilla, Mitchell County, Georgia. Facility operations resulted in extensive creosote and PCP contamination in soil and groundwater. Soil at the Site also is contaminated with dioxin, which is a common impurity in commercial-grade PCP.

2.5.3 Geology

The Camilla Wood Site is situated on a wedge of coastal plain clastic and carbonate sediments ranging in age from Cretaceous to recent. The sediments represent both nonmarine and marine sources and consist of alternating units of sand, clay, sandstone, dolomite, and limestone that dip gently and thicken regionally to the southeast to a depth of over 5000 feet (Hicks et al, 1987; Hayes et al, 1983). The formations underlying the Site are, in descending order, an undifferentiated residuum, the Ocala Limestone, and the Lisbon Formation. The regional dip is toward the southeast.

The most recently deposited geologic unit occurring in the area is the undifferentiated residuum, which Owen (1963) states is probably a mixture of residues of the Ocala, Suwannee, and Tampa Limestones, the Hawthorn Formation, and Pleistocene terrace material (Figure 6). Although Owen (1963) indicates that the residum extends to a depth of approximately 50 feet near the Site, the boring for MW06I indicates a depth to the bottom of the residuum at 150 feet below the Camilla Wood Site. This variance in depth to the bottom of the residuum was observed again during the installation of MASMWI1, the lithology at this location indicates a depth of 115 feet to the bottom of the residuum at a property adjacent to the Camilla Wood Site. The wide variance in depth to the bottom of the residuum could be indicative of subsidence occurring locally. The residuum is described in the well log from a city well in Camilla (located 0.5 miles west of the Site) as being composed of pinkish gray, yellowish orange to yellowish brown, varying thicknesses of interbedded silts, clays, quartz sand, and gravel, with iron oxide stains occurring with depth. This description is very similar to the lithology described in the 1999 RI Report (EPA, 1999) and observed during the 2006 field event.

The undifferentiated residuum is underlain by an Upper Eocene carbonate unit called the Ocala Limestone. The Ocala Limestone is part of the Jackson Group. Near the Site, at the city well in Camilla, the thickness of the Ocala Limestone was 290 feet. The city well log described the Ocala Limestone as very pale orange to almost white, porous, bioclastic with Foraminifera, shells and Bryozoa fragments cemented in a matrix of fine-grained material with iron oxide pellets occurring in the first ten feet (Owen, 1963). The first carbonate unit encountered during the activities has been described as cream to buff with some tan and red tinted intervals, weathered, fossiliferous, with nodules surrounded with a matrix of unconsolidated shell hash and carbonate sand. The RI Report documents some void spaces exceeding three feet in thickness, within the carbonate unit and a zone of pressurized air was encountered at the contact between the overlying clays and the carbonate unit (EPA, 1999).

Underlying the Ocala Limestone is the middle-Eocene Lisbon formation. The Lisbon formation is part of the Claiborne Group. The Lisbon formation was encountered at the city well at a depth of 341 feet. The top of the Lisbon formation is described as being pale yellowish brown, fine to coarsely crystalline, glaconitic, and fossils are rare. The Lisbon formation transitions into a yellowish gray to very pale orange, fine grained, subrounded, clear quartz, glauconitic, and abundant limestone fragments.

2.5.4 Hydrogeology

The uppermost hydrostratigraphic unit at the Site is the undifferentiated residuum. Although small quantities of groundwater can be obtained from the residuum, it is described as a poor aquifer and serves mainly as a confining bed. The water table is between one and five feet bls. The undifferentiated residuum has estimated median vertical and horizontal hydraulic conductivity values of 0.003 feet per day (ft/day) and 0.02 ft/day, respectively.

Figure 7 depicts the potentiometric surface and apparent groundwater flow direction in the residuum in 1997, 1998, 2002, and 2008. The direction of groundwater movement in the residuum is primarily toward the west in the eastern portion of the Site. The direction of groundwater flow in the western portion of the Site has been observed to change from year to year. This change in direction could be influenced by the variations in the amount and location of precipitation, and is assumed to be a direct result of the flat topography. There are no known extraction wells screened in the residuum within the immediate vicinity of the Site.

The Ocala Limestone is the major water producing aquifer for the area and forms the upper Floridan aquifer system at the Site. All of the City of Camilla municipal supply wells withdraw water from the Ocala Limestone. Site-specific hydraulic conductivity values ranged from 0.9 ft/day to 72.4 ft/day. The direction of groundwater movement in the upper Floridan aquifer is toward the southwest (Figure 8). The Ocala Limestone in combination with Tampa and Suwannee limestones (all make up the Jackson Group) will yield 500 to 4,000 gallon per minute (gpm) in the local vicinity (Thomson et al., 1956).

2.5.5 Nature and Extent of Contamination

Groundwater samples were collected during all four phases of the remedial investigation. During the phase I sampling investigation, samples were collected from existing monitoring wells to characterize the dispersion and contaminant concentrations found in groundwater originating from wood treatment processes. After the analytical results were evaluated, more groundwater samples were collected during phase II, phase III, and phase IV sampling investigations to further characterize the extent of groundwater contamination.

During phase II, phase III, and phase IV groundwater investigation, additional permanent and temporary wells were installed and sampled. Moreover, DPT was used to collect groundwater samples at several locations. The following sections describe the findings of the phases.

2.5.5.1 Groundwater Investigation

Each of the successive groundwater investigation events was designed to supplement our knowledge of the nature and extent of groundwater contamination at the Site. Wells were positioned based on data obtained at each phase and our understanding of the hydrogeological system at the Site. The primary goal was to be able to delineate the extent of pollutants in plan view at the Site.

Two different zones were sampled: a shallow zone (screened intervals ranging from approximately 15–25 feet bgs), and an intermediate zone targeted just below the top of the Ocala Limestone (screened intervals ranging from 60-70 feet bgs to 160–170 feet bgs). The extent of groundwater contamination is depicted using naphthalene, a major constituent in creosote and PCP since creosote and PCP were used for different durations and occupied different process areas of the Site. Naphthalene's relatively high solubility makes it among the most mobile of the creosote constituents in groundwater and thus a useful tool to measure the extent of groundwater contamination attributable to a creosote source.

Shallow Zone. Figures 9 and 10 depict the extent of the naphthalene and PCP plumes in the shallow zone, respectively. The shallow groundwater zone is characterized by very flat hydraulic gradients which have been observed to change direction, presumably influenced by variations in the amounts and locations of rainfall (Figure 7). Contaminant migration in the shallow groundwater zone appears to be very slow both horizontally and vertically due to the very flat gradients and low permeability soils in the shallow zone. In general, contamination is greatest on the eastern side of the Site where wood treating chemicals were stored and used and along the northern portion of the Site where the drip track was located.

NAPL exists near the source(s) of contamination. Free product was observed in MW05S and MW07S during the February 2009 sampling event. As may be seen in Figure 2, the area encompassing the NAPL observations was the central processing area when the facility was active.

In addition to the creosote components (PAHs), other contaminants exist in the eastern plume as well. Noteworthy among them are PCP, arsenic, and manganese. Generally speaking, the highest concentrations of PAHs did not directly correlate to the highest concentrations of PCP. The highest PCP concentration detected in the shallow groundwater zone was 400 µg/L, in MW04S, located in the southeastern corner of the Site, an area which contained some of the lower PAH concentrations. MW04S is in an area which has historically contained elevated PCP concentrations, and the PCP concentration trend over time at this location has consistently decreased. The PCP concentrations have ranged from 3,000 µg/L in April 1998, to 600 µg/L in February 2003, to 300 µg/L in February 2009. The lack of adjacent shallow monitoring wells in locations which may be downgradient of MW04S make it difficult to state with certainty the cause of the decreasing concentration trend since there are several possibilities which can't be eliminated based on the available data. The potentially viable explanations for the decreasing PCP concentration trend at the southeast corner of the Camilla Wood Site include:

- The PCP contamination in the shallow groundwater zone in the southeastern corner of the Site is undergoing natural degradation processes. During the most recent sampling event in February 2009, the dissolved oxygen concentration observed during the purging of the monitoring well ranged from an initial value of 1.00 mg/L at the beginning of the purge, gradually stabilizing to 0.26 mg/L. The oxidation/reduction potential was within the range of

– 57 mV to -72 mV for the duration of the purge. These readings suggest an anaerobic environment.

- Shallow PCP contaminated groundwater in the southeast corner of the Site could potentially be discharging to the drainage ditch at the southern border of the Site or could be migrating horizontally downgradient.
- Due to the observed changes in the direction of groundwater flow in the shallow zone over time, the PCP plume in the southeastern corner of the Site could be subject to mixing and dilution effects.
- Due to the presence of karst in the general Site area, the southeastern portion of the Site could be situated near a karst feature where vertical migration could be occurring into the intermediate groundwater zone.

It is also noteworthy that elevated concentrations of Site COCs were not detected on the western portion of the Site where the soil removal action was completed in 2006 (based on the data from the 2 remaining permanent shallow monitoring wells as can be seen on Figure 3).

Intermediate Zone. Figures 11 and 12 illustrate the extent of the naphthalene and PCP plumes, respectively, in the intermediate zone. RI results indicate that Site related contaminants have migrated into the intermediate groundwater zone at the Site. PCP is fairly widespread in the intermediate wells at the Site, but is limited to the area west of the railroad tracks to the east of the Site. Naphthalene contamination at concentrations of concern appears to be isolated to two plumes (one practically bisecting the eastern portion of the Site in an east-west direction and one in the former pole barn area on the western side of the Site) and one smaller hot spot at the northwest corner of the Site.

The highest concentrations of Site related contaminants were found in MW10I located near the eastern edge of the Site, and concentrations have increased consistently in this well over three sampling events since December 2006. These observations suggest that MW10I may likely be near a primary source of migration of contamination from the shallow groundwater zone to the intermediate groundwater zone. In addition, PCP concentrations have consistently increased in the eastern pole barn well despite the addition of permanganate in the well, suggesting that there may be a more widespread PCP plume in the vicinity of the well. This observation is surprising since there is no known source of PCP operations in that area of the Site and because there does not appear to be a continuous plume between the source area to the northeast and the former pole barn area. Possible explanations for the observed increase in PCP concentrations over time in this well include: (1) the possibility that there was some kind of disposal or discharge which led to the contamination in that area; (2) there could have been a period during which there may have been some PCP usage in that area; or (3) there could be a karst-influenced conduit between the source area and the former pole barn area rather than a more defined plume.

2.5.5.2 Surface Soil

One hundred forty-two surface soil samples were collected from 134 locations during the 1998 and 1999 RI. The December 1999 RI Report prepared by the USEPA Science and Ecosystem Support Division (SESD) provides details of the investigation activities and results. Soil samples which were collected from the western portion of the Site within the area of the 2006 removal action (66 grid locations) are not considered part of the data set being evaluated. Only the results of the samples from the remaining 68 grid locations are summarized and discussed below. Surface soil samples collected from the grid locations were collected from 0 to 0.25 ft bls and were collected as 5-point composite samples.

BaP Toxicity Equivalents. Carcinogenic PAHs were detected in surface soil samples from 61 of the 68 grids located outside the area which was addressed by the 2006 soil removal action. BaP concentrations ranged from trace levels to 16,652 micrograms per kilogram (µg/kg). Of the locations where carcinogenic PAHs were detected, 36 contained BaP equivalent concentrations greater than 1,000 µg/kg, with the highest concentrations observed in the former chemical area, located across Powell Street, east of the Site. Figure 13 shows the distribution of BaP concentrations in the surface soil samples collected at the Site. As can be seen in Figure 13, elevated concentrations of carcinogenic PAHs were found in the three grids located south of the Site and adjacent to the Department of Transportation facility

Pentachlorophenol. PCP was detected in 53 of the 68 sampling grids not addressed by the removal action, with 23 of the sample results exceeding the 3,000 µg/kg Regional Screening Level (RSL) for residential soil. Concentrations greater than 10,000 µg/kg were observed in 11 of the grid locations. The highest concentration of PCP (130,000 µg/kg) was detected in the former chemical area across Powell Street east of the Site in grid 195. Figure 14 shows the locations of the highest detected concentrations of PCP in surface soils at the Site.

Dioxin. Dioxin TEQ was detected in each of the 19 grids in which it was analyzed. Concentrations ranged from 12 to 11,000 nanograms per kilogram (ng/kg) (i.e. parts per trillion, ppt). For comparison, EPA's current dioxin soil cleanup level for typical direct contact residential exposure is 1,000 ng/kg. This cleanup level is derived from EPA's April 13, 1998, Office of Solid Waste and Emergency Response (OSWER) Directive titled <u>Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites [9200.4-26 (EPA, 1998a)]</u>. In this directive, EPA states that 1 µg/kg (1,000 ng/kg) TEQ is to be generally used as a starting point for setting cleanup levels for the CERCLA removal Sites and as a preliminary remedial goal (PRG) for remedial Sites for dioxin in surface soil involving a residential exposure scenario. For commercial/industrial exposure scenarios, a soil level within the range of 5 µg/kg (5,000 ng/kg) to 20 µg/kg (20,000 ng/kg) TEQ should generally be used as a starting point for setting cleanup levels at CERCLA removal Sites. The 1998 directive serves as an interim policy pending the release of EPA's dioxin reassessment. Six of the 19 locations analyzed for dioxins contained dioxin TEQ concentrations greater than 1 µg/kg. Figure 15 shows the relative distribution of dioxin contamination in the surface soils at the Site.

2.5.5.3 Subsurface Soil

One hundred eighty-six samples were collected from 134 grid locations during the 1998 and 1999 RI. Soil samples which were collected from the western portion of the Site within the area of the 2006 removal action (66 grid locations) are not considered part of the data set being evaluated. Only the results of the samples from the remaining 68 grid locations are summarized and discussed below.

BaP Toxicity Equivalents. Carcinogenic PAHs were detected in 41 of the 68 grids which were not addressed by the 2006 soil removal action. BaP concentrations ranged from trace levels to 125,270 µg/kg. The highest concentrations were observed in the area of the former cooling ponds, in the northeast portion of the Site. BaP equivalent concentrations exceeding 1,000 µg/kg were detected in 18 grid locations. Concentrations of carcinogenic PAHs were generally observed to be greater in the subsurface soil samples than in the surface soil samples. Figure 16 shows the distribution of BaP concentrations in subsurface soil at the Site. As was the case for surface soil, elevated concentrations of carcinogenic PAHs were found in off-Site samples, including 3 grids located south of the Site on the property adjacent to the Department of Transportation facility and one grid in the storm water detention basin south of the western portion of the Site.

Pentachlorophenol. PCP was detected in 30 of 68 grids at concentrations ranging from 42 µg/kg to 230,000 µg/kg, with the highest concentrations being observed in the northern portion of the Site, in the vicinity of the former cooling ponds. PCP concentrations were generally higher in the subsurface soil samples than in the surface soil samples. Figure 17 shows the distribution of PCP contamination in the subsurface soil at the Site. One Off-Site grid (grid 104) contained elevated PCP at a concentration of 14,000 µg/kg. This sample was collected from the storm water detention basin south of the western portion of the Site.

Dioxin. Subsurface soil samples were not analyzed for dioxin.

2.5.5.4 Surface Water Sampling

Ten surface water samples were collected during the 1998 and 1999 RI and are summarized in the December 1999 RI Report (EPA, 1999). The 2006 soil removal action also addressed the sediment in the drainage ditches on and adjacent to the Site. As part of the Baseline Ecological Risk Assessment (BERA), Black & Veatch Special Projects Corporation (Black & Veatch) collected five surface water samples from the drainage ditches adjacent to the Site in August 2008. No Site contaminants were detected in any of the post-removal surface water samples.

BaP Toxicity Equivalents. No BaP TEQs were detected in any of the surface water samples.

Pentachlorophenol. PCP was not detected in any of the surface water samples.

Dioxin. Dioxin was not analyzed for in the surface water samples.

2.5.5.5 Sediment Sampling

Ten sediment samples were collected during the 1998 and 1999 RI and are summarized in the December 1999 RI Report (EPA, 1999). The 2006 removal action addressed sediments in the ditches at the Site. In August 2008, Black & Veatch collected five sediment samples from the ditches adjacent to the Site.

BaP Toxicity Equivalents. Carcinogenic PAHs were detected at low concentrations in all five of the sediment samples collected in August 2008; however, no compounds exceeded any screening values.

Pentachlorophenol. PCP was detected at low concentrations in all five sediment samples collected in August 2008; however, PCP concentrations did not exceed the screening values in any of the samples.

Dioxin. Dioxin was detected at low concentrations in all of the sediment samples collected in August 2008. TEQ values ranged from 0.087 µg/kg to 0.31 µg/kg, all of which exceeded the EPA Region 4 Sediment Screening Value of 0.0025 µg/kg.

2.6 Current and Future Land Use

2.6.1 Current Land Use

The Camilla Wood Site is located in southeast Camilla, Georgia. Camilla is the county seat for Mitchell County. In 1994, the City of Camilla had a population of 5,041 residents, making it the 94th largest city in the State of Georgia (Georgia County Guide, 1996). The Site is located south and east of residential neighborhoods which borders the Site along the north and northwest borders. The residential neighborhoods toward the west of the Site are separated by an area of forested lands (mainly pines) which act as a buffer between the Site's western border and the residential neighborhood. The nearest residences to the Site are the homes located along Bennett Street, approximately 75 feet north of the Site boundary. According to the 1994 Expanded Site Investigation, there are approximately 1,250 residents within ¼-mile, 2,829 residents within ½-mile and 5,211 residents within one mile from the Site.

Thomas Street borders the former facility along its eastern edge. A small football stadium, a Department of Transportation equipment area, and several businesses, including, what appears to be sawmill are located along Thomas Street. The southern portion of the property is bordered by a City of Camilla water tower, a storm water retention basin, and forested lands.

The Ocala Limestone is the major water producing aquifer for the area and forms the upper Floridan aquifer system at the Site. All of the City of Camilla municipal supply wells withdraw water from the Ocala Limestone. The Ocala Limestone in combination with Tampa and Suwannee limestones (all make up the Jackson Group) will yield 500 to 4,000 gallon per minute (gpm) in the local vicinity (Thomson et al., 1956).

The western portion of the Site has undergone a soil removal action, and this portion of the Site has been returned to beneficial use. In addition to the soil removal action, the drainage ditch bordering the former facility has been improved including the relocation of several species which previously inhabited the ditches, removal of contaminated sediments, and general ditch cross-section improvements to enhance open channel flow. Following the soil removal action, the western portion of the Site was transitioned into soccer fields and is currently being used by the Mitchell County Recreation Department. The Site office building, located on East Bennett Street, is the only historical building remaining, and it now houses the Mitchell County Recreation Department employees.

2.6.2 Future Land Use

The chosen remedial alternative is developed based on the assumption that the future site use will remain recreational. A recreational cleanup level is also protective for industrial and commercial uses.
As part of the institutional controls that will be used to control Site use, a restrictive covenant, deed restrictions, local groundwater ordinances , regulatory prohibitions against groundwater use and/or other institutional controls may be placed on the Site property to require that future land use will not become residential unless it can be demonstrated to EPA's satisfaction that such an alternative use is protective of human health and the environment for a particular portion of the Site.

The Mitchell County Recreation Department plans on expanding the sports complex, following the remedial action on the eastern half of the Site.

2.7 Summary of Site Risks

The baseline risk assessment (BRA) estimates what risks the Site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the BRA which includes an evaluation of the human health and ecological receptors.

2.7.1 Summary of Human Health Risk Assessment (HHRA)

2.7.1.1 Identification of Chemicals of Concern

Carcinogenic and non-carcinogenic chemicals of concern (COCs) were identified for the media evaluated at the Camilla Wood Site. Non-carcinogenic COCs were identified as those chemicals of potential concern (COPCs) that contribute a hazard quotient (HQ) of 0.1 or greater to any pathway evaluated. Cumulative Site cancer risks that exceeded 1 x 10^{-4} are considered COCs.

The soil was segregated into nine exposure units which include the Hiking Path, Wooded Area West of the Site, Wooded Area West of the Site Hot Spot, Drainage Pond/Ditch, Partially Wooded Area, Car Repair Shop, Former Pressure Vessel Area, Main Operations, and Commercial/Residential Area. The groundwater was separated into the shallow and intermediate aquifers.

For the purposes of this risk assessment summary, the presentation is limited to the receptors and media of concern which includes the child and adult recreational users, construction/excavation worker, and child and adult residents. These media and the exposure routes associated with them result in the greatest potential risk. The data summary for surface soil in the Partially Wooded Area, Main Operations Area, Commercial/Residential Area, Former Pressure Vessel, and Car Repair Shop may be found in Table 1. The data summary for subsurface soil in the Partially Wooded Area, Main Operations Area, and Former Pressure Vessel Area may be found in Table 2. The data summary for the shallow and intermediate groundwater may be found in Table 3.

2.7.1.2 Exposure Assessment

An exposure assessment identifies pathways whereby receptors may be exposed to Site contaminants and estimates the frequency, duration, and magnitude of such exposures. Exposure assessment involves (1) characterization of the environmental setting, (2) identification of exposure pathways, and (3) quantification of exposure. The environmental setting is discussed in Section 2. The two remaining elements of an exposure assessment are discussed below.

Exposure pathways were determined in a conceptual Site model that incorporates information on the potential chemical sources, release mechanisms, affected media, potential exposure pathways, and known receptors to identify complete exposure pathways. A pathway is considered complete if (1) there is a source or chemical release from a source; (2) there is an exposure point where contact can occur; and (3) there is a route of exposure (oral, dermal, or inhalation) through which the chemical may be taken into the body.

The conceptual Site model for the Camilla Wood Site is presented on Figure 5. The primary release mechanisms were spills and leaks from wood treating operations to the surface and subsurface soil. Secondary release mechanisms include surface runoff and infiltration. Percolation of rainwater through contaminant source areas and other contaminated subsurface soils may result in contaminants leaching into groundwater.

Based on the understanding of the fate and transport of contaminants and the potential for human contact, the following scenarios, exposure pathways, and exposure routes were quantitatively evaluated:

- Future On-Site/Off-Site Recreational Users. Child and adult recreational users may participate in recreational activities at the Site. Potential routes of exposure for the On-Site child and adult recreational users include ingestion, inhalation, and dermal contact with COCs in surface soil.
- Future On-Site Construction/Excavation Worker. Future construction/excavation workers may be exposed to COCs in soil while working at the Site. Potential exposure routes for the construction/excavation worker include incidental ingestion of, dermal contact with, and inhalation of particulate emissions from surface and subsurface soil. Future construction/excavation workers may also be exposed to COCs in groundwater via ingestion.
- Future On-Site Resident. Residents may be exposed to the COCs in groundwater and surface soil if the land use allowed for residential development at the Site. Potential routes of exposure for the On-Site child and adult residents include ingestion, inhalation, and dermal contact with groundwater while showering; ingestion and dermal contact with COCs in surface soil.

The vapor intrusion pathway was evaluated for all scenarios. Vapor intrusion is the migration of volatile chemicals from the subsurface into overlying buildings. Volatile chemicals in buried wastes and/or contaminated groundwater can emit vapors that may migrate through subsurface soils and into indoor air spaces of overlying buildings. Current/future indoor air concentrations (resulting from subsurface vapor intrusion into buildings) were developed using the Johnson and

Ettinger Model. Vapor intrusion was found to not constitute a threat to human health at the Site and in nearby off-site residences due to the low volatility of contaminant concentrations in surficial groundwater.

Exposure Point Concentrations (EPCs) were calculated in accordance with EPA Region 4 policies. Human intakes were calculated for each chemical and receptor using the EPCs. For noncarcinogens, intake was averaged over the duration of exposure and is referred to as the average daily dose (ADD). For carcinogens, intake was averaged over the average lifespan of a person (70 years) and is referred to as the lifetime average daily dose (LADD). ADDs and LADDs were calculated using standard assumptions in accordance with EPA Risk Assessment Guidance (EPA, 1989). The exposure models and assumptions are presented in Tables 4.1 through 4.16 in Appendix A of the Baseline Risk Assessment.

The risks and hazards relevant to the action proposed in this ROD are presented for the future recreational users, future On-Site construction/excavation worker and future residents. These receptors represent the greatest potential risk and justify implementation of the Selected Remedy. The risks and hazards associated with the other current and future receptors/media combinations may be found in the Baseline Risk Assessment.

2.7.1.3 Toxicity Assessment

Toxicity assessment is a two step process whereby the potential hazards associated with route specific exposure to a given chemical are: (1) identified by reviewing relevant human and animal studies, and (2) quantified through analysis of dose response relationships.

EPA toxicity assessments and the resultant toxicity values were used in the baseline evaluation to determine both carcinogenic and noncarcinogenic risks associated with each COC and route of exposure. EPA toxicity values that were used in this assessment include:

- Reference dose (RfDs) values for noncarcinogenic effects.
- Cancer slope factors (CSFs) for carcinogenic effects.

The RfDs and CSFs used in this assessment were primarily obtained from EPA's Integrated Risk Information System (IRIS) database. Values that appear in IRIS have been extensively reviewed by EPA work groups and thus represent Agency consensus. If no values for a given compound and route of exposure were listed in IRIS, then EPA's Provisional Peer-Reviewed Toxicity Values (PPRTVs) were consulted. Where no value was listed in IRIS or PPRTV, other peer-reviewed values were used, such as Minimal Risk Levels (MRLs) and Health Effects Assessment Summary Tables (HEAST).

Tables 4 and 5 of this ROD summarize the toxicity values for carcinogenic COCs and Tables 6 and 7 summarize the toxicity values for noncarcinogenic COCs. Toxicological profiles of the COCs may be found in Appendix E of the Baseline Risk Assessment.

2.7.1.4 Risk Characterization

The final step of the Baseline Human Health Risk Assessment (BHHRA) is the risk characterization. Human intakes for each exposure pathway are integrated with EPA reference toxicity values to characterize risk. Carcinogenic and noncarcinogenic effects are estimated separately.

To characterize the overall potential for noncarcinogenic effects associated with exposure to multiple chemicals, the EPA uses a hazard index (HI) approach. This approach assumes that simultaneous sub-threshold chronic exposures to multiple chemicals that affect the same target organ are additive and could result in an adverse health effect. The HI is calculated as follows:

$$HI = ADD1 /RfD1 + ADD2 /RfD2 + ADDi /RfDi$$

where:
ADDi = Average Daily Dose for the ith toxicant
RfDi = Reference Dose for the ith toxicant

The term ADDi/RfDi is referred to as the hazard quotient (HQ).

Calculation of an HI in excess of unity indicates the potential for adverse health effects. Indices greater than one will be generated anytime intake for any of the COCs exceeds its RfD. However, given a sufficient number of chemicals under consideration, it is also possible to generate an HI greater than one even if none of the individual chemical intakes exceeds its respective RfD.

Carcinogenic risk is expressed as a probability of developing cancer as a result of lifetime exposure. For a given chemical and route of exposure, excess lifetime cancer risk is calculated as follows:

$$Risk = LADD \times CSF$$

where:

LADD = Lifetime Average Daily Dose
CSF = Cancer Slope Factor

These risks are probabilities that are generally expressed in scientific notation (e.g., 1×10^{-6} or 1E-6). An incremental lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of Site related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site. For exposures to multiple carcinogens, the EPA assumes that the risk associated with multiple exposures is equivalent to the sum of their individual risks.

2.7.1.4.1 Summary of Cancer Risks Associated with the Future Child Recreational User.

The cancer risk for the future Off-Site child recreational user in the Partially Wooded Area is 4 x 10^{-5}. The cancer risk for the future On-Site child recreational user in the Car Repair Shop Area is 4 x 10^{-4}. The cancer risk for the future On-Site child recreational user in the Former Pressure Vessel Area is 8 x 10^{-5}. The cancer risk for the future On-Site child recreational user in the Main Operations Area is 1 x 10^{-5}. The cancer risk for the future On-Site child recreational user in the Commercial/Residential Area is 9 x 10^{-4}. The total cancer risk for the future child recreational user across all areas is 1 x 10^{-3}. The risk characterization summary is included in Table 8.

2.7.1.4.2 Summary of Cancer Risks Associated with the Future Adult Recreational User.

The cancer risk for the future Off-Site adult recreational user in the Partially Wooded Area is 5 x 10^{-5}. The cancer risk for the future On-Site adult recreational user in the Car Repair Shop Area is 6 x 10^{-4}. The cancer risk for the future On-Site adult recreational user in the Former Pressure Vessel Area is 1 x 10^{-4}. The cancer risk for the future On-Site adult recreational user in the Main Operations Area is 2 x 10^{-5}. The cancer risk for the future On-Site adult recreational user in the Commercial/Residential Area is 9 x 10^{-4}. The total cancer risk for the future adult recreational user across all areas is 2 x 10^{-3}. The risk characterization summary is included in Table 9.

2.7.1.4.3 Summary of Cancer Risks Associated with the Future Construction/Excavation Worker.

The cancer risk for the future Off-Site construction/excavation worker in the Partially Wooded Area is 1 x 10^{-6}. The cancer risk for the future On-Site construction/excavation worker in the Former Pressure Vessel Area is 3 x 10^{-5}. The cancer risk for the future On-Site construction/excavation worker in the Main Operations Area is 3 x 10^{-5}. The total cancer risk for the future construction/excavation worker across all areas is 6 x 10^{-5}. The risk characterization summary is included in Table 10.

2.7.1.4.4 Summary of Cancer Risks Associated with the Future Child Resident.

The cancer risk for the future child resident exposure to shallow groundwater is 2 x 10^{-4}. The cancer risk for the future child resident exposure to intermediate groundwater is 4 x 10^{-4}. The total cancer risk for the future child resident exposed to all groundwater is 6 x 10^{-4}. The risk characterization summary is included in Table 11.

2.7.1.4.5 Summary of Cancer Risks Associated with the Future Adult Resident.

The cancer risk for the future adult resident exposure to shallow groundwater is 4 x 10^{-4}. The cancer risk for the future adult resident exposure to intermediate groundwater is 7 x 10^{-4}. The total cancer risk for the future adult resident exposed to all groundwater is 1 x 10^{-3}. The risk characterization summary is included in Table 12.

2.7.1.4.6 Summary of Noncancer Hazards Associated with the Future Child Recreational User.

The noncancer hazard for the future On-Site child recreational user in the Commercial/Residential Area is 7. The risk characterization summary is included in Table 13.

2.7.1.4.7 Summary of Noncancer Hazards Associated with the Future Adult Recreational User.

The noncancer hazard for the future On-Site child recreational user in the Commercial/Residential Area is 2. The risk characterization summary is included in Table 14.

2.7.1.4.8 Summary of Noncancer Hazards Associated with the Future Construction / Excavation Worker.

The noncancer hazard for the future on-Site construction/excavation worker in the Commercial/Residential Area is 1.2. The risk characterization summary is included in Table 15.

2.7.1.4.9 Summary of Noncancer Hazards Associated with the Future Child Resident.

The noncancer hazard for the future child resident exposure to shallow groundwater is 8. The noncancer hazard for the future child resident exposure to intermediate groundwater is 43. The total noncancer hazard for the future child resident exposed to all groundwater is 52. The risk characterization summary is included in Table 16.

2.7.1.4.10 Summary of Noncancer Hazards Associated with the Future Adult Resident.

The noncancer hazard for the future adult resident exposure to shallow groundwater is 7. The noncancer hazard for the future adult resident exposure to intermediate groundwater is 18. The total noncancer hazard for the future adult resident exposed to all groundwater is 25. The risk characterization summary is included in Table 17.

2.7.1.5 Cleanup Levels.

As described in the BHHRA, to develop the human health cleanup levels at the Site, EPA first identified the COPCs, which are the chemicals whose data are of sufficient quality for use in the quantitative risk assessment, are potentially Site-related, are above background concentrations at the Site, and represent the most significant contaminants in terms of potential toxicity to humans.

A list of COCs was then derived from the COPCs identified for the Site. The BHHRA assessed the total cancer and non cancer risks for each COPC for all human health pathways for each type of human receptor (i.e., receptors with separate exposure pathways).

EPA considers individual excess cancer risks in the range of $1X10^{-6}$ to $1X10^{-4}$ as protective; however, the $1X10^{-6}$ risk level is generally used as the point of departure for setting cleanup levels at Superfund sites. The point of departure risk level of $1X10^{-6}$ expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range.

The purpose of this response action is to control risks posed by direct contact with soil and groundwater, and to minimize migration of contaminants from soils to groundwater. The results of the baseline risk assessment indicate that existing site conditions pose an excess lifetime cancer risk to a future lifetime recreational user (child and adult) of $3X10^{-3}$, from direct contact with contaminated soils. The risk from site soils is primarily due to carcinogenic PAHs and pentachlorophenol. The selected remedy shall address surface soils contaminated with pentachlorophenol in excess of 46,378 micrograms per kilogram (ug/kg) and carcinogenic PAHs in excess of 1,310 ug/kg, as measured in human health toxicity equivalents to benzo(a)pyrene, which is the most toxic of the carcinogenic PAHs. The selected remedy will reduce the excess lifetime cancer risk to a future recreational user to $1X10^{-5}$, from exposure to site soils. Groundwater outside the slurry walls will be remediated until all drinking water standards have been attained. Upon consideration of current site usage and the presence of multiple contaminants, EPA determined that the acceptable target carcinogenic risk at this Site is $1x10^{-5}$ risk, and acceptable target non-carcinogenic risk at an HI of 1.

Upon consideration of the multiple contaminants at the Site in different media and EPA's experience which demonstrates the difficulty in remediating these multiple contaminants in a cleanup to an excess cancer risk of $1X10^{-6}$, EPA determined that the acceptable target carcinogenic risk at this Site is $1x10^{-5}$ risk, and acceptable target non-carcinogenic risk at an HI of 1.

The BHHRA then calculated cleanup levels for each COC by combining the intake levels of each COC from all appropriate exposure routes for a particular medium and rearranging the risk equations to solve for the concentration term (i.e., the cleanup levels). Cleanup levels are chemical concentrations which provide remedial design (RD) staff with long-term targets to use during analysis and selection of remedial alternatives. Ideally, such goals, if achieved, will comply with applicable or relevant and appropriate requirements (ARARs) and result in residual risks that fully satisfy NCP requirements for the protection of human health and the environment. Risk-based cleanup levels are guidelines and do not establish that cleanup to meet these goals is warranted. Risk-based cleanup levels were calculated for both cancer and non-cancer effects for the surface soil, subsurface soil, and groundwater at the Site.

The cleanup levels for the Site were developed specifically to protect human health and to address the risk identified in the BHHRA. These goals are based on available information, standards such as ARARs and the risk-based levels (Remedial Goal Options) established in the BHHRA. Cleanup levels at the Site were developed by using the more stringent of the COC concentrations which indicate a $1x10^{-5}$ cancer risk or a non-cancer HI of one in soil and groundwater at the Site.

The cleanup levels for soil and groundwater were selected after evaluating potential risks from COPCs in the HHRA, further refining them to meet $1 X 10^{-5}$ cancer risk, and a hazard index of 1 for noncarcinogens, and evaluating soil contaminants to ensure protection of groundwater. These cleanup levels along with the basis for their selection are found in Table 18, 19, and 20.

2.7.1.6 Uncertainties

The uncertainty analysis provides decision makers with a summary of those factors that significantly influence risk results and discusses the underlying assumptions that most significantly influence risk. This section discusses the assumptions that may contribute to over- or underestimates of risk.

2.7.1.6.1 Uncertainties Related to Environmental Sampling and Analysis.

Uncertainty is always involved in the estimation of chemical concentrations. Uncertainty with respect to data evaluation can arise from many sources, such as the quality and quantity of the data used to characterize the Site, the process used to select data to use in the risk assessment, and the statistical treatment of data. Errors in the analytical data may stem from errors inherent in sampling and/or laboratory procedures. One of the most effective methods of minimizing procedural or systematic error is to subject the data to a strict quality control review. This quality control review procedure helps to eliminate many laboratory errors. However, even with all data vigorously validated, it must be realized that error is inherent in all laboratory procedures.

2.7.1.6.2 Uncertainties Related to Exposure Assessment.

The exposure scenarios contribute a considerable degree of uncertainty to the risk assessment because they conservatively assume conditions that are unlikely to occur. The exposure assumptions directly influence the calculated doses (daily intakes), and ultimately the risk calculations. For the most part, Site-specific data were not available for this BHHRA; therefore, conservative default exposure assumptions were used in calculating exposure doses such as the selection of exposure routes and exposure factors (e.g., contact rate). In most cases, this uncertainty overestimates the most probable realistic exposures and, therefore, may overestimate risk. This is appropriate when performing risk assessments of this type so that the risk managers can be reasonably assured that the public risks may not be underestimated, and so that risk assessments for different locations and scenarios can be compared.

In order to estimate a receptor's potential exposure at a Site, it is necessary to determine the geographical location where the receptor is assumed to be exposed. Once the area of interest has been defined, the appropriate data can be selected and the exposure point concentration can be calculated. The primary source of uncertainty associated with estimating exposure point concentrations involves the statistical methods used to estimate these concentrations and the assumptions inherent in these statistical methods. Generally, an upper bound estimate of the mean concentration is used to represent the exposure point concentration instead of the measured mean concentration. This is done to account for the possibility that the true mean is higher than the measured mean because Site areas that are not sampled may have higher constituent concentrations. Listed below are a few Site- specific uncertainties which relate to the EPC calculation.

- Due to small sample data sets (less than ten samples per data set), the maximum detected concentration was used to represent the EPC. This may result in an overestimation of risk.

- COPC concentrations in soil for future use were assumed to be the same as current concentrations, with no adjustment due to migration or degradation. This may overestimate dose.

The reasonable maximum exposure concept was used to develop exposure doses in the current and future scenarios and is defined as the maximum exposure that is reasonably expected to occur at the Site. Several variables that were used to determine the exposure dose for the reasonable maximum exposure were generally based on upper- bound (typically 90th percentile or greater) estimates. These are:

- Maximum detected concentration used to calculate the exposure dose.
- Exposure duration (ED) (upper-bound value).
- Intake/contact rate (IR).
- Exposure frequency (EF).

Therefore, the calculated exposure dose for any given chemical, which results from integration of these variables, typically represents an upper-bound probable exposure dose estimate. The use of these upper bound exposure parameters, coupled with conservative estimates of toxicity, will yield risk results that represent an upper-bound estimate of the occurrence of carcinogenic and noncarcinogenic health effects.

2.7.2 Summary of Ecological Risk Assessment

The Camilla Wood Site has been significantly disturbed from former facility operations and recent remedial actions. The Site has been mostly covered with gravel and backfill following removal actions. Most of the area provides poor habitat conditions for wildlife.

The terrestrial system at the Site is dominated by a sparsely vegetated field where the former facility and log storage area was and the capped sludge area. The minimal vegetative habitat is surrounded by a forest edge community, residential areas, and light industry. The major contaminants of interest at the Site are creosote-related PAHs, dioxins/furans, and PCP. The toxic mechanisms of these compounds are both direct toxicity and bioaccumulation through the food chain. An analysis including the ecosystem at risk, chemicals of ecological concern, assessment/measurement endpoints, conceptual model, and data usability was conducted for the contaminants of concern.

The potential for adverse risk to wildlife from contaminants at the Camilla Wood Site are low and are not ecologically significant. Although a few small areas may pose some risks to individuals that may reside on or adjacent to the Site, populations of local birds and small mammals are not threatened. The overall uncertainty in this assessment has been the general overestimation of potential exposure and subsequent effect levels.

2.8 Remedial Action Objectives

CERCLA and the NCP define Remedial Action Objectives (RAOs) that are applicable to all Superfund Sites. They relate to the statutory requirements for the development of remedial actions.

Site-specific RAOs relate to potential exposure routes and specific contaminated media, such as soil, and are used to identify target areas of remediation and contaminant concentrations. They require an understanding of the contaminants in their respective media and are based upon the evaluation of risk to human health and the environment, protection of groundwater, information gathered during the RI, applicable guidance documents, and federal and state ARARs. RAOs are as specific as possible without unduly limiting the range of alternatives that can be developed for detailed evaluation.

In consideration of the COCs and Remedial Goals (RGs), the RAOs for the Site are as follows:

2.8.1 Soil

The RAOs developed for contaminated soil at the Site are to:

- Prevent ingestion, inhalation, or direct contact with surface soil that contain concentrations in excess of the RGs.
- Control migration and leaching of contaminants in soil to groundwater that could result in groundwater contamination in excess of Maximum Contaminant Levels (MCLs) or health-based levels.
- Prevent ingestion or inhalation of soil particulates in air that contain concentrations in soil in excess of the RGs.
- Permanently and/or significantly reduce the mobility/toxicity/volume (M/T/V) of hazardous waste with treatment.
- Control future releases of contaminants to ensure protection of human health and the environment.

2.8.2 Groundwater RAOs

The RAOs developed for contaminated groundwater at the Site are to:

- Prevent ingestion or direct contact with groundwater containing constituents at concentrations in excess of current federal regulatory drinking water standards (MCLs), current GAEPD MCLs, total HIs greater than 1, and/or a cumulative excess lifetime cancer risk of greater than $1X10^{-5}$.
- Restoration of groundwater to beneficial uses by meeting MCLs in the shallow and intermediate aquifers exclusive of the containment zone.

2.9 Description of Alternatives

The remedial alternatives have been separated by media; however, due to the shallow water table in the shallow aquifer, the remedial alternatives for soil also address the shallow groundwater contamination. The alternatives are grouped by media: S for soil and the shallow water table and GW for intermediate groundwater. Remedial strategies were tailored specifically to conditions within each zone. The alternatives developed for each zone are comprised of the technologies that best fit the range of contaminant concentrations within each zone. Alternatives have been developed using various combinations of general response actions to provide a range of alternatives with respect to the time and methodology required for restoration.

2.9.1 Detailed Remedial Alternatives Evaluation

2.9.1.1 Soil and Shallow Groundwater (S) Alternatives

ALTERNATIVE S1: No Action

Estimated Capital Cost: $0
Estimated Present Worth Cost for Monitoring: $93,850

This alternative is a required component of the Feasibility Study (FS), and provides a comparative basis for the other alternatives. The no action alternative would result in hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure. Therefore, the Five-Year Review Report (5YRR) cycle would be enacted as a consequence of this alternative. Five-year reviews performed over the course of a 30-year period result in a total of six. Optionally, the review can also include a minimal sampling and analysis task (e.g., groundwater samples collected from existing monitoring wells) which would be performed immediately prior to each 5YRR cycle to support the evaluation of Site conditions as part of the Site review process. Analytical costs likely will vary over time for the duration of the action; however, to evaluate and compare costs among alternatives, a single present-worth cost was calculated for a 30-year remediation period.

Overall Protection of Human Health and the Environment
The no action alternative does not eliminate any exposure pathways or reduce the level of risk of the existing soil contamination.

Compliance with ARARs
This alternative does not achieve the RAOs or chemical-specific ARARs established for surface soil. Location- and action-specific ARARs do not apply to this alternative since further remedial actions will not be conducted.

Long-Term Effectiveness and Permanence
The remediation goals derived for protection of human health and the environment would not be met. Because contaminated soil remains under this alternative, a review/reassessment of the conditions at the Site would be performed at five-year intervals to ensure that the remedy does not become a greater risk to human health and the environment.

Reduction of Mobility/Toxicity/Volume (M/T/V) through Treatment
No reductions in contaminants' mobility/toxicity/volume (M/T/V) are realized under this alternative.

Short-Term Effectiveness
Since no further remedial action would be implemented at this Site, this alternative poses no short-

term risks to On-Site workers. It is assumed that Level D personal protective equipment would be used when sampling various media.

Implementability

This alternative could be implemented immediately since monitoring equipment is readily available and procedures are in place.

Cost

The total present worth cost for this alternative is approximately $93,850.

ALTERNATIVE S2: Excavation, *Ex Situ* Solidification/Stabilization (S/S), Off-Site Disposal, and Containment, Monitored Natural Attenuation, Compression Grouting

Estimated Capital Cost: $19,131,590
Estimated O&M Cost: $13,360,500
Estimated Present Worth Cost: $32,492,090

Alternative S2 entails the excavation of surface soils with contaminant concentrations above the target cleanup levels, then *ex situ* solidification/stabilization (S/S) and off-Site disposal of the treated material. The contaminated soils will be excavated using standard earthmoving equipment. The surface soil excavations will extend to a depth of one foot bgs. Subsurface soils will only be excavated in areas outside the vertical barrier wall and will extend to only the groundwater table at most (expected to be approximately five ft bgs). It should also be noted that even those excavations above the water table may encounter perched groundwater which will require dewatering. Included in this alternative are appropriate remedy support tasks that facilitate or support the effectiveness of the primary remedy components.

In general, an ex situ S/S system would involve an assembly of mixers, chemical storage, feeding devices, pumps, conveyers, and ancillary equipment. The actual choice and configuration of equipment would be decided by the treatment approach. Typically, a pug mill is used to mix soils with S/S reagents in either a batch or continuous mode. Treatability studies would be needed to determine appropriate S/S techniques and reagents for the Camilla Wood contaminants. Also, leachability analyses would be needed to confirm effectiveness of the S/S.

After the contaminated soils have been treated, the material will be disposed off-Site at an appropriate non-hazardous or hazardous waste landfill depending on the characteristics of the treated soil. The S/S soils will be tested to verify that they meet the disposal criteria of the landfill.

Alternative S2 also consists of the installation of a vertical barrier wall around the shallow groundwater source area and *in situ* compression grouting (to remediate karst features which could provide a pathway for contamination to migrate from the shallow zone to the intermediate zone).

Those areas in the surficial aquifer that are outside of the vertical barrier wall will be remediated to meet remedial goals through the use of monitored natural attenuation. An April 21, 1999, EPA guidance document entitled "Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" sets out those conditions where MNA is an acceptable approach for remediating groundwater and the lines of evidence necessary to demonstrate that MNA is an appropriate remedy for a Site. One line of evidence described is that historical groundwater and/or soil chemistry data that demonstrate a clear and meaningful trend of decreasing contaminant mass and/or concentration over time at appropriate monitoring or sampling points. Historical groundwater contaminant information data indicate a decrease in Site-related contaminants over a period of time at groundwater monitoring locations outside of the source area in the surficial aquifer. A second line of evidence addressed in the EPA MNA guidance document is the use of hydrogeologic and geochemical data that can be used to demonstrate indirectly the type(s) of natural attenuation processes active at the site, and the rate at which such processes will reduce contaminant concentrations to required levels. Dissolved oxygen and pH concentrations in source material that correspond to natural biodegradation rates demonstrate that natural attenuation processes are active at the Site.

Overall Protection of Human Health and the Environment

Successful implementation of this alternative would reduce risks to acceptable levels to human health and the environment to human health and the environment and meet the removal action objectives by (1) eliminating exposure of recreational users to waste material by direct contact and airborne migration, (2) eliminating migration of contaminants from source soils to shallow groundwater, and (3) eliminating the migration of contaminants from shallow groundwater to intermediate groundwater. The threat of direct human exposure to contaminated waste and physical hazards would be reduced by this alternative. The removal of a minimum of one foot of contaminated soil in areas exceeding the surface soil RGs along with the placement of a minimum of one foot of clean fill will reduce the risks associated with direct contact, ingestion, and inhalation.

Compliance with ARARs

Alternative S2 will comply with the applicable or relevant and appropriate transportation and disposal standards established in the Solid Waste Disposal Act.

Long-Term Effectiveness and Permanence

The containment of shallow groundwater eliminates the need to apply subsurface soil RGs designed to be protective of groundwater within the containment area. The excavation, treatment, and off-Site disposal of a minimum of one foot of contaminated surface soil within the containment area will be a permanent measure to effectively reduce risks to acceptable levels for direct contact, ingestion, and inhalation; and since the soil excavated from the Site will be treated, disposed off-Site, and replaced with clean fill, the long-term effectiveness can not be reduced due to the potential for rebound or reversal. The long-term effectiveness and permanence of the containment component of the remedy could potentially be impacted if additional sinkholes continue to manifest at the Site, particularly within the containment area.

Reduction of M/T/V through Treatment

The primary objective of this alternative is to reduce contaminant mobility in the source area through containment within a zone surrounded by a vertical barrier wall. In addition, contaminated surface soil and subsurface soil excavated from the Site will be treated via *ex situ* S/S, which also reduces contaminant mobility. Contaminant toxicity and volume would not be reduced. Contaminant mobility is expected to be reduced to an extent that would result in overall risk reduction from all pathways and exposure routes.

Short-Term Effectiveness

The construction phase of this alternative would likely be accomplished within one field season; therefore, impacts associated with construction would likely be short term and minimal. Short-term impacts are associated with excavation, treatment, barrier wall construction, and jet or compression grouting; however, these potential, short-term impacts would be mitigated during the construction phase.

If the excavated material is dry, on-Site workers will be exposed to waste soil dust during excavation and treatment activities. Ingestion of dust could involve some health effects because of the high level of contaminants in waste soil.

On-Site workers would be adequately protected from short-term risks by using appropriate personal protective equipment and by following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur during soil excavation and treatment and grading. Dust emissions would be monitored at the property boundaries. Fugitive dust emissions would be controlled by applying water as needed to surfaces receiving heavy vehicular traffic or in excavation areas. A measurable, short-term impact to the surrounding area would include increased vehicular traffic and associated safety hazards, potential dust generation, and noise.

Implementability

Excavation and stabilization of contaminated soil is offered by numerous vendors. This alternative utilizes standard construction practices and material handling equipment. No significant construction issues are expected to be encountered. The construction of barrier walls is also a common construction practice offered by many vendors, and there are numerous methods of installation from conventional excavators and clamshells, to cutter soil mixing which allows for flexibility in selecting the most appropriate installation method to suit specific characteristics of a given Site.

Wastewater may be generated during implementation of this alternative through water runoff generated as a result of dust emission control. Wastewater may also be generated as a result of decontamination activities required for equipment and On-Site workers. Containment and treatment or disposal of these waste waters may be required. Depending upon the treatment methodology selected, the waste water may be able to be utilized in the soils treatment process.

All services and materials for this alternative are readily available.

Cost

The total present worth cost for this alternative is approximately $32,492,090. Estimated capital costs are approximately $19,131,590 and estimated O&M costs are approximately $13,360,500.

ALTERNATIVE S3: Removal, On-Site Treatment, and On-Site Disposal

Estimated Capital Cost: $53,023,750
Estimated O&M Cost: $30,340

Estimated Present Worth Cost: $53,054,090

Alternative S3 involves excavation of all contaminated soils at the Site in excess of the Site cleanup levels, including soil below the water table. Excavation of contaminated soils below the water table will require dewatering the excavation area and the installation of sheet piles to keep water out of the excavation. Due to the observations of free product in two shallow monitoring wells (MW05S and MW07S) in the north and east portions of the Site in the vicinity of the former cooling ponds and treatment process areas, DNAPL is expected to be encountered during excavation and dewatering activities. The vertical extent of the soil contamination has not been delineated at the Site, but the presence of free product in the northern and eastern portions of the Site strongly suggest the possibility that contamination in excess of RGs may extend to the clay aquitard particularly in the former pond and process areas. The surface soil excavations will extend to a depth of one foot bgs and the subsurface soil excavations will extend to the depth where there are no detections in excess of the RGs for subsurface soil at the Site. Excavations to a depth of five feet or less can be performed using standard excavation techniques. It should also be noted that even those excavations above the water table may encounter perched groundwater which will require dewatering. Included in this alternative are appropriate remedy support operations and tasks that facilitate or support the effectiveness of the active remedy components.

The *ex situ* treatment technologies that passed the screening process are thermal desorption, bioremediation, and *ex situ* chemical oxidation. Treatability studies will be performed during the remedial design (RD) to determine the most effective treatment technology. For the 2009 RI/FS, it was assumed that thermal desorption treatment will be the most efficient method to remediate the contaminated soils (Black & Veatch, 2009).

<u>Overall Protection of Human Health and the Environment</u>
Successful implementation of this alternative would reduce risks to acceptable levels to human health and the environment to acceptable levels and meet the removal action objectives by (1) removal and treatment of all soils On-Site which exceed RGs for the Site, eliminating exposure of recreational users to waste material by direct contact and airborne migration, (2) eliminating exposure of recreational users to waste material by direct contact and airborne migration, and (3) eliminating the migration of contaminants to groundwater and surface water. The threat of direct human exposure to contaminated waste and physical hazards would be eliminated by this alternative. Treatment of the waste material would eliminate contaminant exposure through the receptor routes of ingestion and inhalation. Contaminated soil would be treated and converted to a non-hazardous material. The waste will be immobilized by treatment and disposed back On-Site. This would eliminate the direct contact exposure pathway and also eliminate any further contaminant migration from the Site soils.

<u>Compliance with ARARs</u>
This alternative is expected to be in compliance with all ARARs. The thermal desorption unit must be in compliance with all local, state, and federal air emission requirements.

<u>Long-Term Effectiveness and Permanence</u>
This alternative is expected to provide excellent long-term effectiveness and permanence. The Site cleanup levels for soil will be met and migration of contaminants from soil to groundwater would be

reduced to acceptable levels.

Reduction of M/T/V Through Treatment

The primary objective of this alternative is to reduce contaminant toxicity, mobility, and volume through treatment. This is a permanent treatment measure.

Short-Term Effectiveness

The construction phase of this alternative would likely be accomplished within two field seasons; therefore, impacts associated with construction would likely be short term and minimal. Short-term impacts are associated with excavation, treatment, and dewatering activities; however, these potential, short-term impacts would be mitigated during the construction phase.

The treated material will be disposed on Site; therefore, there are no short-term impacts due to transportation of treated material to an off-Site facility.

If the excavated material is dry, on-Site workers will be exposed to waste soil dust during excavation and consolidation activities. Ingestion of dust could involve some health effects because of the high level of contaminants in waste soil.

On-Site workers would be adequately protected from short-term risks by using appropriate personal protective equipment and by following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur during waste excavation, treatment, and grading. Dust emissions would be monitored at the property boundaries. Fugitive dust emissions would be controlled by applying water as needed to surfaces receiving heavy vehicular traffic or in excavation areas. A measurable, short-term impact to the surrounding area would include increased vehicular traffic and associated safety hazards, potential dust generation, and noise.

Implementability

Excavation and treatment of contaminated soil is offered by numerous vendors. On-Site treatment utilizes standard construction practices and material handling equipment. Due to the anticipated depth of contamination in the highly contaminated source areas of the Site and the shallow water table, significant dewatering is expected. In addition, high concentrations of Site-related contaminants and free product are expected to be present in the groundwater which will be extracted during excavation dewatering activities; therefore, treatment of the water is expected to be required prior to discharge.

All services and materials for this alternative are readily available.

Cost

The total present worth cost for Alternative S3 is approximately $53,054,090. Estimated capital costs are $53,023,750 and estimated O&M costs are $30,340.

ALTERNATIVE S4: Excavation, *In Situ* Source Treatment, *Ex Situ* Stabilization/Solidification Off-Site Disposal, Compression Grouting, Storm Water Improvements

Estimated Capital Cost: $29,103,760

Estimated O&M Cost: $30,340
Estimated Present Worth Cost: $29,134,100

Alternative S4 involves excavation of contaminated soils in the source area (along north and east boundaries of the Site in the vicinity of the cooling ponds and treatment process areas) to the water table, followed by *in situ* S/S within the source area below the water table to the clay aquitard (typically encountered within 20 feet of ground surface). Alternative S4 also includes excavation of the top two feet of contaminated soil with concentrations exceeding Site cleanup levels. Excavated soil will be stabilized/solidified along with the 10,000 cubic yard (cy) covered contaminated soil pile for off-Site disposal. To prevent or reduce continued migration of contaminated groundwater from the shallow zone to the intermediate zone, karst features previously and yet to be identified which are found to be sources of migration from the shallow to the intermediate zone will be sealed using compression or jet grouting. Excavations to a depth of five feet or less can be performed using standard excavation techniques. It should also be noted that even those excavations above the water table may encounter perched groundwater which will require dewatering. Included in this alternative are appropriate remedy support tasks that facilitate or support the effectiveness of the primary remedy components.

Overall Protection of Human Health and the Environment

Successful implementation of this alternative would reduce risks to acceptable levels to human health and the environment to acceptable levels and meet the RAOs by (1) eliminating exposure of recreational users to waste material by direct contact and airborne migration, (2) eliminating migration of contaminants from soil to shallow groundwater, and (3) eliminating the migration of contaminants from shallow groundwater to intermediate groundwater. The threat of direct human exposure to contaminated waste and physical hazards would be reduced by this alternative. The combination of treatment and removal of the waste material would eliminate contaminant exposure through the receptor routes of direct contact, ingestion, and inhalation. Contaminated soil would be treated and converted to meet the Site cleanup levels. Removal of waste would mitigate contaminant migration from the Site.

Compliance with ARARs

This alternative is expected to be in compliance with ARARs. The soil treatment, transportation, and disposal must be in compliance with Federal solid waste disposal regulations.

Long-Term Effectiveness and Permanence

Treatability testing will be required to ensure that the treatment goals can be achieved. Successful S/S treatment will permanently reduce the mobility of the contaminated soils. Based on successful completion of bench-scale testing, this alternative is expected to provide adequate long-term effectiveness and permanence. Land use restrictions, including over the in situ treated soil area at the Camilla Wood Site may still be required.

Reduction of M/T/V through Treatment

The primary objective of this alternative is to reduce contaminant mobility through treatment. The toxicity and volume of contamination would not be reduced.

Short-Term Effectiveness

The construction phase of this alternative would likely be accomplished within one field seasons; therefore, impacts associated with construction would likely be short- term and minimal. Short-term impacts are associated with excavation, *in situ* and *ex situ* solidification/stabilization, and transportation for off-Site disposal of waste soil; however, these potential, short-term impacts would be mitigated during the construction phase.

If the excavated material is dry, on-Site workers will be exposed to waste soil dust during excavation and solidification/stabilization activities. Ingestion of dust could involve some health effects because of the high level of contaminants in waste soil.

On-Site workers would be adequately protected from short-term risks by using appropriate personal protective equipment and by following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur during waste consolidation and grading, and transportation of treated waste for off-Site disposal. Monitoring of dust emissions would be conducted at the property boundaries. Fugitive dust emissions would be controlled by applying water as needed to surfaces receiving heavy vehicular traffic or in excavation areas. A measurable, short-term impact to the surrounding area would include increased vehicular traffic and associated safety hazards, potential dust generation, and noise.

Implementability

In situ and *ex situ* S/S of contaminated soil is offered by numerous vendors. *In situ* and *ex situ* S/S utilizes standard construction practices and material handling equipment. No significant construction issues are expected to be encountered.

Waste water may be generated during implementation of this alternative through excavation dewatering or through water runoff generated as a result of dust emission control. Waste water may also be generated as a result of decontamination activities required for both equipment and on-Site workers. Containment and treatment or disposal of these waste waters may be required. Depending upon the treatment methodology selected, the waste water may be able to be utilized in the soils treatment process.

No state or federal permits are expected to be required; however, advance consultation should occur in planning the action to ensure that all involved agencies are allowed to provide input.

All services and materials for this alternative are readily available.

Cost

The total present worth cost for this alternative is approximately $29,134,100. Estimated capital costs are $29,103,760 and estimated O&M costs are $30,340.

ALTERNATIVE S5: *In Situ* Stabilization/Solidification Source Containment, Monitored Natural Attenuation and Storm Water Improvements

Estimated Capital Cost: $10,660,980
Estimated O&M Cost: $30,340
Estimated Present Worth Cost: $10,691,320

Alternative S5 involves *in situ* S/S of contaminated soils in the source area (along north and east boundaries of the Site in the vicinity of the cooling ponds and treatment process areas) to the water table. Alternative S5 also includes *in situ* S/S of the top two feet of contaminated soil with concentrations exceeding Site cleanup levels outside the highly contaminated source area. To prevent or reduce continued migration of contaminated groundwater from the shallow zone to the intermediate zone, karst features previously and yet to be identified which are found to be sources of migration from the shallow to the intermediate zone will be sealed using compression or jet grouting. In order to prevent continued migration of contaminants from the highly contaminated shallow groundwater source area, a vertical barrier wall will be installed around the perimeter of the source area. Included in this alternative are appropriate remedy support tasks that facilitate or support the effectiveness of the primary remedy components. PCP groundwater contamination above remedial goals in the shallow aquifer outside of the "source area" vertical barrier wall will be addressed through monitored natural attenuation. Shallow groundwater PCP data from the Site demonstrates that after four previous soil, surface water, and waste removal actions, the pentachlorophenol contaminant levels have decreased markedly over time. EPA believes that this reduction of source material in great part has lead to PCP contaminant reductions in the surficial aquifer. In addition, the shallow aquifer has the appropriate natural conditions in place so that natural processes already present will continue to aid in the reduction of pentachlorophenol contaminant concentrations. Finally, as part of the proposed remedial action, a slurry wall will be installed in the surficial aquifer to physically isolate source material which has contributed to dissolved-phase PCP concentrations above remedial goals. As part of the remedial design and remedial action phases of the Site cleanup, EPA will routinely monitor PCP concentrations outside of the "source area" vertical barrier wall to ensure that PCP contaminant reductions take place until remedial goals are met.

Since Alternative S5 will render a large area of the Site impermeable, the alternative will have to include storm water improvements and enhancements to offset the reduction in infiltration. These storm water improvements will be developed during the RD phase.

<u>Overall Protection of Human Health and the Environment</u>

Successful implementation of this alternative would reduce risks to acceptable levels to human health and the environment to acceptable levels and meet the RAOs by (1) eliminating exposure of recreational users to waste material by direct contact and airborne migration, (2) eliminating migration of contaminants from soil to shallow groundwater, and (3) eliminating the migration of contaminants from shallow groundwater to intermediate groundwater. The threat of direct human exposure to contaminated waste and physical hazards would be reduced by this alternative. The S/S of the waste material would reduce contaminant exposure through the receptor routes of direct contact, ingestion, and inhalation. Contaminated soil would be treated and converted to meet the Site cleanup levels.

<u>Compliance with ARARs</u>

This alternative is expected to be in compliance with ARARs. The dust suppression and control requirements apply to activities, such as *in situ* soil mixing, associated with this alternative. ARARs for the control of fugitive dust emissions would be met by applying water to roads receiving heavy vehicular traffic and to S/S operations, as necessary.

Long-Term Effectiveness and Permanence
Treatability testing will be required to ensure that the treatment goals can be achieved. Successful S/S treatment will permanently reduce the mobility of the contaminated soils. Based on successful completion of bench-scale testing, this alternative is expected to provide adequate long-term effectiveness and permanence. Land use restrictions over the *in situ* treated soil area at the Camilla Wood Site may still be required.

Reduction of M/T/V through Treatment
The primary objective of this alternative is to reduce contaminant mobility through treatment. The toxicity and volume of contamination would not be reduced.

Short-Term Effectiveness
The construction phase of this alternative would likely be accomplished within one field season; therefore, impacts associated with construction would likely be short-term and minimal. Short-term impacts are associated with *in situ* S/S; however, these potential, short-term impacts would be mitigated during the construction phase.

If the contaminated soil is dry, On-Site workers will be exposed to waste soil dust during solidification/stabilization activities. Ingestion of dust could involve some health effects because of the high level of contaminants in waste soil.

On-Site workers would be adequately protected from short-term risks by using appropriate personal protective equipment and by following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur during waste consolidation and grading. Monitoring of dust emissions would be conducted at the property boundaries. Fugitive dust emissions would be controlled by applying water as needed to surfaces receiving heavy vehicular traffic or in excavation areas. A measurable, short-term impact to the surrounding area would include increased vehicular traffic and associated safety hazards, potential dust generation, and noise.

Implementability
In situ S/S of contaminated soil is offered by numerous vendors. *In situ* S/S utilizes standard construction practices and material handling equipment. No significant construction issues are expected to be encountered.

Wastewater may be generated during implementation of this alternative through water runoff generated as a result of dust emission control. Wastewater may also be generated as a result of decontamination activities required for both equipment and on-Site workers. Containment and treatment or disposal of these waste waters may be required. Depending upon the treatment methodology selected, the waste water may be able to be utilized in the soils treatment process.

No state or federal permits are expected to be required; however, advance consultation should occur in planning the action to ensure that all involved agencies are allowed to provide input.

All services and materials for this alternative are readily available.

Cost
The total present worth cost for this alternative is approximately $10,691,320. Estimated capital costs are $10,660,980 and estimated O&M costs are $30,340.

2.9.1.2 Intermediate Groundwater (GW) Alternatives

ALTERNATIVE GW1: No Action

Estimated Capital Cost: $0
Estimated O&M Cost: $184,680
Estimated Present Worth Cost: $184,680

Alternative GW1 would not involve any remedial actions, and the Site would remain in its present condition. This alternative, required by the NCP and CERCLA, is a baseline alternative against which the effectiveness of the other alternatives can be compared. Under the no action alternative, the Site is left "as is" and no funds would be expended for monitoring, control, or cleanup of the contaminated groundwater. However, 5-year reviews of the Site would be required under CERCLA; therefore, funds would be expended to conduct the reviews. It is anticipated that each 5-year review would consist of a Site visit and report preparation.

Overall Protection of Human Health and the Environment
The no action alternative does not eliminate any exposure pathways or reduce the level of risk of the existing groundwater contamination.

Compliance with ARARs
This alternative does not achieve the RAOs or chemical-specific ARARs established for groundwater. Location- and action-specific ARARs do not apply to this alternative since further remedial actions will not be conducted.

Long-Term Effectiveness and Permanence
The continued exposure of groundwater to On-Site receptors and surface water is a potential long-term impact of this alternative. The remediation goals derived for protection of human health and the environment would not be met. Because contaminated groundwater remains under this alternative, a review/reassessment of the conditions at the Site would be performed at 5-year intervals to ensure that the remedy does not become a greater risk to human health and the environment.

Reduction of M/T/V Through Treatment
No reductions of contaminant M/T/V are realized under this alternative.

Short-Term Effectiveness
Since no further remedial actions would be implemented at the Site, this alternative poses no short-term risks to On-Site workers. It is assumed that Level D personal protective equipment would be used when sampling the various media.

Implementability

This alternative could be implemented immediately since monitoring equipment is readily available and procedures are in place.

Cost

The total present worth cost for this alternative is approximately $184,680. There are no capital costs associated with this alternative.

ALTERNATIVE GW2: *In Situ* Chemical Oxidation/Bioaugmentation

Estimated Capital Cost: $2,656,880
Estimated O&M Cost: $272,080
Estimated Present Worth Cost: $2,928,960

For this alternative, injection points would be installed within the contaminant plume to deliver a chemical oxidant to treat the higher concentrations of dissolved phase contamination in the intermediate aquifer. A treatability study conducted on contaminated groundwater and aquifer material from the Site determined that treatment using potassium permanganate would effectively reduce groundwater contaminant concentrations in the intermediate aquifer to below the RGs for the Site. In addition, the portions of the aquifer with lower concentrations will be augmented with oxygen or an additive to enhance the natural degredation of Site contaminants. A treatability study will be conducted during the design phase to determine the most appropriate methods for the circumstances at the Site.

Overall Protection of Human Health and the Environment

In situ chemical oxidation of contaminated groundwater at the concentrations observed in the intermediate groundwater zone virtually reduce all risks associated with the exposure pathways as long as the source of the migration from the shallow zone to the intermediate zone is identified and mitigated. The chemical oxidation treatability study concluded that contaminant concentrations could be effectively reduced to levels below the MCLs assuming that the treatment is appropriately designed, installed, and operated.

Compliance with ARARs

All action-specific and chemical-specific ARARs are expected to be met. The treatability study demonstrated that groundwater cleanup levels could be achieved in a matter of days using reasonable quantities of chemical oxidant.

Long-Term Effectiveness and Permanence

The chemical oxidation process is a permanent reaction that is not subject to recontamination due to a reversible chemical reaction. Chemical oxidation is very effective for the dissolved phase contaminants in the intermediate zone at the Camilla Wood Site. The long term effectiveness and permanence of the alternative relies on the success of the combined Site-wide remedy in mitigating the migration of contamination from the shallow source zone to the intermediate zone.

Routine groundwater monitoring would be required throughout the life of the remedy.

Reduction of M/T/V through Treatment

The primary objective of this alternative is to reduce the toxicity and volume of the contaminants in the groundwater. As stated above, this alternative relies on the success of other Site-wide remedy components, such as containment, for the source area to prevent future migration of contamination from the shallow zone.

Short-Term Effectiveness

The construction phase of this alternative would most likely be accomplished within one season, therefore, impacts associated with construction would likely be short term and minimal. Short-term impacts are associated with the installation of a relatively large number of closely-spaced injection points.

On-Site workers would be adequately protected from short-term risks by using appropriate personal protective equipment and by following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur during construction activities. Dust emissions would be monitored at the property boundaries. Control of fugitive dust emissions would be provided by applying water as needed to surfaces receiving heavy vehicular traffic.

Implementability

The services for the installation of injection points are offered by many vendors. The target depth and the lithology for the injection zone do not require specialized equipment. The chemical oxidant could be applied via direct push to reduce costs if a single application is determined to be appropriate. Otherwise, permanent injection wells could be installed at greater cost but with the added flexibility of allowing periodic future doses of chemicals if necessary.

Waste water may be generated during implementation of this alternative through water runoff generated as a result of dust emission control. Waste water may also be generated as a result of decontamination activities required for equipment and on-Site workers. Containment and treatment or disposal of these waste waters may be required.

No state or federal permits are expected to be required; however, advance consultation should occur in planning the action to ensure that all involved agencies are allowed to provide input.

All services and materials for this alternative are readily available.

Cost

The total present worth for Alternative GW2, is approximately $2,928,960. Estimated capital costs are $2,656,880 and estimated O&M costs are $272,080.

2.9.2 Common Elements and Distinguishing Features of the Alternatives

Common elements of the alternatives include the excavation of the contaminated soils in the source area (S2, S3, and S4). Alternatives S2 and S4, both involve *ex situ* stabilization/solidification of the excavated soils, as well as off Site disposal. Another common element is the use of stabilization/solidification for the contaminated soils (S2, S4, and S5). Alternatives S4 and S5, both involve *in situ* stabilization/solidification, however, each alternative has a different target depth for the S/S application. The stabilization/solidification remedial alternatives all provide treatment to reduce the toxicity and mobility of the Site contaminants. Alternatives S2 and S5 both provide a barrier wall around the untreated areas. All remedial alternatives that incorporate active remediation (S2, S3, S4, S5, and GW2) involve reasonably well-established technologies that can be readily implemented.

2.10 Comparative Analysis of Alternatives

The thirteen remedial alternatives have been examined with respect to evaluation requirements in the NCP (40 CFR Part 300.430[e][9]iii), CERCLA, and factors described in *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). The nine evaluation criteria include the following:

Threshold Criteria

- Overall protection of human health and the environment; and,
- Compliance with ARARs.

Balancing Criteria

- Short-term effectiveness;
- Long-term effectiveness and permanence;
- Reduction of mobility, toxicity, or volume through treatment;
- Implementability; and,
- Cost.

Modifying Criteria

- State acceptance; and
- Community acceptance.

This section presents a comparative analysis of the soil and groundwater alternatives based on the threshold and balancing evaluation criteria. The objective of this section is to compare and contrast the alternatives to support selection of the Site remedy. The alternatives are presented here to give decision makers a range of potential actions that could be taken to remediate this Site. The alternatives compared include:

Soil and Shallow Groundwater Alternatives

- Alternative S1 No Action.
- Alternative S2 Soil Excavation, *Ex Situ* Solidification/Stabilization, Off-Site Disposal, and Shallow Groundwater Containment.
- Alternative S3 Removal, On-Site Treatment, and On-Site Disposal.

- Alternative S4 Excavation, *In Situ* Source Treatment, *Ex Situ* Stabilization/Solidification, Off-Site Disposal, and Compression Grouting.
- Alternative S5 *In Situ* Solidification/Stabilization, Source Containment, Monitored Natural Attenuation, and Storm Water Improvements.

Intermediate Groundwater Alternatives

- Alternative GW1 No Action.
- Alternative GW2 *In Situ* Chemical Oxidation.

Table 21 presents a summary of each soil remedial alternative along with ranking scores for each evaluation criterion. Table 22 presents a summary of each groundwater remedial alternative along with ranking scores for each evaluation criterion. Each alternative's performance against the criteria was ranked on a scale of 0 to 5, with 0 indicating that none of the criterion's requirements were met and 5 indicating all of the requirements were met. The ranking scores are not intended to be quantitative or additive, but rather are only summary indicators of each alternative's performance against the CERCLA evaluation criteria. The ranking scores combined with the present worth costs provide the basis for comparison among alternatives.

For soils, Alternatives 2, 4 and 5 rank higher than Alternatives 1 and 3 in overall protection of human health and the environment. Alternatives 2, 3, 4, and 5 rank higher than Alternative 1 in compliance with ARARs and long-term effectiveness and permanence, and reduction of M/T/V. Alternatives 4 and 5 rank higher than Alternatives 2 and 3 in short term effectiveness. Alternatives 2 and 5 rank higher than Alternatives 3 and 4 in implementability. Alternative 1 ranks higher than the all the other alternatives in short term effectiveness and implementability.

For groundwater, Alternative 2 ranks higher than Alternative 1 for all criteria except short-term effectiveness, implementability, and cost.

An overall score was calculated for each alternative by adding up each rating, including a rating for cost, and dividing the sum by 7. The overall score is a subjective rating of the relative performance of each alternative in best meeting the 7 criteria. The recommended alternative is the alternative which is expected to have the best overall relative performance with respect to the 7 criteria and therefore has the highest overall score.

2.10.1 Overall Protection of Human Health and the Environment

Alternative S1 would not be protective. Alternatives S2, S3, S4, and S5 would all provide high levels of protection of human health and the environment. All alternatives have elements that are more protective than the others to some degree. For instance, although Alternative S3 would be the most protective after completion of the remedy, the construction aspects associated with dewatering and excavating below the water table would increase the risks of exposure to workers and nearby residents during construction activities.

Similarly, Alternative GW1 would not be protective. Alternative GW2 would reduce contaminant levels in the intermediate aquifer to below the remedial goals for the Site.

2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at Superfund Sites attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

Applicable requirements are those cleanup levels, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal or State environmental laws or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a Superfund Site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup levels, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal or State environmental laws or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a Superfund Site, address problems or situations sufficiently similar to those encountered at the Superfund Site that their use is well suited to the particular Site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate. Compliance with ARARs addresses whether a remedy will meet all of the ARARs of other Federal and State environmental statutes or provides a basis for invoking waiver.

Each remedial alternative is evaluated for its compliance with ARARs as defined in CERCLA Section 121(f). The following items must be considered during the evaluation:

- Compliance with chemical-specific ARARs (e.g., MCLs). This consideration includes whether chemical-specific ARARs can be met and whether a waiver may be appropriate if they cannot be met.
- Compliance with location-specific ARARs (e.g. protection of historic Sites, regulations regarding activities near wetlands/floodplains). This consideration includes whether location-specific ARARs can be met or waived.
- Compliance with action-specific ARARs (e.g. RCRA treatment technology standards). This consideration includes whether action-specific ARARs can be met or waived.

Chemical-specific, action-specific, and location-specific ARARs are identified in Tables 23, 24, and 25.

The No Action alternatives (S1 and GW1) do not achieve RAOs or comply with chemical-specific ARARs. Alternatives S2 through S5 and GW2 are all anticipated to comply with ARARs over the long term and will be evaluated against the remaining criteria.

Except for any contaminant mass that exists until cleanup levels are met, no temporary (short-term) non-compliance with ARARs is expected in any of the alternatives. All alternatives incorporating active remediation likely would comply with all location- and action-specific ARARs and would be designed to comply with all chemical-specific ARARs given enough time (Tables 21 and 22).

2.10.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain following remediation and the adequacy and reliability of controls. Each alternative, except the No Action Alternatives S1 and GW1, provide long-term protection because all the remaining alternatives will attain protect human health and the environment as well as assure compliance with ARARs within a reasonable timeframe. Evaluation of the long-term effectiveness and permanence of a remedial alternative addresses the results of a remedial alternative in terms of the risk remaining at the Site after RAOs are achieved. Long-term effectiveness is evaluated based on the following three factors:

- Magnitude of the remaining risk. This consideration addresses the residual risk remaining from untreated waste or treatment residuals at the end of the remedial activities;
- Adequacy of controls. This consideration addresses the adequacy and suitability of the controls, if necessary, that are used to manage the treatment residuals or untreated wastes that remain at the Site; and
- Reliability of the controls. This consideration addresses the long-term reliability of management controls, if used, for providing continued protection from the treatment residuals or untreated wastes.

Alternatives that physically remove contaminants from the Site media, such as Alternative S3, provide the most protection for the longest period of time (i.e., contaminants present at the initiation of the remedial action do not return to the Site). Unfortunately, isolation-based remedial alternatives do not provide that benefit to a Site. The long-term effectiveness and permanence of containment-based remedies rely on the long-term stability of the geochemical conditions for long-term protectiveness. Alternative S2 would leave contamination below the water table within an impermeable barrier wall; however, barrier walls have been demonstrated to be effective over long periods for Sites with similar conditions to those found at the Camilla Wood Treatment Site. The long-term effectiveness of Alternatives S4 and S5 are expected to be similar to Alternative S2.

2.10.4 Reduction of Mobility, Toxicity, or Volume Through Treatment

Reduction of M/T/V through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. This criterion addresses the statutory preference for selecting a remedial action that employs treatment technologies that are able to permanently and significantly reduce the M/T/V of the COCs as their principal element. The ability of a remedial alternative to reduce the M/T/V of the COCs is evaluated based on the following five factors:

- The treatment processes, the remedies employed and the materials they treat;
- The amount (mass or volume) of hazardous materials that will be destroyed or treated by the remedial alternative, including how the principal threat(s) will be addressed;
- The degree of expected reduction in M/T/V of COCs, measured as a percentage of reduction or order of magnitude;
- The degree to which the treatment is irreversible; and
- The type and quantity of treatment residuals that would remain following the treatment actions.

All of the remedial alternatives which met the threshold criteria contain some degree of treatment as a primary component of the remedy. Alternative S3 provides the greatest reduction of T/M/V by completely removing all soil above and below the water table which exceeds the remedial goals for the Site and treating it to levels which achieve remedial goals which are protective. The S/S remedial alternatives (Alternatives S2, S4, and S5) all provide treatment to reduce the toxicity and mobility of Site contaminants. Between Alternatives S2, S4, and S5, Alternative S4 provides a greater degree of source treatment because a larger volume of highly contaminated source soils are stabilized which reduces both toxicity and mobility. Alternatives S2 and S5 compensate by providing added containment in the form of a vertical barrier wall around the untreated areas.

2.10.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during remedial action until cleanup levels are achieved. The short-term effectiveness of a remedial alternative is evaluated with respect to its effect on human health and the environment during its implementation. Short-term effectiveness is evaluated based on the following four factors:

- Protection of the community during the remedial action. This consideration addresses any risk that results from the implementation of the remedial action (i.e., dust from an excavation) that may affect human health;
- Protection of workers during the remedial action. This consideration addresses threats that may affect workers and the effectiveness and reliability of protective measures that may be taken;
- Environmental impacts. This consideration addresses the potential adverse environmental impact that may result from the implementation of the remedial alternative and evaluates how effective available mitigation measures would be able to prevent or reduce the impact; and
- The amount of time required until the RAOs are achieved. This consideration includes an estimate of the time required to achieve protection for the entire Site or for individual elements associated with specific Site areas or threats.

The short-term effectiveness of remedial alternatives relates to how well human health and the environment are protected (the first threshold criterion) and attains ***ARARs*** (the second threshold criterion) during implementation. The No Action alternative is the best approach for minimizing added exposure or risk to receptors in the short-term.

In some cases, implementation of the alternative could temporarily increase risk and exposure pathways to receptors. All alternatives evaluated for this Site disrupt the local environment to some degree. Alternative S3 requires the installation of sheet piling and dewatering the shallow aquifer to allow excavation of all contaminated soils and NAPL above Site remedial goals, within constraints created by the Site's physical configuration. Alternatives S2 and S4 require Off-Site disposal and would therefore increase risks somewhat due to the transportation of contaminated material between the Site and the Off-Site disposal location. Alternative S5 would provide the best level of short-term effectiveness among the active treatment alternatives since the remedy would be implemented *in situ*. The effectiveness of remedial actions at ensuring short-term protection during implementation of a remedial action depends on the care and attention to detail exhibited by the remediation personnel.

2.10.6 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, access, administrative feasibility, and coordination with other governmental entities are also considered.

This criterion addresses the technical and administrative feasibility of implementing a remedial alternative and the availability of various services and/or materials/supplies required during the implementation. The implementability of a given remedial alternative is evaluated based on the following factors:

<u>Technical Feasibility</u>

- Construction and operation. This consideration relates to the technical difficulties and unknown aspects associated with a given technology;
- Reliability of a technology. This consideration focuses on the ability of a technology to meet specified process efficiencies and performance goals, including whether technical problems may lead to schedule delays;
- Ease of undertaking additional remedial actions. This consideration includes a discussion of what, if any, future remedial actions may need to occur and how difficult it would be to implement them; and
- Monitoring considerations. This consideration addresses the ability to monitor the effectiveness of the remedial actions and includes an evaluation of the risks of exposure if monitoring is determined to be insufficient to detect a system failure.

<u>Administrative Feasibility</u>

- Both the ability and time required to coordinate with other offices and regulatory agencies (i.e., obtaining permits for Off-Site activities or rights-of-way for construction activities);
- Availability of services and materials/supplies;
- Availability of adequate Off-Site treatment, storage capacity and disposal services;
- Availability of necessary equipment, specialists and provisions to ensure any necessary resources;

- Timing of the availability of each technology; and
- Availability of services and materials, and the potential for obtaining competitive bids, especially for innovative technologies.

Implementing remedial alternatives involves design, planning, construction or installation, and operation of the various mechanical and human components of remedial actions. The efficiency with which an alternative can be installed and operated impacts how well an alternative achieves its level of protection (the first threshold criterion) and attains ARARs (the second threshold criterion). In some cases, implementation of the alternative could be technically difficult or impossible given Site-specific limitations. The No Action alternative is the simplest alternative to implement. The remaining active alternatives rely on construction activities to implement the remedy. None of the alternatives involve any new or unproven technologies.

Alternative S3 would be the most problematic from an implementability standpoint due to the amount of water that would need to be removed from the excavation. The water would then need to be treated or managed. In addition, the depth of the excavation near the roads and residential area adjacent to the Site would require engineering measures to protect their structural integrity. Time estimates for attainment of ARARs or remedial goals are highly subjective and dependent on Site-specific conditions, operation efficiency, initial and final concentrations, and many other parameters. The No Action alternative is the simplest and quickest to implement, but it takes the longest time to achieve remedial objectives. The implementation of the remedy components for all of the active remedial alternatives is expected to take no more than six to twelve months for any of the alternatives. Once isolated, the RAOs for containment are considered met.

2.10.7 Cost

For each remedial alternative, a minus 30 to plus 50 percent cost estimate has been developed. Cost estimates for each remedial alternative are based on conceptual engineering and design and are expressed in 2009 dollars. The cost estimate for each remedial alternative consists of the following three general categories:

Capital Costs. These costs include the expenditures that are required for construction of the remedial alternative (direct costs) and non-construction/overhead costs (indirect costs). Capital costs are exclusive of the costs required to operate and maintain the remedial alternative throughout its use. Direct costs include the labor, equipment, and supply costs, including contractor markups for overhead and profit, associated with activities such as mobilization, monitoring, Site work, installation of treatment systems, and disposal costs. Indirect costs include items required to support the construction activities, but are not directly associated with a specific item.

Present Worth O&M Costs. These costs include the post-construction cost items required to ensure or verify the continued effectiveness of the remedial alternative. O&M costs typically include long-term power and material costs (i.e., operational cost of a water treatment facility), equipment replacement/repair costs, and long-term monitoring costs (i.e., labor and laboratory costs), including contractor markups for overhead and profit. Present worth analysis is based on a 7.5% discount rate over a period of 30 years.

Total Present Worth Costs. This is the sum of the total construction costs and present worth O&M costs and forms the basis for comparison of the various remedial alternatives. Cost of alternatives ranked from most to least expensive, based on the comparative analysis provided in Tables 21 and 22, are: Alternative S3: $53,054,090, Alternative S2: $32,492,090, Alternative S4: $29,134,100, Alternative S5: $10,691,320, and Alternative S1: $93,850.

2.11 Principal Threat Wastes

The NCP establishes an expectation that EPA will address the principal threats posed by a Site through treatment wherever practicable (NCP §300.430(a)(1)(iii)(A)). Identifying principal threat waste combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile, which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The DNAPL observed at monitoring wells MW05S and MW07S, located within the source area, is considered a "principal threat waste". The areas where the DNAPL was recorded is within the foot print of the area to be treated with stabilization/solidification to the water table. In addition to the S/S treatment, a vertical barrier wall will be installed to prevent continued migration of contaminants from the shallow groundwater source area.

2.12 Selected Remedy

2.12.1 Rationale for the Selected Remedy

The Site-wide remedy selected for Camilla Wood will reduce the risks of exposure to contaminant concentrations exceeding the remedial goals in both soil and groundwater. This action represents the final remedy selected for the Site, and, as such, is compatible with the intended future use of the Site.

Based on the comparison of the nine critera summarized above for each of the alternatives, Region 4's selected remedy combines soil/shallow groundwater alternative S5, *In Situ* Stabilization/Solidification Source Containment, Monitored Natural Attenuation, and Storm Water Improvements, and groundwater alternative GW2, *In Situ* Chemical Oxidation (Figure 19).

The modifying criteria of state and community acceptance have been incorporated into the selected remedy. The State of Georgia, as represented by the GAEPD, has been the support agency during the RI/FS process for the Site. In accordance with 40 CFR §300.430, as the support agency, GAEPD has provided input during the process. The community has participated in review of the Proposed Plan, and, based on the comments received, supports the selected remedy.

2.12.2 Description of the Selected Remedy

The selected remedy encompasses aggressive treatment of areas of surface and subsurface soil that act as a source for continued contamination of the aquifer. This approach uses stabilization/solidification of contaminated soils in the source area to the water table. Stabilization/solidification will also be used to treat the top 2 feet of contaminated soils with concentrations exceeding the Site cleanup levels outside of the source area. To prevent or reduce continued migration of contaminated groundwater from the shallow zone to the intermediate zone, karst features previously and yet to be identified which are found to be sources of migration from the shallow to the intermediate zone will be sealed using compression or jet grouting. In order to prevent continued migration of contaminants from the highly contaminated shallow groundwater source area, a vertical barrier wall will be installed around the perimeter of the source area. Treatment of the source and high concentration areas will continue via injection of a chemical oxidant, to treat the dissolved phase contamination in the intermediate aquifer.

The major components of the selected remedy include:

- *In situ* stabilization/solidification of contaminated soils in the source area.
- *In situ* stabilization/solidification of the top two feet of contaminated soils outside of the highly contaminated source area.
- Karst features which are found to be sources of migration from the shallow to the intermediate zone will be sealed using compression or jet grouting.
- Install a vertical barrier wall around the perimeter of the source area.
- Monitored natural attenuation of the areas in the surficial aquifer that are located outside of the vertical barrier wall.
- Implement storm water improvements.
- *In situ* chemical oxidation with bioaugmentation within the contaminant plume to treat the dissolved phase contamination in the intermediate aquifer.
- Institutional controls through a restrictive covenant to limit future land use to other than residential uses; prohibit potable groundwater use on the property; prohibit soil removal or digging within the boundary of the treated material.
- Establish and implement a long-term monitoring program to assess the effectiveness of the remedial action.

2.12.3 Institutional Controls

Institutional Controls 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 Institutional Controls 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. As part of an August 7, 2008, EPA Study entitled "Research on State and Local Laws and Related Issues to Assist in Consideration of Institutional Controls at the Camilla Wood Preserving Company Superfund Site", specific institutional controls and their implementation in conformance with State of Georgia, Mitchell County and Camilla laws and ordinances were identified that will support the remedy in ensuring protection of human health and the environment. Some of the controls which are available during the remedial design/remedial action include the following:

1. Prohibition on residential uses of Site property.
2. Restrictive covenants would prohibit potable groundwater use on the Camilla Wood Treatment property.

3. Groundwater use ordinances would mandate restrictions on groundwater extraction for potable use.
4. Soil removal or digging is prohibited within the boundary of the treated material disposal area on the Camilla Wood Treatment property.
5. No excavation on the Camilla Wood Treatment property shall occur without written approval from EPA.

2.12.4 Five-Year Reviews

A statutory review of the ongoing protectiveness of the on-Site remedy will be performed by EPA no less often than every five years after initiation of the remedial action. This review is a public process, and will be conducted to ensure that the on-Site remedy selected for this Site remains protective of human health and the environment.

2.12.5 Summary of Estimated Remedy Costs

The estimated present worth (7.5% discount rate) capital costs for remedy construction (combination of alternatives S5 and GW2) is approximately $13,620,280 million and is summarized in Tables 26 and 27. The present worth cost estimate for 30 years of O&M is approximately $302,420 and is presented in Tables 26 and 27. Additional changes in the cost estimate are likely to occur as new information and data are collected during the engineering design of the remedial alternatives. Major changes, if they occur, may be documented in the form of a memorandum in the Administrative Record file, an explanation of significant differences (ESD), or a ROD Amendment. This is an order of magnitude cost estimate that is expected to be within a margin of plus 50 percent to minus 30 percent of the actual project costs.

2.12.6 Available Land Use

During remedy construction, engineering and administrative controls will be used to protect the public from environmental exposure or safety hazards associated with the cleanup activities. Following remedy construction, the planned reuse of the Site is recreational.

2.12.7 Final Cleanup Levels

The cleanup levels noted in Table 20 were derived from analysis described in more detail in the HHRA and meet the current federal regulatory drinking water standards or maximum contaminant levels (MCLs). The cleanup levels also consider Site-specific cleanup levels based on reaching concentrations of contaminants corresponding to a Site-specific Hazard Quotient (HQ) of less than 1 and a Site-specific cumulative excess lifetime cancer risk more protective than 1×10^{-5}, or one in one hundred thousand. The final remedial cleanup levels for concentrations of COCs in soil and groundwater are included in Tables 18, 19, and 20.

2.13 Statutory Determinations

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

2.13.1 Protection of Human Health and the Environment

Successful implementation of this alternative would reduce risks to acceptable levels to human health and the environment and meet the RAOs by (1) eliminating exposure of recreational users to waste material by direct contact and airborne migration, (2) eliminating migration of contaminants from soil to shallow groundwater, and (3) eliminating the migration of contaminants from shallow groundwater to intermediate groundwater. The threat of direct human exposure to contaminated waste and physical hazards would be reduced by this alternative. The stabilization/solidification of the waste material would reduce contaminant exposure through the receptor routes of direct contact, ingestion, and inhalation. Contaminated soil would be treated and converted to meet the Site cleanup levels.

2.13.2 Compliance with ARARs

Implementation of the selected remedy will comply with all federal and state chemical-specific, action-specific, and location-specific ARARs.

Chemical-specific requirements include those laws and regulations governing the release of materials possessing certain chemical or physical characteristics, or containing specified chemical compounds. Chemical-specific requirements set health or risk based concentration limits or ranges in various environmental media for specific hazardous substances, contaminants, and pollutants. Additionally, federal and state air quality and storm water contaminant limits address specific contaminants during remedy construction. Table 23 presents the chemical-specific ARARs, to-be-considered (TBCs) guidance, and criteria for the Selected Remedy.

Action-specific requirements are technology-based, establishing performance, design, or other similar action-specific controls or regulations for the activities related to the management of hazardous substances or pollutants. Action-specific requirements are triggered by the particular remedial action selected to accomplish the cleanup. Action-specific requirements that will be complied with by the selected remedy primarily include federal and state hazardous waste regulations and discharge requirements. A summary of the requirements to be met through the implementation of the selected remedy is provided in Table 25.

Location-specific requirements are design requirements or activity restrictions based on the geographic or physical position of the Site and its surrounding area. Location-specific requirements set restrictions on the types of remedial activities that can be performed based on Site-specific characteristics or location. A summary of the requirements to be met through the implementation of the selected remedy is provided in Table 24.

2.13.3 Cost Effectiveness

EPA has determined that the selected remedy is cost-effective and that the overall protectiveness of the remedy is proportional to the overall cost of the remedy. The cost-effectiveness of the remedy was assessed by comparing the overall effectiveness of the remedy (i.e., long-term effectiveness and permanence; reduction in M/T/V; short-term effectiveness) with the other alternatives considered. More than one remedial alternative may be considered cost-effective, but CERCLA does not mandate that the most cost-effective or least expensive remedy be selected.

2.13.4 Permanent and Alternative Treatment solutions

The selected remedy uses permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy will provide long-term effectiveness and permanence. The remedy will require specific additional institutional and administrative controls over the short-term to remain effective, but these controls can be removed when cleanup levels are attained. The remedy can be reliably considered permanent.

2.13.5 Preference for Treatment as a Principal Element

In addition to the four statutory mandates previously discussed, the NCP includes a preference for treatment for the selected remedies in addressing the principal threat at the Site. The selected remedy meets the preference for treatment as a principal element. The selected remedy is primarily based on active treatment to address the M/T/V of the contaminated groundwater.

2.13.6 Five-Year Review Requirement

CERCLA Section 121 and 40 CFR Part 300 require a review of remedial actions at least every five years if the remedial action results in hazardous substances, pollutants, or contaminants remaining in place above levels that allow for unlimited use and unrestricted exposure. A statutory review of the remedial action is required within 5 years of the beginning of remedial construction.

2.14 Documentation of Significant Changes

Pursuant to CERCLA 117(b) and NCP 300.430(f)(3)(ii), the ROD must document any significant changes made to the Preferred Alternative discussed in the Proposed Plan. There have been no significant changes to the Preferred Alternative discussed in the Proposed Plan.

2.15 References

Black & Veatch, 2009. *Remedial Investigation/Feasibility Study for Camilla Wood Treatment (Escambia), August 2009.*

EPA, 1988. U.S. Environmental Protection Agency *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final, EPA/540/G-89/004*, October, 1988.

EPA, 1998a. U.S. Environmental Protection Agency, Memorandum from Timothy Fields, Jr., Acting Administrator, Office of Solid Waste and Emergency Response, Subject: "*Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites*," OSWER Directive 9200.4-26, April 13, 1998.

EPA. 2000b. Exposure and Human Health Reassessment of 2,3,7,8- tetrachlorodibenzo-p-dioxin and Related Compounds. National Center for Environmental Assessment, Office of Research and Development, Washington DC; EPA/600/P-00/001B(a-f).

Hayes, L.R., Maslia, M.L., and Meeks, W.C., 1983. Hydrology and model evaluation of the principal artesian aquifer, Dougherty Plain, southwest Georiga: Georgia Geologic Survey Bulletin 97, 1983.

Hicks, D.W., H.E. Gill, and S.A. Longsworth, 1987. Hydrogeology, chemical quality, and availability of groundwater in the Upper Floridan Aquifer, Albany Area, Georgia. USGS Water-Resources Investigations Report 87-4145, Atlanta.

Owen, V.J., 1963. Geology and Ground-water Resources of Lee and Sumter Counties in Southwest Georgia. USGS Open-File Report, 1963.

PART 3: RESPONSIVENESS SUMMARY

3.1 Overview and Summary

This Responsiveness Summary documents public comments and EPA responses to comments on the proposed plan for soil and groundwater remediation at the Camilla Wood Preserving Company Site in Camilla,Mitchell County, Georgia. EPA published the Public Notice for the Proposed Plan and Public Meeting in the *Camilla Enterprise* on August 12, 2009. EPA mailed a meeting notice and a Proposed Plan fact sheet to individuals and groups on the Camilla Wood site mailing list on August 10, 2009. EPA Region 4 held a public comment period from August 12 through September 10, 2009. EPA held a public meeting on August 20, 2009 to present the elements of the proposed remedy and receive oral public comments.

A verbatim transcript of the August 20, 2009, public meeting is provided in Appendix A. Appendix B contains comments transcribed verbatim from electronic and first class mail from the Georgia Environmental Protection Department

3.2 Written Public Comments

EPA received written comments from the Georgia Environmental Protection Division related to some aspects of the proposed plan. The comments primarily related to typographical errors in the proposed plan document. EPA has incorporated these comments into the proposed plan and Record of Decision document. One comment submitted stated that "pentachlorophenol (PCP) contamination in shallow groundwater outside of the "source area" slurry wall is not addressed in the proposed Record of Decision." EPA agrees that there is no explicit recognition in the proposed plan and Record of Decision of the remedial action that will be used to address PCP contamination that is above the remedial goals in shallow groundwater outside of the "source area" slurry wall. EPA is revising the proposed plan and Record of Decision document to state that PCP contamination above remedial goals in the shallow groundwater outside of the "source area" vertical barrier wall will be addressed through monitored natural attenuation. Shallow groundwater PCP data from the Site demonstrates that after four previous soil, surface water, and waste removal actions, the pentachlorophenol contaminant levels have decreased markedly over time. EPA believes that this reduction of source material in great part has lead to PCP contaminant reductions in the surficial aquifer. In addition, the shallow aquifer has the appropriate natural conditions in place so that natural processes already present will continue to aid in the reduction of pentachlorophenol contaminant concentrations. Finally, as part of the proposed remedial action, a vertical barrier wall will be installed in the surficial aquifer to physically isolate source material which has contributed to dissolved-phase PCP concentrations above remedial goals. As part of the remedial design and remedial action phases of the Site cleanup, EPA will routinely monitor PCP concentrations outside of the "source area" vertical barrier wall to ensure that PCP contaminant reductions take place until remedial goals are met.

3.3 Public Meeting Comments

EPA received oral comments from members of the public that reside in the neighborhood adjacent to the Site. The primary comments received concerned recent flooding that took place in the neighborhood. The City of Camilla had constructed a holding pond on its land south of the Site. As part of the anticipated remedial action, EPA will have to manage stormwater runoff from the Site due to a reduction in permeable area from solidification/stabilization of the source area in surface soils. EPA committed to discuss with the City of Camilla specific approaches to construct a separate stormwater retention basin or enlarge the City's current stormwater basin. EPA has since made contact with the City of Camilla and the stormwater retention pond construction consultant to discuss either enlarging the current stormwater retention basin or finding another on-Site location to construct additional capacity to address stormwater runoff.

Other comments received had to do with the safety of City of Camilla municipal water and off-Site soil contamination in relation to planting gardens and other landscaping projects. Based on the direction of groundwater flow and data obtained as a result of the remedial investigation, EPA does not believe that there is a threat to the City of Camilla's municipal wells. In addition, after previous soil removal actions in the off-Site neighborhood, there are no areas where soil contamination exceeds Site remedial goals. EPA is sending soil and groundwater data obtained from the remedial investigation as well as the City of Camilla's 2008 annual water quality report which shows that the City of Camilla's municipal drinking water is safe and contains no detections of Site-related contaminants.

TABLES

Table 1: Data Summary for Surface Soil
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Partially Wooded Area	Benzo(a)anthracene*	1.9J	3900	ug/kg	4/4	--	--	--
	Benzo(a)pyrene*	1.7J	7400	ug/kg	4/4	--	--	--
	Benzo(b)fluoranthene*	5.4	5.4	ug/kg	1/1	--	--	--
	Benzo(k)fluoranthene*	7700J	12000J	ug/kg	3/3	--	--	--
	Chrysene*	4.9	9400	ug/kg	4/4	--	--	--
	Indeno(1,2,3-cd)pyrene*	2.3J	4600	ug/kg	4/4	--	--	--
	CPAHs	--	--	--	--	10900	ug/kg	Max
	2,3,7,8-TCDD TEQ (Dioxin)	310J	11000J	ng/kg	4/4	11	ug/kg	Max
Car Repair Shop	Pentachlorophenol	100J	4900000J	ug/kg	6/7	4900000	ug/kg	Max
Former Pressure Vessel Area	Benzo(a)anthracene*	115J	9500	ug/kg	6/6	--	--	--
	Benzo(a)pyrene*	190J	12000	ug/kg	6/6	--	--	--
	Benzo(b)fluoranthene*	360J	480	ug/kg	2/2	--	--	--
	Benzo(k)fluoranthene*	4000J	28000J	ug/kg	4/4	--	--	--
	Chrysene*	200J	12000	ug/kg	6/6	--	--	--
	Indeno(1,2,3-cd)pyrene*	210J	8900	ug/kg	6/6	--	--	--
	CPAHs	--	--	--	--	20152	ug/kg	Max
	Pentachlorophenol	96J	130000J	ug/kg	6/6	130000	ug/kg	Max
	2,3,7,8-TCDD TEQ (Dioxin)	290J	9900J	ng/kg	2/2	9.9	ug/kg	Max
Commercial /Residential Area	Benzo(a)anthracene*	43J	6800000J	ug/kg	5/6	--	--	--
	Benzo(a)pyrene*	71J	180000J	ug/kg	5/6	--	--	--
	Benzo(b)fluoranthene*	1600	290000J	ug/kg	2/3	--	--	--
	Benzo(k)fluoranthene*	4400	290000J	ug/kg	2/3	--	--	--
	Chrysene*	89J	710000J	ug/kg	5/6	--	--	--
	Indeno(1,2,3-cd)pyrene*	88J	61000J	ug/kg	5/6	--	--	--
	CPAHs	--	--	--	--	237710	ug/kg	Max
	Dibenzofuran	420J	490000J	ug/kg	4/6	490000	ug/kg	Max
	Pentachlorophenol	88J	770000J	ug/kg	5/6	770000	ug/kg	Max

Table 1: Data Summary for Surface Soil
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Main Operations Area	Benzo(a)anthracene*	0.7J	27000J	ug/kg	46/48	--	--	--
	Benzo(a)pyrene*	1.8J	11000J	ug/kg	46/48	--	--	--
	Benzo(b)fluoranthene*	3.5J	47000	ug/kg	8/8	--	--	--
	Benzo(k)fluoranthene*	1.5J	38000J	ug/kg	7/8	--	--	--
	Chrysene*	2.5J	47000	ug/kg	47/48	--	--	--
	Indeno(1,2,3-cd)pyrene*	2.5J	14000J	ug/kg	45/48	--	--	--
	CPAHs	--	--	--	--	3194	ug/kg	95% UCL
	Pentachlorophenol	1J	67000J	ug/kg	40/48	32550	ug/kg	95% UCL

Key

µg/kg: micrograms per kilogram
ng/kg: nanograms per kilogram
Max: Maximum Detected Value
UCL: Upper Confidence Limit
J: Estimated value
JN: Presumptive evidence of presence of the analyte; the associated numerical value is the approximate concentration of the analyte in the sample.

* As an interim procedure, Region 4 has adopted a methodology for carcinogenic polycyclic aromatic hydrocarbons (CPAHs). The toxic equivalence factors (TEFs) are based on the relative potency of each compound relative to that of benzo(a)pyrene (BaP). The following TEFs were used to convert each CPAH to an equivalent concentration of BaP: benzo(a)pyrene 1.0, benzo(a)anthracene 0.1, benzo(b)fluoranthene 0.1, benzo(k)fluoranthene 0.01, indeno(1,2,3-cd)pyrene 0.1, and chrysene 0.001.

Table 2: Data Summary for Subsurface Soil
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Partially Wooded Area	Benzo(a)anthracene*	120J	580	ug/kg	3/3	--	--	--
	Benzo(a)pyrene*	300J	1500	ug/kg	3/3	--	--	--
	Benzo(b)fluoranthene*	420J	4400J	ug/kg	3/3	--	--	--
	Benzo(k)fluoranthene*	420J	4400J	ug/kg	3/3	--	--	--
	Chrysene*	220J	1400	ug/kg	3/3	--	--	--
	Indeno(1,2,3-cd)pyrene*	230J	4200	ug/kg	3/3	--	--	--
	CPAHs	--	--	--	--	3340	ug/kg	Max
Former Vessel Area	2-Methylnaphthalene	76J	1300000J	ug/kg	3/5	1300000	ug/kg	Max
Main Operations Ares	Benzo(a)anthracene*	35J	260000	ug/kg	24/36	--	--	--
	Benzo(a)pyrene*	39J	73000J	ug/kg	25/36	--	--	--
	Benzo(b)fluoranthene*	37J	230000J	ug/kg	30/36	--	--	--
	Benzo(k)fluoranthene*	640JN	640JN	ug/kg	1/36	--	--	--
	Chrysene*	42J	270000	ug/kg	24/36	--	--	--
	Indeno(1,2,3-cd)pyrene*	45J	30000J	ug/kg	24/36	--	--	--
	CPAHs	--	--	--	--	72207	ug/kg	95% UCL
	Pentachlorophenol	79J	230000J	ug/kg	22/36	113305	ug/kg	95% UCL

Key

Max: Maximum Detected Value
UCL: Upper Confidence Limit
J: Estimated value
JN: Presumptive evidence of presence of the analyte; the associated numerical value is the approximate concentration of the analyte in the sample.

* As an interim procedure, Region 4 has adopted a methodology for carcinogenic polycyclic aromatic hydrocarbons (CPAHs). The toxic equivalence factors (TEFs) are based on the relative potency of each compound relative to that of benzo(a)pyrene (BaP). The following TEFs were used to convert each CPAH to an equivalent concentration of BaP: benzo(a)pyrene 1.0, benzo(a)anthracene 0.1, benzo(b)fluoranthene 0.1, benzo(k)fluoranthene 0.01, indeno(1,2,3-cd)pyrene 0.1, and chrysene 0.001.

Table 3: Ground Water
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Ground Water
Exposure Medium: Ground Water

Exposure Points	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Shallow	Benzo(a)anthracene*	0.15J	0.9J	ug/L	4/9	--	--	--
	Benzo(a)pyrene*	0.14J	0.14J	ug/L	1/9	--	--	--
	Benzo(b)fluoranthene*	0.15J	0.15J	ug/L	1/8	--	--	--
	Benzo(k)fluoranthene*	0.14J	0.14J	ug/L	1/8	--	--	--
	Chrysene*	0.055J	1.3J	ug/L	5/9	--	--	--
	Indeno(1,2,3-cd)pyrene*	--	--	--	--	--	--	--
	CPAHs	--	--	--	--	2.48E-01	ug/L	MAX
	Benzene	3.4J	3.4J	ug/L	1/9	3.40E+00	ug/L	MAX
	2,4-Dimethylphenol	4.3J	140J	ug/L	3/9	5.34E+01	ug/L	AVG
	2-Methylphenol	4.1J	280J	ug/L	3/9	2.80E+02	ug/L	MAX
	Carbazole	6.4	750J	ug/L	6/9	2.30E+02	ug/L	AVG
	Dibenzofuran	8.5	190J	ug/L	6/9	1.00E+02	ug/L	AVG
	Naphthalene	0.266J	3700J	ug/L	9/9	1.45E+03	ug/L	AVG
	Pentachlorophenol	0.085J	300J	ug/L	9/9	1.19E+02	ug/L	AVG
	Phenanthrene	0.75	200J	ug/L	8/9	9.00E+01	ug/L	AVG
	Arsenic	9.35J	13	ug/L	2/9	1.30E+01	ug/L	MAX
	Manganese	4.6J	1300	ug/L	9/9	8.35E+02	ug/L	AVG
Intermediate	Benzo(a)anthracene*	0.082J	1.2J	ug/L	7/28	--	--	--
	Benzo(a)pyrene*	0.34J	0.34J	ug/L	1/28	--	--	--
	Benzo(b)fluoranthene*	0.055J	0.3J	ug/L	4/27	--	--	--
	Benzo(k)fluoranthene*	0.056J	0.29J	ug/L	3/27	--	--	--
	Chrysene*	0.053J	0.94J	ug/L	11/28	--	--	--
	Indeno(1,2,3-cd)pyrene*	0.057J	0.12J	ug/L	3/28	--	--	--
	CPAHs	--	--	--	--	5.88E-01	ug/L	MAX
	Benzene	0.4J	49J	ug/L	3/28	4.90E+01	ug/L	MAX
	Ethylbenzene	4.8J	40	ug/L	2/27	4.00E+01	ug/L	MAX
	Acenaphthene	0.05J	490	ug/L	14/28	2.12E+02	ug/L	AVG

Table 3: Ground Water
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Ground Water
Exposure Medium: Ground Water

Exposure Points	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Intermediate (Continued)	Carbazole	2.05J	360	ug/L	7/28	1.38E+02	ug/L	AVG
	Dibenzofuran	0.81J	340	ug/L	11/28	1.66E+02	ug/L	AVG
	Fluorene	0.053J	290	ug/L	16/28	1.28E+02	ug/L	AVG
	Naphthalene	0.11	13000	ug/L	26/28	3.84E+03	ug/L	AVG
	Pentachlorophenol	0.08J	690J	ug/L	17/28	2.79E+02	ug/L	AVG
	Phenanthrene	0.055J	240	ug/L	22/28	1.06E+02	ug/L	AVG
	Heptachlor Epoxide	0.17N	0.17N	ug/L	1/28	1.70E-01	ug/L	AVG
	Arsenic	3.5J	23	ug/L	12/27	1.50E+01	ug/L	AVG
	Manganese	1.5J	2700	ug/L	26/27	1.12E+03	ug/L	AVG
	Nickel	1.1J	360	ug/L	18/27	8.85E+01	ug/L	AVG

Key

J: Estimated value
Max: Maximum detected value
Avg: Average
N: Presumptive evidence of presence of the analyte in the sample.
µg/L: Micrograms per liter

* As an interim procedure, Region 4 has adopted a methodology for carcinogenic polycyclic aromatic hydrocarbons (CPAHs). The toxic equivalence factors (TEFs) are based on the relative potency of each compound relative to that of benzo(a)pyrene (BaP). The following TEFs were used to convert each CPAH to an equivalent concentration of BaP: benzo(a)pyrene 1.0, benzo(a)anthracene 0.1, benzo(b)fluoranthene 0.1, benzo(k)fluoranthene 0.01, indeno(1,2,3-cd)pyrene 0.1, and chrysene 0.001.

Table 4: Cancer Toxicity Data Summary -- Oral and Dermal

Chemical of Potential Concern	Oral Cancer Slope Factor		Dermal Cancer Slope Factor(1)		Weight of Evidence/ Cancer Guideline Description	Source/Date	
	Value	Units	Value	Units		Source(s)	Date(s) (2)
Benzene	5.5E-02	$(mg/kg/day)^{-1}$	5.5E-02	$(mg/kg/day)^{-1}$	A	IRIS	05/12/2009
Ethylbenzene	1.1E-02	$(mg/kg/day)^{-1}$	1.1E-02	$(mg/kg/day)^{-1}$	B2	CalEPA	05/12/2009
2,4-Dimethylphenol	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	NA	NA	NA
2-Methylnaphthalene	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	NA	NA	NA
Acenaphthene	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	NA	NA	NA
cPAHs B(a)P TEQ	7.3E+00	$(mg/kg/day)^{-1}$	7.3E+00	$(mg/kg/day)^{-1}$	B2	IRIS	05/12/2009
Carbazole	2.0E-02	$(mg/kg/day)^{-1}$	2.0E-02	$(mg/kg/day)^{-1}$	B2	HEAST	Jul-97
Dibenzofuran	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	D	IRIS	05/12/2009
Fluorene	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	D	IRIS	05/12/2009
Naphthalene	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	C	IRIS	05/12/2009
Pentachlorophenol	1.2E-01	$(mg/kg/day)^{-1}$	1.2E-01	$(mg/kg/day)^{-1}$	B2	IRIS	05/12/2009
Phenanthrene	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	D	IRIS	05/12/2009
Heptachlor epoxide	9.1E+00	$(mg/kg/day)^{-1}$	9.1E+00	$(mg/kg/day)^{-1}$	B2	IRIS	05/12/2009
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E+05	$(mg/kg/day)^{-1}$	2B	CalEPA	05/12/2009
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	05/12/2009
Manganese (water)	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	D	IRIS	05/12/2009
Nickel	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	NA	NA	NA

CalEPA = California EPA
CSF = Cancer slope factor
HEAST = Health Effects Assessment Summary Tables; July 1997
IRIS = Integrated Risk Information System
NA = Not Applicable
mg/kg-day = milligrams per kilogram per day

(1) *The dermal CSF was assumed to equal the oral CSF, unless an adjustment factor was found in Exhibit* 4.1 of RAGS-E (EPA 2004).
(2) IRIS values were confirmed against the EPA's online database, May 2009

EPA Weight of Evidence:
A - Human Carcinogen
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.
C - Possible human carcinogen
D - Not classifiable as human carcinogen
NA - Not Applicable

Table 5: Cancer Toxicity Data Summary -- Inhalation

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk	
	Value	Units		Source(s)	Date(s) (1)
Benzene	7.8E-06	$(ug/m^3)^{-1}$	A	IRIS	05/12/2009
Ethylbenzene	2.5E-06	$(ug/m^3)^{-1}$	B2	CalEPA	05/12/2009
2,4-Dimethylphenol	NA	$(ug/m^3)^{-1}$	NA	NA	NA
2-Methylnaphthalene	NA	$(ug/m^3)^{-1}$	NA	NA	NA
Acenaphthene	NA	$(ug/m^3)^{-1}$	NA	NA	NA
cPAHs B(a)P TEQ	1.1E-03	$(ug/m^3)^{-1}$	B2	CalEPA	05/12/2009
Bis(2-ethylhexyl)phthalate	2.4E-06	$(ug/m^3)^{-1}$	B2	CalEPA	05/12/2009
Carbazole	NA	$(ug/m^3)^{-1}$	NA	NA	NA
Dibenzofuran	NA	$(ug/m^3)^{-1}$	D	IRIS	05/12/2009
Fluorene	NA	$(ug/m^3)^{-1}$	D	IRIS	05/12/2009
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	C	CalEPA	05/12/2009
Pentachlorophenol	4.6E-06	$(ug/m^3)^{-1}$	B2	CalEPA	05/12/2009
Phenanthrene	NA	$(ug/m^3)^{-1}$	D	IRIS	05/12/2009
Heptachlor epoxide	2.6E-03	$(ug/m^3)^{-1}$	B2	IRIS	05/12/2009
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	3.8E+01	$(ug/m^3)^{-1}$	2B	CalEPA	05/12/2009
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	A	IRIS	05/12/2009
Manganese (water)	NA	$(ug/m^3)^{-1}$	D	IRIS	05/12/2009
Nickel	2.6E-04	$(ug/m^3)^{-1}$	A	CalEPA	05/12/2009

CalEPA = California EPA

IRIS = Integrated Risk Information System

NA = Not Applicable

$\mu g/m^3$ = micrograms per cubic meter

(1) IRIS values were confirmed against the EPA's online database, May 2009.

EPA Weight of Evidence:

A - Human Carcinogen

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.

C - Possible human carcinogen

D - Not classifiable as human carcinogen

Table 6: Non-Cancer Toxicity Data Summary - Oral and Dermal

Chemical of Potential Concern (1)	Chronic/ Subchronic	Oral RfD		Dermal RfD (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (3) (MM/DD/YYYY)
Benzene	Chronic	4.0E-03	mg/kg-day	4.0E-03	mg/kg-day	Blood	300	IRIS	05/11/2009
Benzene	Subchronic	NA	mg/kg-day	NA	mg/kg-day	NA	NA	NA	NA
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	1.0E-01	mg/kg-day	Liver/Kidney	1000	IRIS	05/11/2009
Ethylbenzene	Subchronic	5.0E-01	mg/kg-day	5.0E-01	mg/kg-day	Kidney	100	ATSDR-MRL	05/11/2009
2,4-Dimethylphenol	Chronic	2.0E-02	mg/kg-day	2.0E-02	mg/kg-day	CNS/Blood	3000	IRIS	05/11/2009
2,4-Dimethylphenol	Subchronic	5.0E-02	mg/kg-day	5.0E-02	mg/kg-day	CNS/Blood	1000	PPRTV	05/18/2009
2-Methylnaphthalene	Chronic	4.0E-03	mg/kg-day	4.0E-03	mg/kg-day	Respiratory	1000	IRIS	05/11/2009
2-Methylnaphthalene	Subchronic	4.0E-03	mg/kg-day	4.0E-03	mg/kg-day	Respiratory	1000	PPRTV	05/18/2009
Acenaphthene	Chronic	6.0E-02	mg/kg-day	6.0E-02	mg/kg-day	Liver	3000	IRIS	05/11/2009
Acenaphthene	Subchronic	6.0E-01	mg/kg-day	6.0E-01	mg/kg-day	Liver	300	HEAST	Jul-97
cPAHs B(a)P TEQ	Chronic	NA	mg/kg-day	NA	mg/kg-day	NA	NA	IRIS	05/11/2009
cPAHs B(a)P TEQ	Subchronic	NA	mg/kg-day	NA	mg/kg-day	NA	NA	NA	NA
Carbazole	Chronic	NA	mg/kg-day	NA	mg/kg-day	NA	NA	NA	NA
Carbazole	Subchronic	NA	mg/kg-day	NA	mg/kg-day	NA	NA	NA	NA
Dibenzofuran	Chronic	2.0E-03	mg/kg-day	2.0E-03	mg/kg-day	Kidney	10000	PPRTV	05/11/2009
Dibenzofuran	Subchronic	4.0E-03	mg/kg-day	4.0E-03	mg/kg-day	Organ Length & Weight/Abdominal Fat	3000	PPRTV	05/11/2009
Fluorene	Chronic	4.0E-02	mg/kg-day	4.0E-02	mg/kg-day	Blood	3000	IRIS	05/12/2009
Fluorene	Subchronic	4.0E-01	mg/kg-day	4.0E-01	mg/kg-day	Blood	300	HEAST	Jul-97
Naphthalene	Chronic	2.0E-02	mg/kg-day	2.0E-02	mg/kg-day	Body Weight	3000	IRIS	05/12/2009
Naphthalene	Subchronic	6.0E-01	mg/kg-day	6.0E-01	mg/kg-day	CNS	90	ATSDR-MRL	05/12/2009
Pentachlorophenol	Chronic	3.0E-02	mg/kg-day	3.0E-02	mg/kg-day	Liver/Kidney	100	IRIS	05/12/2009
Pentachlorophenol	Subchronic	3.0E-02	mg/kg-day	3.0E-02	mg/kg-day	Developmental	100	HEAST	Jul-97
Phenanthrene	Chronic	3.0E-02	mg/kg-day	3.0E-02	mg/kg-day	Kidney	3000	Pyrene-Surrogate	-
Phenanthrene	Subchronic	3.0E-01	mg/kg-day	3.0E-01	mg/kg-day	Kidney	300	Pyrene-Surrogate	-
Heptachlor epoxide	Chronic	1.3E-05	mg/kg-day	1.3E-05	mg/kg-day	Liver	1000	IRIS	05/12/2009
Heptachlor epoxide	Subchronic	1.3E-05	mg/kg-day	1.3E-05	mg/kg-day	Liver	1000	HEAST	Jul-97
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	Chronic	1.0E-09	mg/kg-day	1.0E-09	mg/kg-day	Developmental	90	ATSDR-MRL	05/12/2009
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	Subchronic	2.0E-08	mg/kg-day	2.0E-08	mg/kg-day	Thymus	30	ATSDR-MRL	05/12/2009
Arsenic	Chronic	3.0E-04	mg/kg-day	3.0E-04	mg/kg-day	Skin/Vascular	3	IRIS	05/12/2009
Arsenic	Subchronic	3.0E-04	mg/kg-day	3.0E-04	mg/kg-day	Skin/Vascular	3	HEAST	Jul-97
Manganese (water)	Chronic	2.4E-02	mg/kg-day	9.60E-04	mg/kg-day	CNS	1	IRIS	05/12/2009
Manganese (water)	Subchronic	2.4E-02	mg/kg-day	9.60E-04	mg/kg-day	CNS	1	HEAST	Jul-97
Nickel	Chronic	2.0E-02	mg/kg-day	8.0E-04	mg/kg-day	Organ Weight/Body Weight	300	IRIS	05/12/2009
Nickel	Subchronic	2.0E-02	mg/kg-day	8.0E-04	mg/kg-day	Organ Weight/Body Weight	300	HEAST	Jul-97

ATSDR-MRL = Agency for Toxic Substances and Disease Registry Minimal Risk Level
CNS = Central Nervous System
HEAST = Health Effects Assessment Summary Tables; July 1997
IRIS = Integrated Risk Information System
NA = Not Applicable
PPRTV = Provisional Peer Reviewed Toxicity Values
RfD = Reference dose
mg/kg-day = milligrams per kilogram per day

(1) Toxictiy values shown include chemicals of potential concern (COPCs) in surface soil, subsurface soil, and Ground Water .
(2) The dermal RfD was assumed to equal the oral RfD, unless an adjustment factor was found in Exhibit 4.1 of RAGS-E (EPA 2004).
(3) IRIS values were confirmed against the EPA's online database, May 2009.

Table 7: Non-Cancer Toxicity Data Summary -- Inhalation

Chemical of Potential Concern (1)	Chronic/ Subchronic	Inhalation		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfC Target Organ(s)	
		Value	Units			Source(s)	Date(s) (2) (MM/DD/YYYY)
Benzene	Chronic	3.0E-02	mg/m^3	Blood	300	IRIS	05/11/2009
Benzene	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Chlorobenzene	Chronic	5.0E-02	mg/m^3	Liver/Kidney	1000	PPRTV	05/11/2009
Chlorobenzene	Subchronic	5.0E-01	mg/m^3	Liver/Kidney	100	PPRTV	05/11/2009
Ethylbenzene	Chronic	1.0E+00	mg/m^3	Developmental	300	IRIS	05/11/2009
Ethylbenzene	Subchronic	3.0E+00	mg/m^3	CNS	300	ATSDR-MRL	05/11/2009
2,4-Dimethylphenol	Chronic	NA	mg/m^3	NA	NA	IRIS	05/11/2009
2,4-Dimethylphenol	Subchronic	NA	mg/m^3	NA	NA	NA	NA
2-Methylnaphthalene	Chronic	NA	mg/m^3	NA	NA	IRIS	05/11/2009
2-Methylnaphthalene	Subchronic	NA	mg/m^3	NA	NA	NA	NA
2-Methylphenol	Chronic	NA	mg/m^3	NA	NA	IRIS	05/11/2009
2-Methylphenol	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Acenaphthene	Chronic	NA	mg/m^3	NA	NA	IRIS	05/11/2009
Acenaphthene	Subchronic	NA	mg/m^3	NA	NA	NA	NA
cPAHs B(a)P TEQ	Chronic	NA	mg/m^3	NA	NA	IRIS	05/11/2009
cPAHs B(a)P TEQ	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Carbazole	Chronic	NA	mg/m^3	NA	NA	NA	NA
Carbazole	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Dibenzofuran	Chronic	NA	mg/m^3	NA	NA	NA	NA
Dibenzofuran	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Fluorene	Chronic	NA	mg/m^3	NA	NA	NA	NA
Fluorene	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Naphthalene	Chronic	3.0E-03	mg/m^3	Respiratory System	3000	IRIS	05/12/2009
Naphthalene	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Pentachlorophenol	Chronic	NA	mg/m^3	NA	NA	NA	NA
Pentachlorophenol	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Phenanthrene	Chronic	NA	mg/m^3	NA	NA	NA	NA
Phenanthrene	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Heptachlor epoxide	Chronic	NA	mg/m^3	NA	NA	NA	NA
Heptachlor epoxide	Subchronic	NA	mg/m^3	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	Chronic	4.0E-08	mg/m^3	Liver, lymph, respiratory, vascular	100	CalEPA	05/12/2009
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Arsenic	Chronic	3.0E-05	mg/m^3	Developmental	1000	CalEPA	05/12/2009
Arsenic	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m^3	CNS	1000	IRIS	05/12/2009
Manganese	Subchronic	NA	mg/m^3	NA	NA	NA	NA
Nickel	Chronic	9.0E-05	mg/m^3	Respiratory System	30	ATSDR-MRL	05/12/2009
Nickel	Subchronic	2.0E-03	mg/m^3	Respiratory System	30	ATSDR-MRL	05/12/2009

ATSDR-MRL = Agency for Toxic Substances and Disease Registry Minimal Risk Level
CalEPA = California EPA
CNS = Central Nervous System
NA = Not Applicable
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer Reviewed Toxicity Values
RfC = Reference concentration
mg/m^3 = milligrams per cubic met

(1) Toxicity values shown include chemicals of potential concern (COPCs) in surface soil, subsurface soil, and Ground Water.
(2) IRIS values were confirmed against the EPA's online database, May 2009.

Table 8: Risk Characterization Summary for Recreational Child - Carcinogens							
Scenario Timeframe: Future **Receptor Population: Recreational** **Receptor Age: Child**							
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Carcinogenic Risks**			
				Ingestion	**Inhalation**	**Dermal**	**Exposure Routes Total**
Surface Soil	Surface Soil	Partially Wooded Area	cPAH B(a)P TEQ	1.3E-05	NA	2.4E-05	3.7E-05
			Dioxin	--	--	--	--
		Partially Wooded Area Risk Total =					4E-05
		Car Repair Shop Area	Pentachlorophenol	9.6E-05	NA	3.4E-04	4.3E-04
		Car Repair Shop Risk Total =					4E-04
		Former Pressure Vessel Area	cPAH B(a)P TEQ	2.4E-05	NA	4.4E-05	6.8E-05
			Pentachlorophenol	2.5E-06	NA	8.9E-06	1.1E-05
			Dioxin	--	--	--	--
			Former Pressure Vessel Area Risk Total =				8E-05
		Main Operations Area	cPAH B(a)P TEQ	3.8E-06	NA	6.9E-06	1.1E-05
			Pentachlorophenol	6.4E-07	NA	2.2E-06	2.9E-06
			Main Operations Area Risk Total =				1E-05
		Commercial/Residential Area	cPAH B(a)P TEQ	2.8E-04	NA	5.1E-04	8.0E-04
			Pentachlorophenol	1.5E-05	NA	5.3E-05	6.8E-05
Commercial/Residential Area Soil Risk Total =							9E-04
Total Risk=							1E-03

Key

- :Dioxin evaluated in accordance with EPA OSWER Directive (EPA, 1998)

NA :Not Applicable

Table 9: Risk Characterization Summary for Recreational Adult – Carcinogens

Scenario Timeframe: Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risks			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Partially Wooded Area	cPAH B(a)P TEQ	5.6E-06	NA	4.1E-05	4.7E-05
			Dioxin	--	--	--	--
						Partially Wooded Area Risk Total =	5E-05
		Car Repair Shop Area	Pentachlorophenol	4.1E-05	NA	5.8E-04	6.3E-04
						Car Repair Shop Area Risk Total =	6E-04
		Former Pressure Vessel Area	cPAH B(a)P TEQ	1.0E-05	NA	7.6E-05	8.6E-05
			Pentachlorophenol	1.1E-06	NA	1.6E-05	1.7E-05
			Dioxin	--	--	--	--
						Former Pressure Vessel Area Risk Total =	1E-04
		Main Operations Area	cPAH B(a)P TEQ	1.6E-06	NA	1.2E-05	1.4E-05
			Pentachlorophenol	2.7E-07	NA	3.9E-06	4.2E-06
						Main Operations Area Risk Total =	2E-05
		Commercial/ Residential Area	cPAH B(a)P TEQ	1.2E-04	NA	9.0E-04	1.0E-03
			Pentachlorophenol	6.4E-06	NA	9.2E-05	9.8E-05
						Commercial/Residential Area Risk Total =	1E-03
						Total Risk=	2E-03

Key

- : Dioxin evaluated in accordance with EPA OSWER Directive (EPA, 1998)
NA :Not Applicable

Table 10: Risk Characterization Summary for the Construction/Recreational Worker – Carcinogens							
Scenario Timeframe: Future **Receptor Population: Recreational** **Receptor Age: Construction/Excavation Worker**							
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Carcinogenic Risks**			
				Ingestion	**Inhalation**	**Dermal**	**Exposure Routes Total**
Subsurface Soil	Subsurface Soil	Partially Wooded Area	cPAH B(a)P TEQ	1.1E-06	4.1E-09	2.2E-07	1.4E-06
		Partially Wooded Area Risk Total =					1E-06
		Former Pressure Vessel Area	cPAH B(a)P TEQ	2.6E-05	9.5E-08	5.2E-06	3.1E-05
		Former Pressure Vessel Area Risk Total =					3E-05
		Main Operations Area	cPAH B(a)P TEQ	2.4E-05	8.9E-08	4.8E-06	2.9E-05
			Pentachlorophenol	6.3E-07	5.8E-10	2.4E-07	8.7E-07
		Main Operations Area Risk Total =					3E-05
Total Risk=							6E-05

Table 11: Risk Characterization Summary for the Child Resident – Carcinogens							
Scenario Timeframe: Future **Receptor Population: Resident** **Receptor Age: Child**							
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Carcinogenic Risks**			
				Ingestion	**Inhalation**	**Dermal**	**Exposure Routes Total**
Ground Water	Ground Water	Shallow Ground Water	cPAH B(a)P TEQ	9.9E06	NA	NA	9.9E-06
			Benzene	1.0E-06	1.0E-06	NA	2.0E-06
			Carbazole	1.8E-05	NA	NA	1.8E-05
			Pentachlorophenol	7.8E-05	NA	NA	7.8E-05
			Arsenic	1.1E-04	NA	NA	1.1E-04
						Shallow Groundwater risk total=	2E-04
		Intermediate Ground Water	cPAH B(a)P TEQ	2.4E-05	NA	NA	2.4E-05
			Benzene	1.5E-05	1.5E-05	NA	3.0E-05
			Ethylbenzene	2.4E-06	2.4E-06	NA	4.8E-06
			Carbazole	1.5E-05	NA	NA	1.5E-05
			Heptachlor Epoxide	8.5E-06	NA	NA	8.5E-06
			Pentachlorophenol	1.8E-04	NA	NA	1.8E-04
			Arsenic	1.2E-04	NA	NA	1.2E-04
						Intermediate Groundwater risk total=	4E-04
						Total Risk=	6E-04

Key

NA: Not Applicable

Table 12: Risk Characterization Summary for the Adult Resident – Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risks			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground Water	Ground Water	Shallow Ground Water	cPAH B(a)P TEQ	1.7E-05	NA	NA	1.7E-05
			Benzene	1.8E-06	1.8E-06	NA	3.5E-06
			Carbazole	3.0E-05	NA	NA	3.0E-05
			Pentachlorophenol	1.3E-04	NA	NA	1.3E-04
			Arsenic	1.8E-04	NA	NA	1.8E-04
		Shallow Ground Water Risk Total=					4E-04
		Intermediate Ground Water	cPAH B(a)P TEQ	4.0E-05	NA	NA	4.0E-05
			Benzene	2.5E-05	2.5E-05	NA	5.1E-05
			Ethylbenzene	4.1E-06	4.1E-06	NA	8.3E-06
			Carbazole	2.6E-05	NA	NA	2.6E-05
			Heptachlor Epoxide	1.5E-05	NA	NA	1.5E-05
			Pentachlorophenol	3.1E-04	NA	NA	3.1E-04
			Arsenic	2.1E-04	NA	NA	2.1E-04
Intermediate Ground Water Risk Total=							7E-04
Total Risk=							1E-03

Key

NA : Not Applicable

Table 13: Risk Characterization Summary for the Recreational Child Resident – Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Commercial/Residential Area	Dibenzofuran	Respiratory	3	NA	4	7
							Receptor Hazard Index=	7
							Respiratory Hazard Index=	7

Key

NA: Not Applicable

Table 14: Risk Characterization Summary for the Recreational Adult Resident – Non-Carcinogens								
Scenario Timeframe: Future **Receptor Population: Recreational** **Receptor Age: Adult**								
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Primary Target Organ**	**Non-Carcinogenic Hazard Quotient**			
					Ingestion	**Inhalation**	**Dermal**	**Exposure Routes Total**
Surface Soil	Surface Soil	Commercial/Residential Area	Dibenzofuran	Respiratory	0.3	NA	2	2
							Receptor Hazard Index=	2
							Respiratory Hazard Index=	2

Key

NA: Not Applicable

Table 15: Risk Characterization Summary for the Construction/Excavation Worker – Non-Carcinogens								
Scenario Timeframe: Future **Receptor Population: Construction/Excavation Worker** ***Receptor Age: Adult***								
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Primary Target Organ**	**Non-Carcinogenic Hazard Quotient**			
					Ingestion	**Inhalation**	**Dermal**	**Exposure Routes Total**
Subsurface Soil	Subsurface Soil	*Former* Pressure Vessel Area	2 –Methylnapthalene	Respiratory	1	NA	0.2	1
							Receptor Hazard Index=	1
							Respiratory Hazard Index=	1
Key NA: Not Applicable								

Table 16: Risk Characterization Summary for the Child Resident – Non-Carcinogens								
Scenario Timeframe: Future **Receptor Population: Resident** **Receptor Age: Child**								
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Primary Target Organ**	**Non-Carcinogenic Hazard Quotient**			
					Ingestion	**Inhalation**	**Dermal**	**Exposure Routes Total**
Ground Water	**Ground Water**	**Shallow Ground Water**	2,4-Dimethylphenol	CNS/Blood	0.07	NA	NA	0.07
			2-Methylnapthalene	Respiratory	0.9	0.9	NA	2
			Dibenzofuran	Kidney	1	NA	NA	1
			Naphthalene	Body Weight	2	2	NA	4
			Phenanthrene	Kidney	0.08	NA	NA	0.08
			Manganese	CNS	1	NA	NA	1
							Receptor Hazard Index=	8
Medium **Ground Water**	**Exposure Medium** **Ground Water**	**Exposure Point** **Intermediate Ground Water**	2-Methylnapthalene	Respiratory	5	5	NA	10
			Acenaphthene	Liver	0.2	0.2	NA	0.4
			Dibenzofuran	Kidney	5	NA	NA	5
			Flourene	Blood	0.2	0.2	NA	0.4
			Naphthalene	Body Weight	12	12	NA	24
			Phenanthrene	Kidney	0.2	NA	NA	0.2
			Manganese	CNS	3	NA	NA	3
			Nickel	Organ Weight/ Body Weight	0.3	NA	NA	0.3
							Receptor Hazard Index=	43
							Total Shallow and Intermediate Ground Water Receptor Hazard Index=	52
							CNS/Blood Hazard Index=	0.07
							Respiratory Hazard Index=	12
							Kidney Hazard Index=	6.28
							Body Weight Hàzard Index=	28
							CNS Hazard Index=	4
							Liver Hazard Index=	0.4
							Blood Hazard Index=	0.4
							Organ Weight/Body Weight Hazard Index=	0.3
Key NA: Not Applicable CNS : Central Nervous System								

Table 17: Risk Characterization Summary for the Adult Resident – Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground Water	Ground Water	Shallow Ground Water	2-Methylnapthalene	Respiratory	0.9	.09	NA	1
			Dibenzofuran	Kidney	1	NA	NA	1
			Naphthalene	Body Weight	2	2	NA	4
			Pentachlorophenol	Liver/Kidney	0.1	NA	NA	0.1
			Manganese	CNS	1	NA	NA	1
							Receptor Hazard Index=	7
Medium	**Exposure Medium**	**Exposure Point**						
Ground Water	Ground Water	Intermediate Ground Water	2-Methylnapthalene	Respiratory	2	2	NA	4
			Acenaphthene	Liver	0.1	0.1	NA	0.2
			Dibenzofuran	Kidney	2	NA	NA	2
			Flourene	Blood	0.09	0.09	NA	0.2
			Naphthalene	Body Weight	5	5	NA	10
			Manganese	CNS	1	NA	NA	1
			Nickel	Organ Weight/Body Weight	0.12	NA	NA	0.12
							Receptor Hazard Index=	18
							Total Shallow and Intermediate Ground Water Receptor Hazard Index=	25
							Respiratory Hazard Index=	6
							Kidney Hazard Index=	3
							Body Weight Hazard Index=	14
							Liver/Kidney Hazard Index=	0.1
							CNS Hazard Index=	2
							Liver Hazard Index=	0.2
							Blood Hazard Index=	0.2
							Organ Weight/Body Weight Hazard Index=	0.12

Key:

NA: Not Applicable
CNS : Central Nervous System

Table 18
Human Health Risk-Based Cleanup Goals for Surface Soil
Camilla Wood Preserving Site
Camilla, Mitchell County, Georgia

Chemical of Concern	Cleanup Level (ug/kg)	Basis for Cleanup Level	Risk at Cleanup Level[1]
cPAHs	1,310	Human Health Risk-Based Level – Lifetime Recreational User	10^{-5} Excess Cancer Risk
Dibenzofuran	438,702	Human Health Risk-Based Level – Child Recreational User	HI = 1
Pentachlorophenol	46,378	Human Health Risk- Based Level – Lifetime Recreational User	10^{-5} Excess Cancer Risk
2,3,7,8-TCDD TEQ (Dioxin)	1	Residential – EPA 1998 OSWER Directive	10^{-4}

Abbreviations
EPA Environmental Protection Agency
HI hazard index
OSWER Office of Solid Waste and Emergency Response
ug/kg milligram per kilogram

Notes

[1] Cleanup levels and residual risk information presented in this table are based on the risk associated with exposure to contamination through incidental ingestion and dermal contact by the child and adult recreational user.

Table 19
Human Health Risk-Based Cleanup Goals for Subsurface Soil
Camilla Wood Preserving Site
Camilla, Mitchell County, Georgia

Chemical of Concern	Cleanup Level (ug/kg)	Basis for Cleanup Level	Risk at Cleanup Level[1]
cPAHs	300	Ground Water Protection Standard	10^{-6} Excess Cancer Risk
2-Methylnaphthalene	1,034,937	Human Health Risk-Based Level – Construction/Excavation Worker	HI = 1
Pentachlorophenol	7	Ground Water Protection Standard	10^{-6} Excess Cancer Risk

Abbreviations
ug/kg milligram per kilogram
HI hazard index

Notes

[1] Cleanup levels and residual risk information presented in this table are based on the risk associated with exposure to contamination through incidental ingestion, dermal contact, and inhalation by a construction/excavation worker.

Table 20
Human Health Risk-Based Cleanup Goals for Ground Water
Camilla Wood Preserving Site
Camilla, Mitchell County, Georgia

Chemical of Concern	Cleanup Level (ug/L)	Basis for Cleanup Level	Risk at Cleanup Level[1]
Benzene	5	MCL	10^{-6} Excess Cancer Risk
Ethylbenzene	700	MCL	10^{-6} Excess Cancer Risk
2,4-Dimethylphenol	313	Human Health Risk-Based Level – Child Resident	HI =1
2-Methylnapthalene	31	Human Health Risk-Based Level – Child Resident	HI =1
Acenaphtene	469	Human Health Risk-Based Level – Child Resident	HI =1
cPAHs	0.2	MCL	
Carbazole	48	Human Health Risk-Based Level – Lifetime Resident	10^{-5} Excess Cancer Risk
Dibenzofuran	31	Human Health Risk-Based Level – Child Resident	HI =1
Fluorene	313	Human Health Risk-Based Level – Child Resident	HI =1
Naphthalene	156	Human Health Risk-Based Level – Child Resident	HI =1
Pentachlorophenol	1	MCL	10^{-6} Excess Cancer Risk
Phenanthrene	469	Human Health Risk-Based Level – Child Resident	HI =1
Heptachlor Epoxide	0.2	MCL	10^{-6} Excess Cancer Risk
Arsenic	10	MCL	10^{-6} Excess Cancer Risk
Manganese	300	Lifetime Health Advisory	10^{-6} Excess Cancer Risk
Nickel	313	Human Health Risk-Based Level – Child Resident	HI =1

Abbreviations
ug/kL milligram per liter
HI hazard index
MCL maximum contaminant level

Notes

[1] Cleanup levels and residual risk information presented in this table are based on the risk associated with exposure to contamination through incidental ingestion, dermal contact, and inhalation while showering by child and adult residents.

Table 21
Comparative Analysis of Soil Alternatives
Camilla Wood Treatment (Escambia) Site
Camilla, Mitchell County, Georgia

Remedial Alternative	Criteria Rating						Approximate Present Worth ($)	Score
	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of M/T/V Through Treatment	Short-Term Effectiveness	Implementability		
1 -- No Action	0	0	0	0	5	5	$ 93,850	2.14
2 -- Excavation, ex situ S/S, off site disposal, and containment	5	4	5	3	3	4	$ 32,492,090	3.71
3 -- Excavation, onsite treatment with thermal desorption, and onsite disposal	4	4	5	4	2	2	$ 53,054,090	3.14
4 -- Excavation, in situ source treatment, ex situ S/S, offsite disposal, and compression grouting	5	4	4	3	4	3	$ 29,134,100	3.71
5 -- In situ S/S, source containment, and stormwater improvements	5	4	5	4	4	4	$ 10,691,320	4.29

A ranking of “0” indicates noncompliance, while a ranking of “5” indicates complete compliance.

Table 22
Comparative Analysis of Groundwater Alternatives
Camilla Wood Treatment (Escambia) Site
Camilla, Mitchell County, Georgia

Remedial Alternative	Criteria Rating						Approximate Present Worth ($)	Score
	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of M/T/V Through Treatment	Short-Term Effectiveness	Implementability		
1 -- No Action	0	0	0	0	5	5	$ 184,680	2.14
2 – In situ chemical oxidation	5	4	4	5	4	4	$ 2,928,960	4.29

A ranking of "0" indicates noncompliance, while a ranking of "5" indicates complete compliance.

Table 23
Chemical-Specific ARARs
Remedial Investigation
Camilla Wood Treatment Site
Camilla, Mitchell County, Georgia

Standards, Requirements, Criteria, or Limitations	Citation	Description	Comments (Applicable or Relevant and Appropriate)
FEDERAL			
Safe Drinking Water Act (SDWA)	40 United States Code (USC) 300		
National Primary Drinking Water Standards	40 Code of Federal Regulations (CFR) Part 141, Subpart B and G	Established maximum contaminant levels (MCLs) which are health-based standards for public water systems.	Relevant and Appropriate
Clean Water Act	33 USC Sect. 1251-1376		
Federal Water Quality Criteria	40 CFR Part 131	Requires the states to develop criteria for water quality that accurately reflects the latest scientific knowledge. These criteria are based solely on data and scientific judgments on pollutant concentrations and environmental or human health effects under Section 304(a) of the Clean Water Act. Section 304(a) also provides guidance to states and tribes in adopting water quality standards. Criteria are developed for the protection of aquatic life as well as for human health.	Relevant and Appropriate
Clean Air Act	42 USC Sect. 7401-7642		
Clean Air Act - National Primary and Secondary Ambient Air Quality Standards (NAAQS)	42USC §7409 40CFR Part 50	Air quality levels that protect public health.	Relevant and Appropriate
STATE			
Rules for Safe Drinking Water	OCGA 12-5-170	Establishes policies, procedures, requirements and standards to implement the State of Georgia Safe Drinking Water Act and to carry out the purposes and requirements of the federal Safe Drinking Water Act. Particular subparagraphs within this rule include primary MCLs, secondary MCLs, and treatment technique action levels.	Relevant and Appropriate
Georgia Water Quality Control Act	OCGA 12-5-2	Establishes the orginazational and adminsitrative procedures to be followed in the administration and enforcement of the Georgia Water Quality Control Act and to carry out the purposes and requirements of the federal Water Pollution Control Act. Paricular subparagraphs wiithin this rule include water use classifications and water quality standards.	Relevant and Appropriate
Georgia Hazardous Site Response Act	OCGA 12-8-90	Establishes the policies, procedures, requirements, and standards to implement the State of Georgia Hazardous Site Response Act. Particular subparagraphs establish risk reduction standards.	Relevant and Appropriate

Notes:
USC - United States Code
CFR - Code of Federal Regulation
OCGA - Official Code of Georgia

Table 24
Location-Specific ARARs
Remedial Investigation
Camilla Wood Treatment Site
Camilla, Mitchell County, Georgia

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comments (Applicable or Relevant and Appropriate)
FEDERAL			
National Environmental Policy Act of 1969	42USC §§4321-4347	Requires federal agencies to prepare comprehensive environmental impact statements for every recommendation on proposals for legislation and federal actions which might significantly affect the quality of the environment.	Relevant and Appropriate
Resource Conservation and Recovery Act	40CFR Part 264	Requires remediation waste management site owners/operators to design, construct, operate, and maintain a unit within a 100- year floodplain to prevent washout of any hazardous waste by a 100-year flood.	Applicable
Rivers and Harbors Act of 1899	33 USC Sect. 403		
Executive Order on Protection of Wetlands	Executive Order No. 11,990 40 CFR 6.302(a) and Appendix A	Requires Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists.	Relevant and Appropriate
Executive Order on Flood Plain Management	Executive Order No. 11,988	Action to avoid effects, minimize potential harm and restore and preserve natural and beneficial values of the flood plain.	Relevant and Appropriate
STATE			
Erosion and Sedimentation Control	Georgia Chapter 391-3-7	Establishes the requirements for obtaining a permit prior to any land distrubance. A plan must be developed prior to any land distrubance. In addition, any land distrubing activity proposed within a 100-year floodplain must not adversely affect upstream or downstream properties by causing flooding, erosion and sedimentation.	Relevant and Appropriate

Notes:

USC - United States Code
CFR - Code of Federal Regulatior

Table 25
Action-Specific ARARs
Remedial Investigation
Camilla Wood Treatment Site
Camilla, Mitchell County, Georgia

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comments (Applicable or Relevant and Appropriate)
FEDERAL			
Solid Waste Disposal Act	40 United States Code (USC) 6901-6987		
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 Code of Federal Regulations (CFR) Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health, and thereby constitute prohibited open dumps.	Relevant and Appropriate
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the U.S. if the transportation requires a manifest under 40 CFR Part 262.	Applicable
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste.	Relevant and Appropriate
Safe Drinking Water Act	42 USC Sect. 300(f)		
Underground Injection Control (UIC) Regulations	40 CFR Parts 144-147	Provides for protection of underground sources of drinking water.	Relevant and Appropriate
Clean Water Act	33 USC Sect. 1251-1376		
Dredge and Fill Requirements [Section 404 I]	40 CFR Part 230	Action to prohibit discharge of dredged or fill material into wetland without permit.	Relevant and Appropriate
National Pollutant Discharge Elimination System (NPDES)	40 CFR Parts 122 and 125	Requires permits for the discharge of pollutants from any point source into waters of the United States.	Relevant and Appropriate
Clean Air Act	42 USC Sect. 7401-7642		
National Ambient Air Quality Standards	40 CFR 50.1-.17. .50-.54; .150-.154 .480-.489; 40 CFR 53.1-.33; 40 CFR 61.01-.18 .50-.112, .240-.247	Treatment technology standard for emissions to air from incinerators, surface impoundments, waste piles, landfills, and fugitive emissions.	Applicable (Part 61) Remainder are Relevant and Appropriate
Noise Control Act of 1972	42 USC Sect. 4901 et seq.	Federal activities must not result in noise that will jeopardize the health or welfare of public.	TBC
Hazardous Materials Transportation Act	49 USC Sect. 1801-1813		
Hazardous Materials Transportation Regulations	49 CFR Parts 107, 171-177	Regulates transportation of hazardous materials.	Applicable

Table 25
Action-Specific ARARs
Remedial Investigation
Camilla Wood Treatment Site
Camilla, Mitchell County, Georgia

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comments (Applicable or Relevant and Appropriate)
STATE			
Standards for wells and boreholes	OCGA 12-5-134	Standards established for construction of monitring wells requiremnets of abandonmnet	Applicable
Georgia Hazardous Waste Management Act	OCGA 12-8-61	Management of Hazardous waste through regulation of the generation, transportaion, storage, treatment and disposal of hazardous waste	Relevant and Appropriate
Air Quality Control	OCGA 12-9-1	Sets forth ambient air quality standards which establishes certain maximum limits on parameters of air quality considered desirable for the preservation and enhancements of the quality of the State's air resources.	Relevant and Appropriate
Water Quality Control	Georgia Chapter 391-3-6	Section 0.13 establishes classes of injection wells, prohibitions, criteria, and standards applicable to injection wells.	Relevant and Appropriate
Rules for Safe Drinking Water	OCGA 12-5-170	Establishes policies, procedures, requirements and standards to implement the State of Georgia Safe Drinking Water Act and to carry out the purposes and requirements of the federal Safe Drinking Water Act. Particular subparagraphs within this rule include primary MCLs, secondary MCLs, and treatment technique action levels.	Relevant and Appropriate

Notes:
USC - United States Code
CFR - Code of Federal Regulation
OCGA - Official Code of Georgia

FIGURES

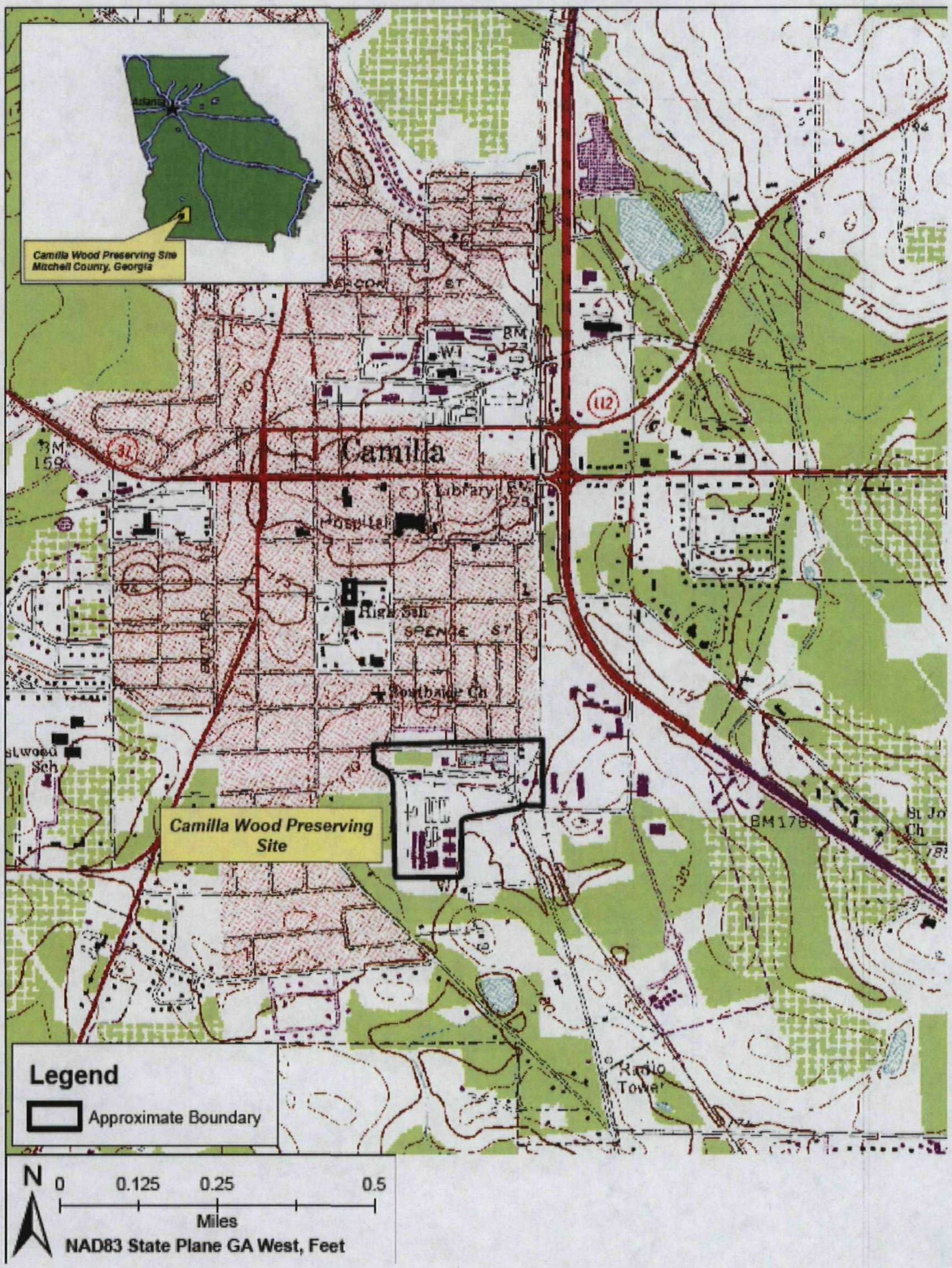


Figure 1. Site Location

Figure 2. Historical Aerial Photo

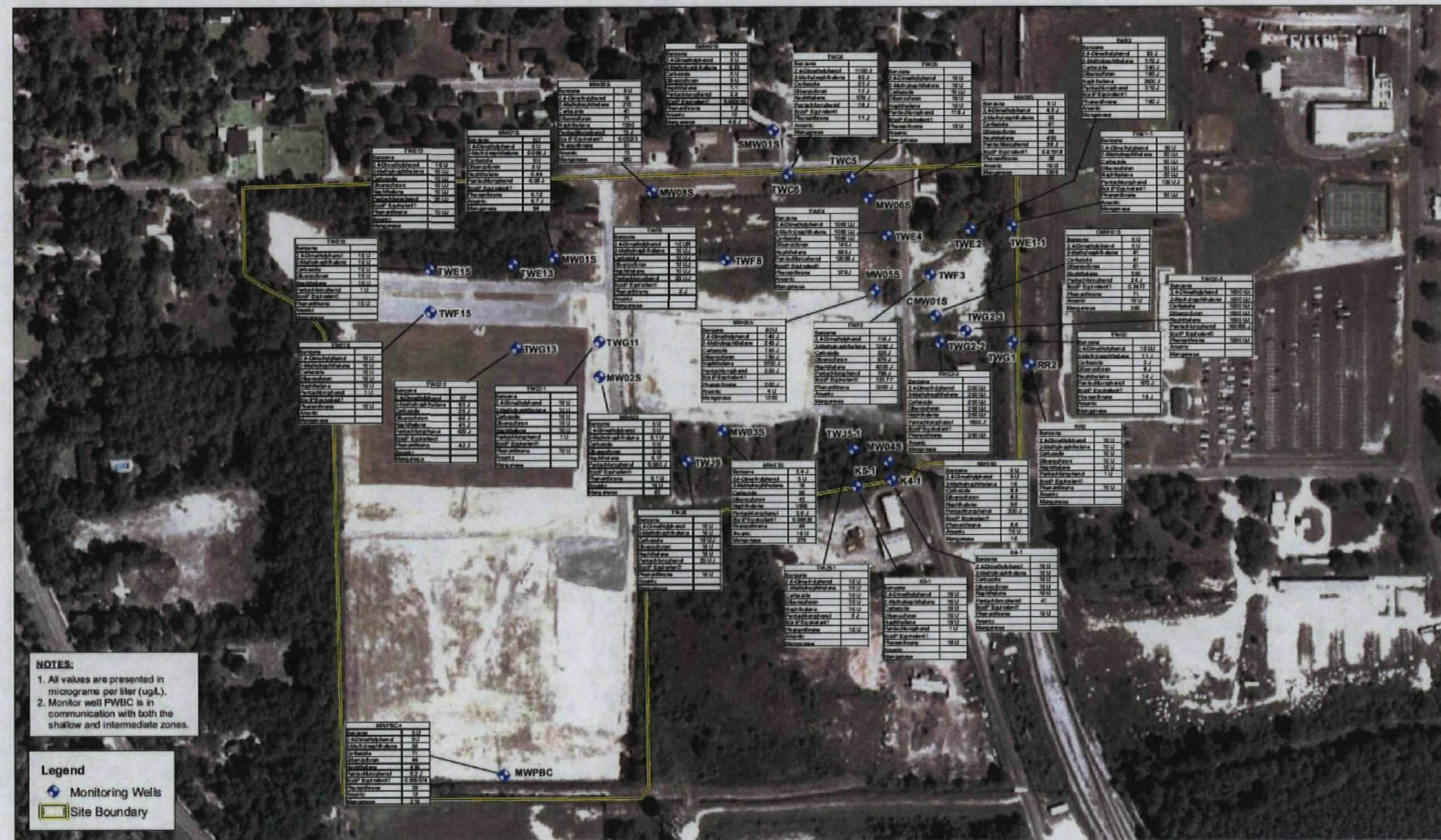


Figure 3 Contaminants of Potential Concern in Shallow Ground Water

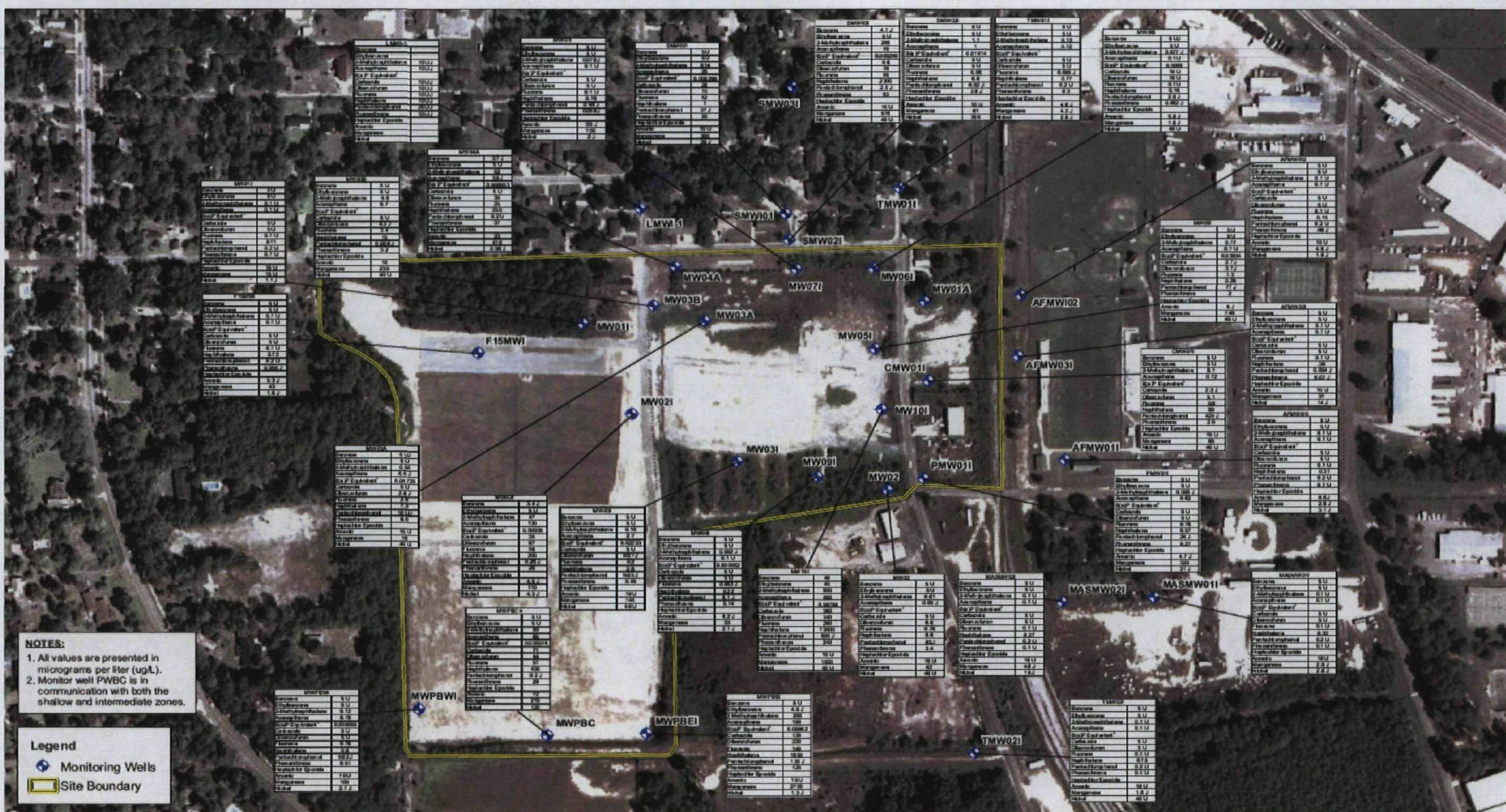
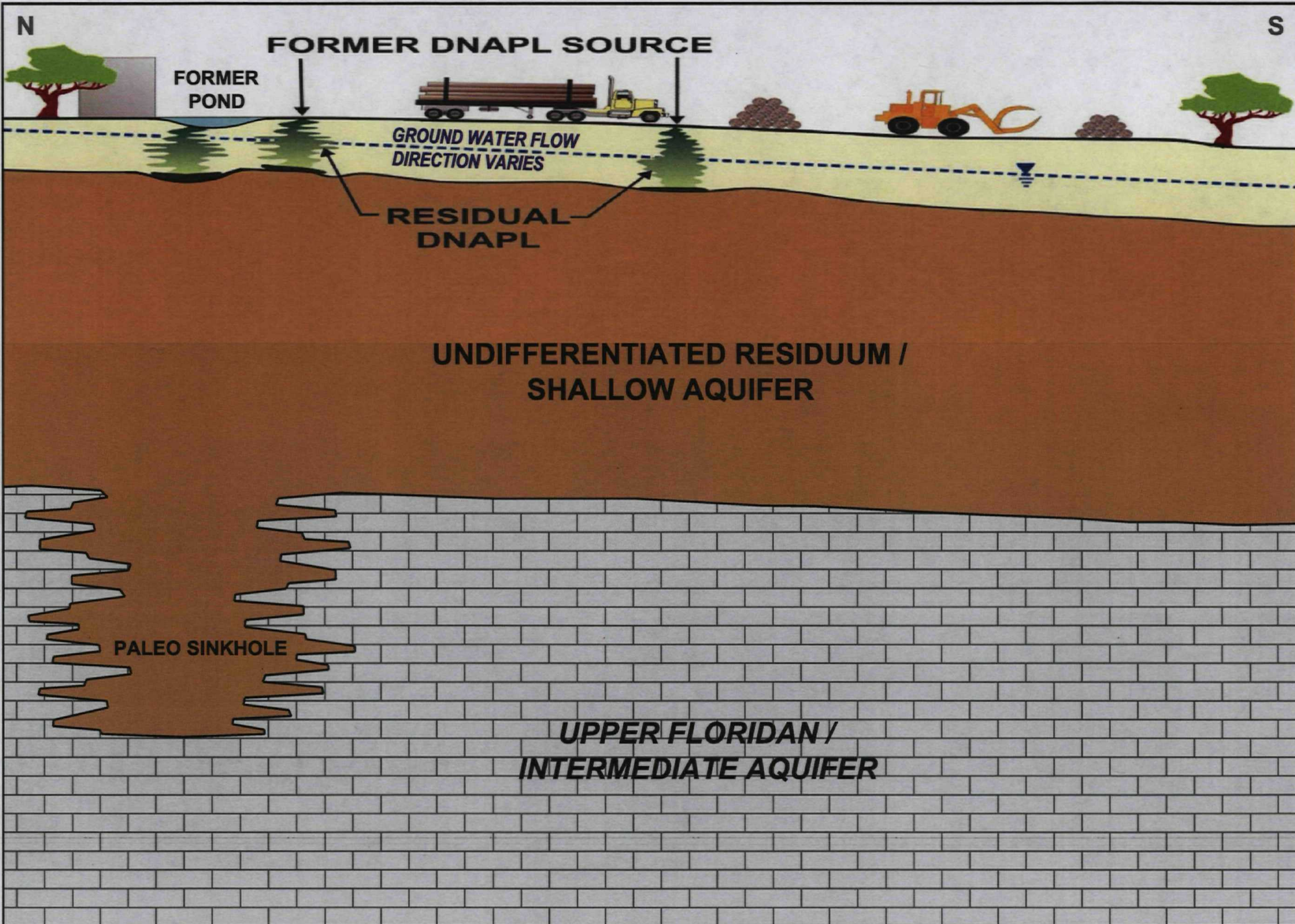


Figure 4 Contaminants of Potential Concern in Intermediate Ground Water



CONCEPTUAL SITE MODEL
CAMILLA WOOD SITE, CAMILLA, GEORGIA

FIGURE
5

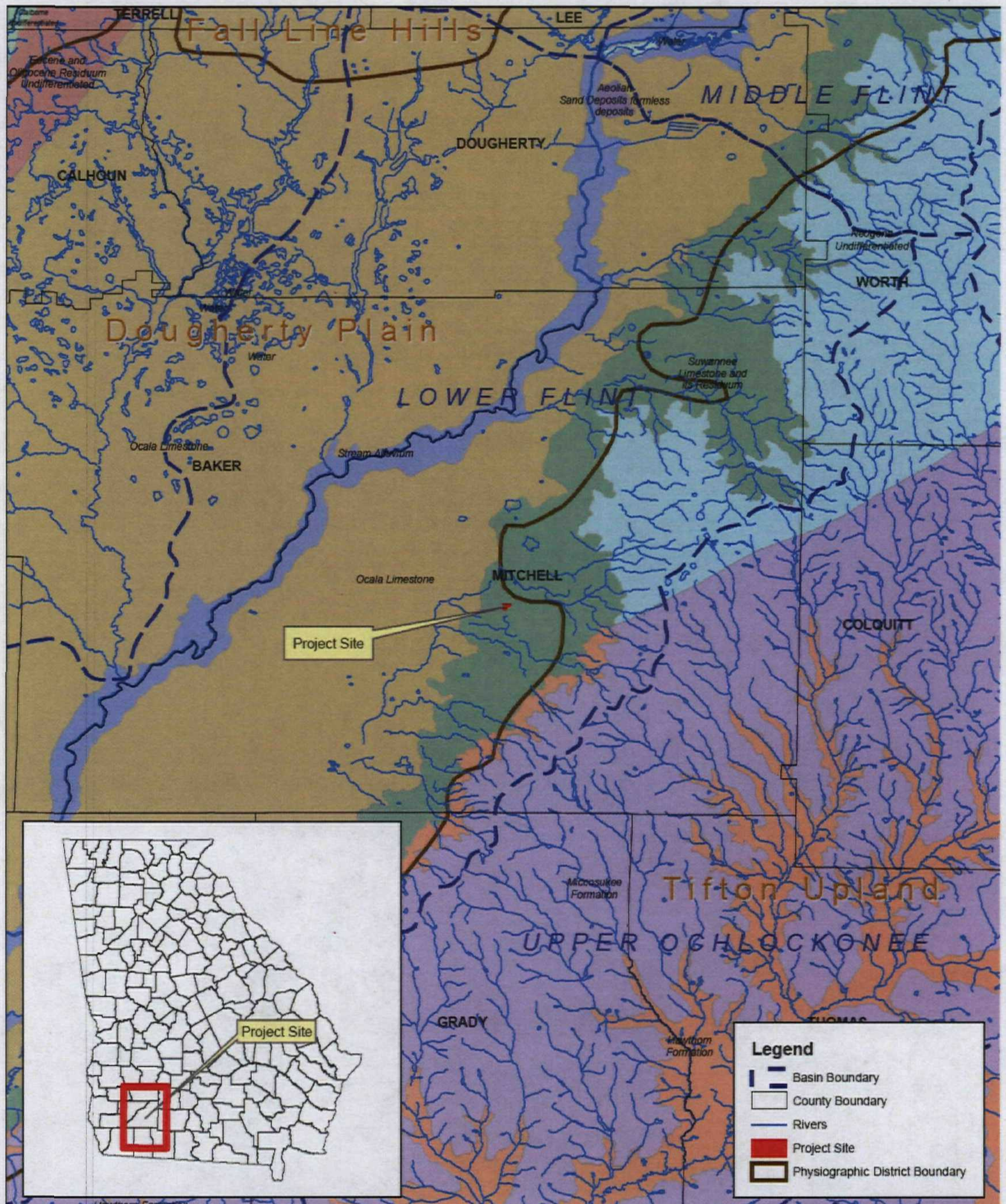


Figure 6. Regional Geologic Features

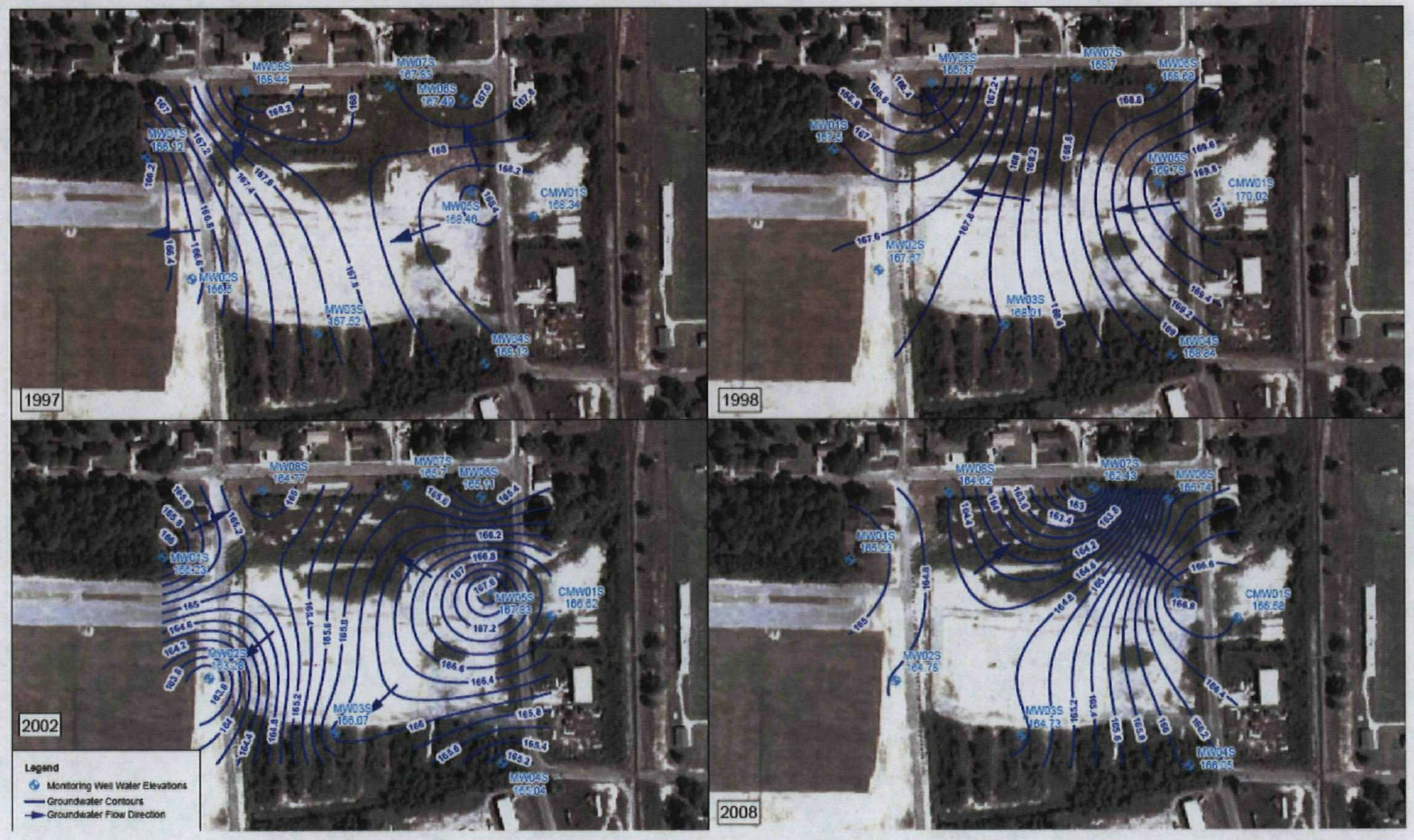


Figure 7. Water Level Elevations – Shallow Wells

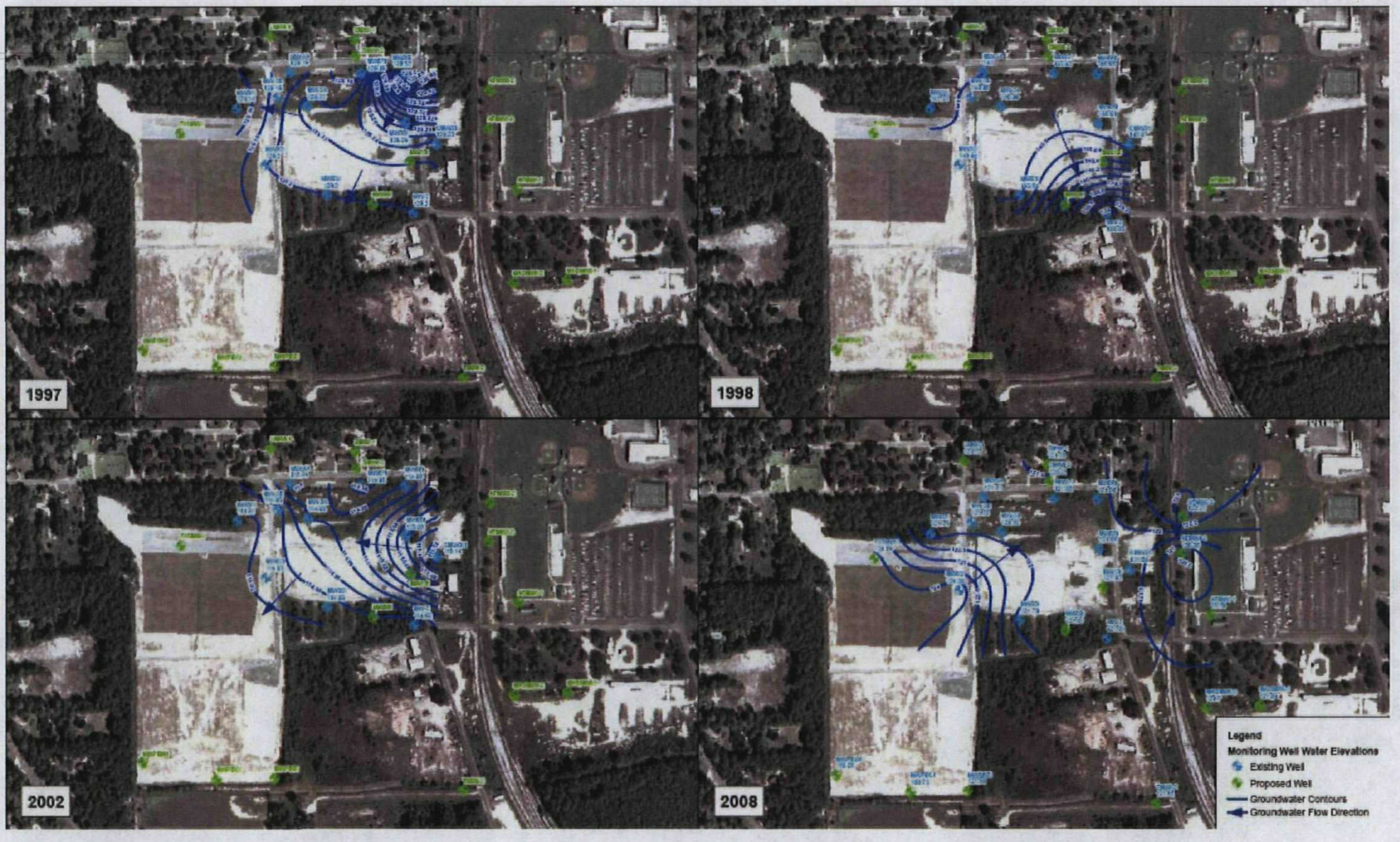


Figure 8. Water Level Elevations – Intermediate Wells

Figure 9. Shallow Ground Water Naphthalene Isoconcentration Map

Figure 10. Shallow Ground Water Pentachlorophenol Isoconcentration Map

Figure 11. Intermediate Ground Water Naphthalene Isoconcentration Map

Figure 12. Intermediate Ground Water Pentachlorophenol Isoconcentration Map

Figure 13. Surface Soil – B(a)P Equivalents

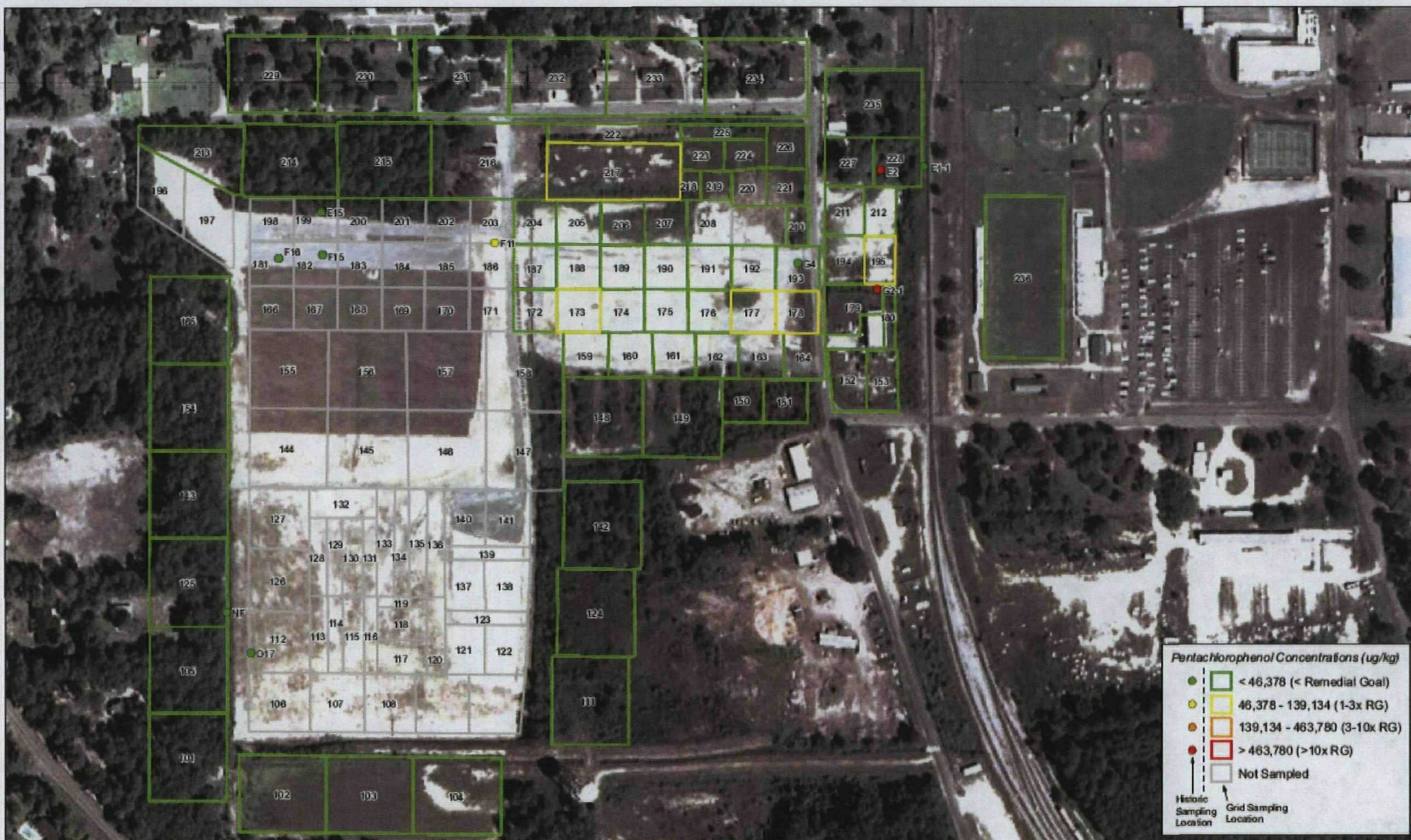


Figure 14. Surface Soil - Pentachlorophenol

Figure 15. Surface Soil – Dioxin TEQ

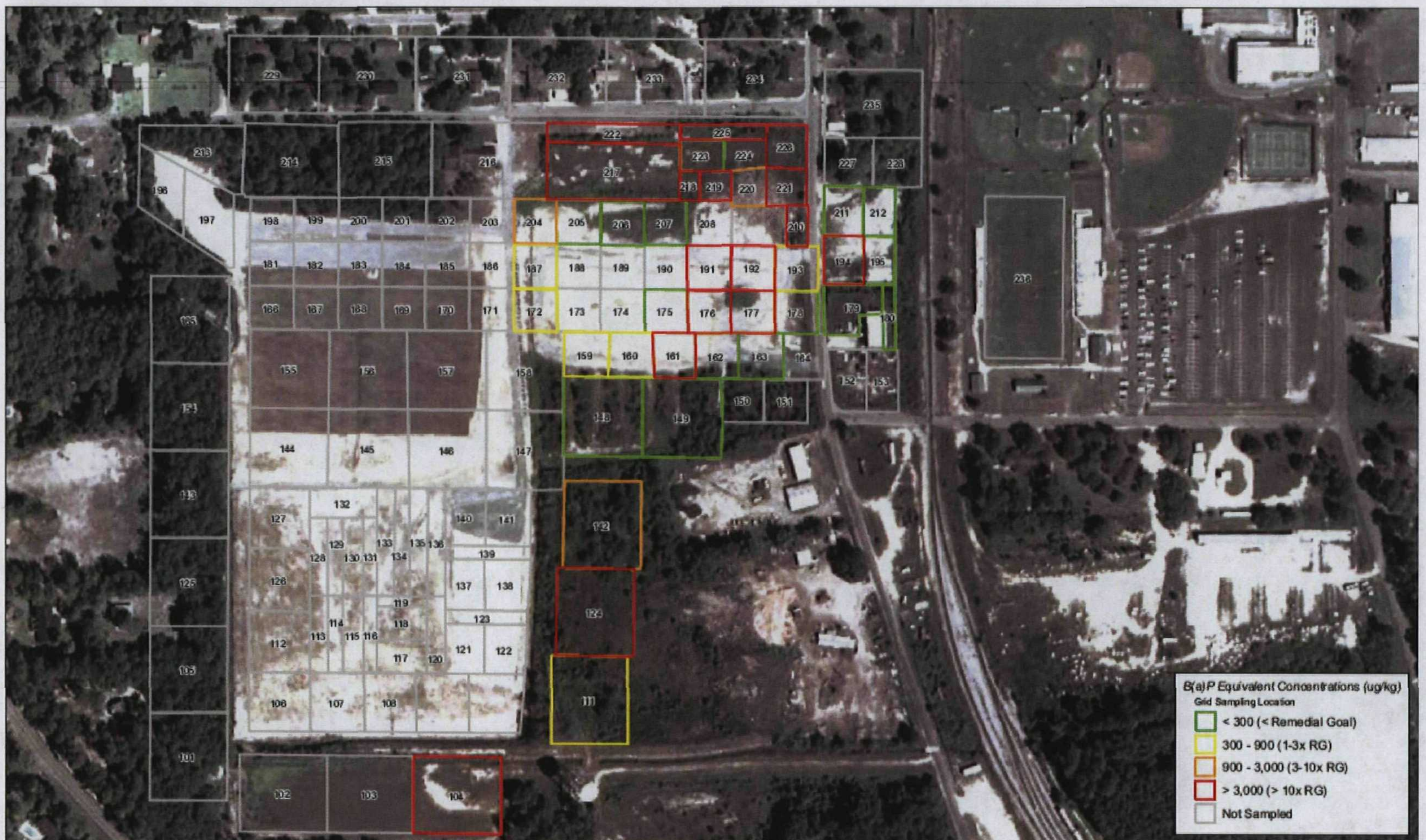


Figure 16. Subsurface Soil B(a)P Equivalents

Figure 17. Subsurface Soil - Pentachlorophenol

Figure 18. Exposure Units

Figure 19. Preferred Remedial Alternative S-5

APPENDIX A

Public Meeting Transcript

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUPERFUND PROPOSED PLAN

CAMILLA WOOD TREATMENT (ESCAMBIA)

PUBLIC MEETING

AUGUST 20, 2009

SOUTHWEST GEORGIA REGIONAL COMMISSION BUILDING

AA McNEIL ROOM, 2nd FLOOR

30 BROAD STREET

CAMILLA, GEORGIA 31730

Transcript of the public hearing held at the aforementioned location, as taken before Norma A. Wilson, Certified Court Reporter, License Number B-1777, commencing at 6:40 p.m., as follows:

NORMA A. WILSON, CCR
ASSOCIATED COURT REPORTERS
1511 5TH AVENUE
ALBANY, GEORGIA 31707-3638
229/888-3376

APPEARANCES

Angela R. Miller
Public Affairs Specialist
Waste Management Division
Community Involvement Coordinator
USEPA Region 4

Scott Miller
Remedial Project Manager
USEPA Region 4

W. David Keefer, Chief
Remedial Section C
USEPA Region 4

Ben Bentkowski, P.G.
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Federal Services Division
Black & Veatch

Jim McNamara
Unit Coordinator
Hazardous Waste Management
Georgia Environmental Protection Division
Department of Natural Resources

Penny Gaynor
Geologist
Hazardous Waste Management
Georgia Environmental Protection Division
Department of Natural Resources

D I S C L O S U R E

STATE OF GEORGIA

COUNTY OF DOUGHERTY

Pursuant to Article 8.B of the Rules and Regulations of the Board of Court Reporting of the Judicial Council of Georgia, I make the following disclosure:

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This 3rd day of September, 2009.

Norma A. Wilson

NORMA A. WILSON, CCR
License No. B-1777

P R O C E E D I N G S

MS. MILLER: I guess we'll go ahead and get started tonight. My name is Angela Miller. I'm Community Involvement Coordinator for the Environmental Protection Agency and we're here tonight to talk about a remedy that we're going to propose to implement at the Camilla Wood Preserving Site, and we are in a comment period right now. The comment period started August the 12th and it runs through September the 10th. You can either submit them in writing, email, you can call. Questions or comments are going to be recorded tonight. We have a court reporter who's going to transcribe the whole meeting, so your comment will go on record. Your questions will go on record tonight. There's going to be a presentation in the beginning, and then after the presentation we'll have questions and answers. If you could, if you'll hold your questions until the end, unless you need Scott to clarify something. And the sign-in sheets, if you didn't sign in, if you would sign in, that's part of our mailing list. If you're on the mailing list, you'll receive all of the fact sheets and updates of the site. And we'll let you know if a fishing pond is going in. I think that's it. With that, I'll turn it over to the Project Manager, Scott Miller.

MR. MILLER: Thank you, Angela. All right, I've got to see where I can stand so I'm not in you guys' way.

Appreciate y'all coming out tonight. We'll start off with welcome and introductions. I want to introduce you to a couple of folks. I'm with the Federal EPA, Environmental Protection Agency, but we don't do anything alone. We work with the State of Georgia Environmental Protection Division, and I want to introduce you to a couple of folks tonight: Penny Gaynor, who's the geologist for the Camilla Wood Site; Jim McNamara, who's in supervision for the site; David Keefer, who's my boss, EPA Region 4; Kevin Brown, who's the Project Manager for Black & Veatch who's the contractor working on the site; and Ben Bentkowski, who's the hydrologist that's working with us at the Federal EPA on the site. Whoops, I suppose that would have been better had I had that up. But anyway, Ben, sorry you didn't make that slide. I'll do better next time, I promise.

MS. MILLER: Make a note.

MR. MILLER: So what is Superfund? Superfund, we're just going to do a little intro, of course, about Superfund. I know you guys have lived at the site for awhile based on what you were just telling me. I don't know if you guys - You guys are so young. Maybe you lived nearby for awhile.

UNIDENTIFIED MALE: Yeah.

MR. MILLER: What Superfund is, is a law that congress passed that basically said that you have to clean up abandoned hazardous waste sites. Most of the time you find the people responsible and you make them clean it up, but we found the people responsible and they were bankrupt, or some other situation came up, so that means that the duty passed to the Federal EPA to have to clean it up.

There are two types of actions under the Federal Superfund Law. One is a removal action and the other one is a remedial action. Removal actions are typically short-term actions. Most often it's removing contaminated soils that have gone off-site that pose acute risks, also removing equipment and such, and there's been four of these types of actions at the site, at the Camilla Wood Site since 1998. Some of you folks who've been there for a while may remember where they went off-site and they took some soil away, also when they tore all those buildings down and took them away and then the old process units and everything. Then they filled in those impoundments that were up there at the corner of Bennett and Thomas Street and took hazardous waste away. Those were removal actions.

Tonight what we're here to talk about is a more long-term response and that's a remedial action, and they permanently and significantly change what's going on out there, and in particular have to do with soil that's at the subsurface, you know, below ground level, or groundwater that's contaminated, as well as surface water, although there's no surface water that was found contaminated out at the site.

Just a little bit about the Superfund Remedial Process. Can you guys see okay? We have a couple of steps. We go from site discovery to site evaluation, then we put it on a list that we call our National Priorities List. This Site was listed on the National Priorities List in 1998. Then we do a remedial investigation and that's where we collect data to try and figure out what contamination is present on the site. And then we go from there to a feasibility study where we look at technology options to address contamination on the site. And we use the data that we've collected from the remedial investigation to help formulate technology options and things that'll address contamination on the site. Then we come up with - After we do a feasibility study, which we've completed, we come up with a preferred option and we look at a proposed plan of what we think we might do to clean up the site for the long-term, and that's where we are tonight. That's what we're talking about, which is the EPA's - and the EPD is onboard as well - long-term response action for the site. After that we go through - After we take your public comments and we take comments from others, we go through and come up with the final plan of action and we put that in a document that's called the Record of Decision; that'll come later. And then after that we come up with Remedial Design, and that's basically where we take our tape measure out and start measuring up on the site how we're actually going to put technologies to work on the site to clean up the groundwater and the surface water, soil and sediment. Then we go into Remedial Action. That's where we construct and build these technology options. We go into a period of Operation and Maintenance whereby it sometimes takes time for the remedies that we construct to actually clean the site up entirely. That's the time period we call Operation and Maintenance, where we're getting to that point in the site's life where they meet those remedial goals that we set up on the front end. Then after that we delete it from the National Priorities List.

We value community participation because we want to hear what you've got to say. It's important to hear that, "I want a fishing pond." That's good information to know. And I don't know if you got a chance to look at this presentation before I came in tonight or not, but we're going to talk about something that could be a fishing pond out there. We kind of have a unique situation in this site in that the county and the city, the City of Camilla and Mitchell County have gotten together and have decided that they want to reuse this site and have started on that first half with soccer fields, and they're going to put a RV park there and some hiking paths. I think they've started on that western side of that site over there. So we have a unique opportunity here because we've got people who've come forward to be stewards of the property. They've done this voluntarily. There's no requirement to do so. A lot of times Superfund sites just have a fence around them. But we like to see reuse. We like to see land revitalized, especially well-located land like this. This is a perfect place for a park. I'm sure you'd agree with that.

What we do with respect to the Proposed Plan Comment Period, we have a comment period for up to thirty days. You heard Angela discuss up here that the comment period started the 12th of August and goes through the 10th of September. We welcome your comments on any aspect of the project that we're working on related to this.

The Administrative Record is a listing of the documents that we used, typically information that we gathered during the Remedial Investigation and the Feasibility Study, and that's on file here at the Desoto Library, just up the street, down the street on the right. And it's available electronically, all the documents, not only just a listing of the documents, but all the documents that we use to come to the conclusions that we did with respect to where we're headed with site remediation.

The Camilla Wood Site is bounded on the north by East Bennett Street, on the east by Thomas Street, the west near South Harney Street, and then southeast by that Georgia DOT facility. I think most people know where that is. It's kind of big. Down there just a little bit south of that - gosh, I'm sorry, I've drawn a blank on the street itself. Where the high school football field is.

UNIDENTIFIED FEMALE: Thomas Street.

MR. MILLER: Is it Thomas Street?

UNIDENTIFIED FEMALE: That's right.

MR. MILLER: Okay, Thomas Street. Thank you. It's approximately 50 acres in size. They conducted wood preserving activities out there from 1947 to 1991. They basically used the process of pentachlorophenol and steam, over time, to treat these wood products so that they wouldn't have termites get in them. They treated telephone poles and things and railroad ties. They also used a creosote process out there. And what we found is that those things that they used to treat the wood ended up in the soil and in the groundwater.

Like we talked about earlier, the western portion of the site has been restored to two soccer fields. They're working on a RV park there. They haven't put the RV park into use yet, but you can kind of see risers if you go by there. And it is open, by the way, for those who have interest. I think it's Mitchell County Parks and Recreation that actually runs it day to day. They're real friendly. You can drop in. They told me they've got aerobics on

Monday. So, if aerobics are your bag, they're doing that. I don't know what else they're doing there, but they've got someone that's there full-time during the week.

I just want to go a little bit over the nature and extent of the contamination out there. When we say contamination, we've got standards. We've got Preliminary Remedial Goals for soil and sediments and maximum contaminant levels for groundwater and surface water. The maximum contaminant levels are the same standards that your city water system is held to, and it's health based. It's basically an allowable concentration of a pollutant that can be in water for humans to drink. So it's a pretty strong standard.

In surface soil, 32 of 134 grids exceed the remedial PRGs, subsurface soil is about the same number. Most of that has to do with the fact that there's this pentachlorophenol that was the old wood treatment fluid that spilled over into the soil and then has leached to groundwater over time.

UNIDENTIFIED MALE: Scott, approximately how big are each grid? You mentioned 134 grids are composing the site.

UNIDENTIFIED MALE: They're various sizes. Some were 100 by 100, some looked to be 200 by 200.

MR. MILLER: Yeah, we're going to show you kind of a segment, what that looks like. If you can see that. The site itself is approximately 50 acres, and there's 134 of them, so that's a third of an acre approximately for a grid size, if they were all cut up into equal parts.

This is kind of what the site looked like back in the seventies. The reason we keep this around is not to remind you that it looks so much prettier now, but it's more just to give you a feel for where the contamination was the worst. This is Thomas Street right here, and here's Bennett Street - my bad - Bennett Street is right here, and Thomas Street is right here. So where you see the black soil is known as the drip track and that's where they left the wood once they treated it, and so the stuff that they treated it with dripped out onto the ground. And the other area of intense soil contamination and groundwater impacts are these old impoundments here. Those since have been filled in, and part of the remedial action - excuse me - the soil removal action they took and solidified and removed some of this offsite. But that doesn't mean that the impacts to the groundwater or the soil are gone yet. That's part of what we're treating as part of this proposed plan.

You can also see now where the buildings aren't there anymore. This drip track area, this whole area, if you're facing it, you know the little process building or where the Mitchell County Parks people are right there, then there's that fence that splits it right down the middle, all the soil has been cleaned up on this side and, of course, all this stuff has been removed, so it's a lot cleaner looking now. That's where those soccer fields are and that's where the RV park is now.

The impoundments were one area where there was some pretty heavy impacts. And then the drip tracks we talked about. As part of that, as we went through and did this remedial investigation, we found that there had been some increasing concentrations from the surficial aquifer which is that first aquifer just 5 feet below the soil, because you know everything's got shallow groundwater down here in Camilla. And then below that is some clay and then there's an intermediate aquifer below it. Well, what we found is, in some spots there are areas where there is contamination that probably has moved from the surficial down to the intermediate aquifer, and that's part of what we're going to be treating in this remedial action.

The cleanup levels are set based on what we think the future land use is going to be at the site, and what we believe it's going to be and have been advised by Mitchell County and the City of Camilla is that it's going to be recreational. They were talking about building a baseball field out there. Anything that's recreational, it's set up to be cleaned up to that level so it's safe. And it's set based on very conservative assumptions, and that assumption is that you stick a straw in the groundwater and you drink it. So it's a very stringent setup level because we know that no one is going to drink that groundwater there because you get city water that's perfectly clean, and no one is going to be drilling wells out there. And there will be a prohibition on drilling wells at that site.

This is kind of like a cross-section. If you look at it, the top 5 feet are the soils, then you have the shallow aquifer below, then you've got the intermediate aquifer below that, and this little sinkhole feature is set up to show where we think there's probably been some contamination that's gone from the shallow aquifer down to the intermediate aquifer.

And this is to go back and take a look at where these remedial goal exceedances are. The areas in red are where concentrations exceeded our standards. And this is right here, Bennett and Thomas right here. The Old Camilla Drum Site, you've got a few spots over there, and then down here on the south side of the site.

This is kind of an approximate map of the groundwater contamination in the surficial aquifer which is that first aquifer as you go down. You go down 5 feet of soil and then below that is the surficial aquifer. And then in that intermediate aquifer where are there fewer impacts, this is kind of an idea of where you've got contamination.

So what we looked at are a few different things when we considered the soil remedial options. We looked at excavation and ex-situ stabilization and solidification, which is kind of a big word meaning that we treat it outside, that we dig it up, take it outside the hole, and we use some sort of binding or chemical agent that locks it in together and we take it offsite. Then we also looked at excavation and onsite treatment with thermal recovery, and that's really nothing more than taking some dirt and heating it up and driving off the contamination that's in the dirt, because all these contaminants will vaporize. Of course, you do that in a controlled environment with an air pollution control device behind it. But the concept is you heat it up and you drive it off. The third soil remedial option that we considered was in-situ stabilization and solidification. What that is, is you treat the dirt where it is. You insert and inject either concrete or grout or some other agent that basically freezes the soil contamination so it can't leave. That's what stabilization and solidification is in-situ.

MR. BENTKOWSKI: Not freezing like temperature freezing.

MR. MILLER: Yeah, not freezing - I'm sorry. It's not temperature based. It's just how you see concrete react and it stiffens everything and then you can't move it again. That's why pouring cement is one of the things that we consider when we look at doing a solidification. We haven't decided what agent we'll use to do solidification yet because we still have to do a test of that. Right, Kevin?

MR. BROWN: Right.

MR. MILLER: With respect to groundwater, we considered multiple options. In the surficial aquifer we considered containment, and that's where you basically - it's nothing more than what it says. You take a barrier wall, put it around there, and you tie it into the clay down below, and then you wait for it to attenuate. That way you keep the groundwater from coming into contact with anybody or anything until such time as nature takes it down to below that level, that maximum contaminant level. We also considered solidifying that surficial aquifer, which, once again, is just taking a binding agent, combining it with that surficial aquifer sands, and tying it in place. Then we also considered surficial aquifer compression grouting in those leaky areas where we've got contamination that's going from the surficial down to the intermediate aquifer. As we find those - we don't know where all those are yet. We know where two of them are, but we suspect that there are more areas like that there. So as we dig it out to implement other remediation, we kind of stumble on these things, just like when you're digging in your yard you stumble on bricks and stuff that have been buried there from when it was built. The intermediate aquifer we've considered moderate natural attenuation, which is nothing more than letting Mother Nature and bacteria take those concentrations down to a safe level. And over time at this site there's actually been natural attenuation that's taken place and cut contamination by up to two-thirds in some spots, and that's nothing more than bacteria just coming up and eating that stuff. Right, Ben?

MR. BENTKOWSKI: That's true.

MR. MILLER: We also considered in-situ chemical oxidation. And what that is - I don't know if you remember, or if you had chemistry in high school, but they gave you these beakers and they made you put two liquids together and it made a solid. Do y'all remember that? That's about the only thing I remember from that class, was how neat it was to see two liquids poured together and then it was a solid rock. That's what this is. They take an oxidant and they add it to the junk, and then the junk and the oxidant turn into an insoluble rock and drop out.

The other thing that was also under consideration is bio-stimulation, which is nothing more than injecting into the groundwater something that encourages this bacteria to grow and eat this contamination, because it's already set up to do it. It's in a situation where the aquifer is already - it's reducing the contaminants, but you just kind of help

Mother Nature along the way by encouraging the bacteria to grow.

We did cost comparison site-wide. You can take a look there. We basically kind of combined those in different ways, and what we came up with as a preferred alternative was S5 and GW2. I know you saw that in your handout, but we want to go over it a little bit more this evening, just kind of give you our thought process behind it and get your ideas as well.

We spread and pre-grade the onsite cap soil pile. Y'all may remember, if you've looked over there, you kind of see a soil pile right there just a little to the east of Thomas Street, just south of Bennett Street, and it's got a - it's a little bit unnatural because it's a little bit hilly for Camilla; right? It kind of does this a little bit, about 18 inches. Well, that's where they took - They took the dirtiest soil from over at the soccer field and took it offsite, and the stuff that was more clean they put underneath this cap and said, "You guys take care of this so we can go ahead and get to enjoying this field over here," and they put a cap over it, which is fine. But we need to address it for the long-term on that side of that site. So what we would do is spread that out and solidify it. And that highly contaminated source area which is where those impoundments were, right up here, we're going to do in-situ stabilization down to 5 feet, which is basically solidify all that soil in place, from the top all the way down to the top of the surficial aquifer. And then those areas outside, like here, would have fewer impacts, but they're still over our remedial goals, we're going to do solidification to 2 feet there. And what we were thinking is, because we're going to be doing solidification and we're going to be reducing the permeable area, it won't take the water down anymore. That's kind of the idea, is you don't want to take that water down anymore. You want that water to not go across it so there's no leaching of contamination. What we were thinking of doing was, we knew we were going to have to need some sort of storm water improvements because we're going to be taking area out and we know that there's been flooding on that site forever, and we understand that there may have been some flooding down here earlier this year.

UNIDENTIFIED FEMALE: It was a mess in my yard and my house, in the same area. And it smelled bad, too.

MR. MILLER: You smelled it, too?

UNIDENTIFIED FEMALE: Oh, yeah, awful.

MR. MILLER: We did hear from the city on that, and what they had asked about was the possibility of having some kind of holding pond. We need a storm water improvement anyway for this site, so we can probably build one down here, based on what the city wants to do. Now, this is the city's land right here, so we would be discussing it with them, but they've already approached us about doing something about that.

UNIDENTIFIED FEMALE: They said they want a holding pond?

MR. MILLER: Yes, ma'am.

UNIDENTIFIED FEMALE: But when it rains like that, it floods. When they get all that rain, they said something about there was a pond back over there somewhere.

UNIDENTIFIED FEMALE: There's a bond back there.

UNIDENTIFIED FEMALE: All that water floods over there in our neighborhood and it flooded my whole house inside.

MR. MILLER: Okay, I'm sorry.

UNIDENTIFIED FEMALE: It was stinking.

UNIDENTIFIED FEMALE: I live right off Bennett Street, on the next street over.

MR. MILLER: This is Bennett. Do you live north -

UNIDENTIFIED FEMALE: I'm on the next street over from Bennett.

UNIDENTIFIED FEMALE: Woodland.

UNIDENTIFIED FEMALE: Like this is Bennett, and it's in between Bennett and Cochran Street.

MR. MILLER: Okay. What this would be designed to do is to take water from here and put down in here and it's - We're in a situation where I think we preliminarily think we can do about a seven million gallon pond down there. But we do need to talk to the city about that, talk to them about how that gets done. That's one of the items we're thinking of this evening and we'd like to hear your comments on that.

So then we talked about that, so then what we were thinking about - and you see that at the bottom, storm water improvements to offset that reduction. What we were thinking about specifically was that storm water pond right there.

UNIDENTIFIED FEMALE: Okay, that water, it flowed over to her house, and they have two big ditches in front of her house and some more neighbors, and all the water come over toward my way. And that's Lincoln Street.

MR. MILLER: That's Lincoln Street; okay. So how did - I know it's hard to see when water's just everywhere. Do you know how -

UNIDENTIFIED FEMALE: Well, see, once it was raining it was all right, but it looked like somebody turned over water about five minutes later.

UNIDENTIFIED FEMALE: You couldn't even see the yard.

UNIDENTIFIED FEMALE: You couldn't even see the yard.

UNIDENTIFIED FEMALE: It was coming from over in that area.

MR. MILLER: So you think it was coming off the site area, in that direction?

UNIDENTIFIED FEMALE: That's right.

UNIDENTIFIED FEMALE: Coming off the site area.

MR. MILLER: Okay, because it's so flat over there, I mean, I guess it's five feet elevation across that whole site, and in the neighborhood there's not a lot of elevation; right?

UNIDENTIFIED FEMALE: Right. And the water, I mean, it was high.

MR. MILLER: That high?

UNIDENTIFIED FEMALE: It was high.

MR. MILLER: Four feet high?

UNIDENTIFIED FEMALE: Yeah, it was high.

MR. MILLER: Wow.

UNIDENTIFIED FEMALE: The city had to bring sand bags. It still didn't do no good, it still got in the house.

MR. MILLER: Well, that's part of what we're talking about tonight is how we can take the impact off, whether it came from the site or not.

UNIDENTIFIED FEMALE: It got flooded over there, too. They put sand bags around that building over there, too.

MR. MILLER: Oh, really?

UNIDENTIFIED FEMALE: Uh-huh (yes).

MR. MILLER: So this is one way to address that, is to be able to direct that flow out of the neighborhood and down on that site. And they have a lot of flexibility because they are the property owners now. They took that site over. They foreclosed some tax liens. I guess the people that owned the old wood preserving place owed city taxes for a long time back. Okay, very good, thanks for bringing that up.

I think it was Mr. Charles that you talked to at the city?

UNIDENTIFIED MALE: Mr. Kelly.

MR. MILLER: Mr. Kelly; okay. We'll get with him on that, for sure. To continue on, we were considering using a vertical barrier wall in the surficial aquifer. That's down below, so that's trapping that contaminated groundwater so it can't leak, until it attenuates. Then we're going to do compression grouting in the vicinity of those areas where we know that there's contamination getting down from the surficial aquifer to the intermediate aquifer. And then we're going to do in-situ chemical oxidation and bio-stimulation in the intermediate aquifer where there are fewer effects down there.

We've talked about storm water improvements. We haven't got specifics other than this is just thinking off the top of our heads, back of the envelope calculations where we might could put it. But we will get with the city on that, for sure.

MS. GAYNOR: To clarify, that's in addition to the pond that's already there. That pond will still be there. They're going to add another seven million gallons to handle more water. So that's what he's trying to say, is that even though there's a pond there, that's obviously not helping because it's flooding. They're going to put in a new one that can potentially hold up to seven million more gallons than is already there. I think part of the key would be to helping grading, when they're working out there, grading to make sure the water is going towards the pond and not towards you. So that, you know, is part of the rest of the - you know, he said they're going to be doing stuff with the soil. That maybe something that they might need to consider, to making sure that the slope, as slight as it may be, be towards that new pond rather than, you know, things going towards you guys. That's what they need, you know, that would be something that should be considered. That's what you're looking for.

UNIDENTIFIED FEMALE: Yeah, that's what I'm looking for so I don't have to -

MS. GAYNOR: You don't want your house flooded.

UNIDENTIFIED FEMALE: I don't want to do all that, have the house flood all over again, and it won't have to come out of my pocket.

UNIDENTIFIED FEMALE: Because the insurance won't pay for it.

UNIDENTIFIED FEMALE: The insurance don't pay unless you got flood insurance and they say that's not a flood area. But then when it flooded, they said they couldn't do nothing about it because we didn't have no flood insurance. But see, when we bought those houses they didn't say nothing about a flood area. So the money had to come out of our pocket to redo our house over.

MR. MILLER: Wow, that's rough.

UNIDENTIFIED FEMALE: It is.

MR. MILLER: I'm sorry to hear that.

UNIDENTIFIED FEMALE: And that ditch over there in front of it is awful. Everything's coming up out of there.

MR. MILLER: By that do you mean that -

UNIDENTIFIED FEMALE: When I was cleaning up, I had bad headaches from all that smell. Looks like I just can't get rid of them. It smelled awful that morning I got up. When I got up I said, "That smells so awful." I just had to lay down, go around to my mama's house and lay down, 'cause it was just smelling.

MR. MILLER: Yeah, it smells.

UNIDENTIFIED FEMALE: Awful, uh-huh (yes).

MR. MILLER: So you're talking about the pond that was at the back was backing up?

UNIDENTIFIED FEMALE: Uh-huh (yes).

MR. MILLER: Okay, so that one that's a city pond down there was backing up over the whole thing.

UNIDENTIFIED FEMALE: It was backing up. Bennett Street was flooded and Woodland Drive was flooded.

MR. MILLER: Okay, thank you for making that clarification, Penny. We're not going to take anything away, we'd only be adding to what the existing capacity is. So, we talked about what our preferred alternative is. That slide didn't come out well.

MS. BENTKOWSKI: Do you still have the last one, the last two?

MR. MILLER: We pay you to do that? Institutional controls will be required and we talked about what that means. In this case it means there'll be no - you won't be allowed to drill for groundwater there. You won't be allowed to disturb the area, so once things get in there, people aren't poking at things and taking water out of the ground over there. And you do that by basically putting a deed control in place that says thou shalt do this stuff. It's kind of a little more lawyerly than sciencey, but it prevents people from doing certain things. It also would prevent people from building residences on that property.

Then we would do five-year reviews and what that is, is basically looking at the remedy every five years once it's been put in place to make sure that it's functioning as it was intended, and if it's not, then we have to change it.

And that total cost would be thirteen million dollars.

And so, preferred alternative, we do solidification to five feet here, to two feet here and over here, we do compression grouting, sealing those holes between the surficial and the intermediate aquifer in these areas and anywhere else we found as we did more sampling as we got further into it.

The storm water improvements, we would hope to be putting some pond here. We've kind of done a back of the envelope calculation we could do seven million gallons there, but it's going to kind of depend on how the city wants to go with that because that technically is there property right there. We look forward to talking to them about it, and they've already been - they've called us and talked to us about it. And we wanted to assure them that it's their site, so we want to work with them to get what they need out there.

The way that EPA evaluates remedies is we look at - first we want to make sure that we're protecting human health and the environment and that we're complying with other environmental regulations that are for the site. We also look at the long-term effectiveness and permanence, the short-term effectiveness, reducing toxicity/mobility and volume through treatment. We look at state acceptance, that's from the EPD folks, and community acceptance.

So the next steps after tonight's meeting, we're going to take your comments back. Obviously we need to talk to the city about a fair number of things with respect to storm water management out at the site. Then we come up with a responsiveness summary based on the information that we're provided. People give us comments, written or oral comments, and then we respond to those in writing. Then we come up with a Record of Decision which, once again, is just what the agency is going to do to address the contamination out there for the long-term. We expect remedial design to begin immediately after the Record of Decision is published. We predict that that will by September 30th of this year. We think it'll take us up to a year to do a remedial design out there, and then we'll be in construction in the 2010 to 2011 period. It should take us six to eighteen months out there.

Does anybody have any questions or comments this evening?

MS. MILLER: For the court reporter, too, if you do have a comment or a question, if you could say your name before so we can have that on record, too, before you ask your question or your comment.

MS. WALLACE: I'm Claretha Wallace. The water that we are drinking, does it come from that city tank over there from that site, or where do the water come from that we're drinking?

MR. MILLER: I think the water comes, where you're drinking from, comes from a mile the other direction. There's a well that's over past the high school there on the other side.

MR. BENTKOWSKI: There's a green building, a small building about the size of this room, a little smaller than this room, and it's to the northeast, across the railroad tracks, across the football field, and on that next street over to the east. And in talking to the people with the city, they have a series of wells that they pump one well for awhile, then they pump another well and let that other recover. So there's a network of wells, but the closest one is in that green building to the northeast of the site. There's not a well near the water tank that's on the south end of the property.

MS. WALLACE: Well, referring to all this contamination and all, is that water that we're drinking, is it any way contaminated? That's what I'm worried about.

MR. MILLER: As far as we know it is not because it's drawn out away from the site and none of the contamination has left the site in that direction. One of the things that you do get, or you should get every year with your water bill - Do they do it twice a year or once a year?

MR. BENTKOWSKI: I think it's an annual report.

MR. MILLER: They're supposed to send out to you, and I'm sure they did it here, a listing. They have to test this water on a routine basis.

MS. WALLACE: They don't send us nothing.

UNIDENTIFIED FEMALE: You don't send us nothing, nothing.

MS. WALLACE: Uh-uh (no), they don't send nothing.

MS. MILLER: You could probably request that.

MR. MILLER: Or we could request it and get it.

MS. GAYNOR: They have to have it.

UNIDENTIFIED MALE: Yeah, they have to do it annually. I live in Dekalb County and it's in one water bill every year.

UNIDENTIFIED FEMALE: The only thing we get is a light bill. We don't get nothing else.

MS. WALLACE: The water bill is in with the light bill, and I've been there twenty-three years and I've never gotten anything about no testing the water.

UNIDENTIFIED MALE: It's just in the last maybe four or five years that that's been a legal requirement.

MS. GAYNOR: That they're required to send it out. They have to have it, but they may not have had to send it.

UNIDENTIFIED FEMALE: They don't send it now and I've been there twenty years, and they don't send it out.

MS. GAYNOR: Is this the City of Camilla or is it

Mitchell County?

UNIDENTIFIED FEMALE: City of Camilla.

UNIDENTIFIED MALE: Scott, can you put the aerial photo back up again?

UNIDENTIFIED MALE: One of the first things EPA does when it gets involved in one of these sites is we look and see where peoples' water is coming from to see whether it's possible that a site may be impacting your drinking water. In this case the nearest well, as Ben was saying, is upgrading, so it's in the uphill direction from where the contaminated water is. So there's no chance that the site is impacting your water supply. As Scott indicated or, I guess indicating, he's had conversations with the City of Camilla and they do do the testing, and there's not contamination in your water.

MS. WALLACE: They do the test?

UNIDENTIFIED MALE: Yes, ma'am.

MS. WALLACE: Well, they don't tell us about nothing.

UNIDENTIFIED MALE: And I'm not sure what's going on with the reports, but they do the testing.

MS. WALLACE: They don't tell us anything about it.

UNIDENTIFIED MALE: We'll help you figure that out.

MR. MILLER: We'll get them and send it to you then. You want to see them? You want us to just send it to everybody on the mailing list?

UNIDENTIFIED FEMALE: Yeah, send it. I have a house stay right over there by - the house that's next door to me, and this man, he used to stay there. They have well problems. The city used to have to come and pump his well. And it's still got a hole there in that house and you can smell the scent that's coming from out of that house. And it's there now.

MR. MILLER: Can you tell me the address?

UNIDENTIFIED FEMALE: I don't know the exact address, but my house number is 226 Lincoln Street. But it's boarded up. They got the house boarded up now. And the city used to have to come there and pump it out. I couldn't even open my back door.

MR. MILLER: So they pumped his well for him?

UNIDENTIFIED FEMALE: Uh-huh (yes).

MS. GAYNOR: But as far as you know that well has not been closed, or there's a whole that you think is still the well?

UNIDENTIFIED FEMALE: Yeah, 'cause they got brick, block stuff on top of it.

MR. BROWN: Scott?

MR. MILLER: Yeah.

MR. BROWN: I just want to maybe help out on answering that question. The railroad tracks, we have monitoring wells on the east side of the railroad track which is between the site and the drinking water well, and we've sampled those multiple times since we've been involved in 2006, and they were sampled prior to that in '99, 2004, and no contamination has ever been found on the eastern side of the railroad tracks in the intermediate aquifer. And they're directly between the site and the drinking water wells, so those wells have always been clean.

MS. GAYNOR: And, Kevin, those wells are shallower than the city wells?

MR. BROWN: They are much shallower, yes.

MS. GAYNOR: The city well is much deeper, and what you normally would find was that if you found it clean shallower, it wouldn't get down to the deeper. The deeper you go is usually safer. I mean, that's part of the reason why they make them that deep, and there's more water, but that's one of the reasons why they do that.

UNIDENTIFIED MALE: The well that y'all dug, how often do y'all test the water in there? The different wells that y'all dug at different locations, how often is the water being tested?

MR. MILLER: I've guess we've tested it about once every six months if it's on the site, and they're going to be testing them again here shortly.

MR. BROWN: Yeah, we will be testing those again. And part of the remedial design plan and the implementation is an ongoing monitoring program to monitor those wells over time.

UNIDENTIFIED FEMALE: Who tests the wells?

MR. BROWN: We have the contract done with Black & Veatch. I work for EPA, so people from my company test those wells. We send those to an EPA approved lab and the samples are analyzed.

UNIDENTIFIED FEMALE: That's the same with the soil?

MR. BROWN: Yes, ma'am.

UNIDENTIFIED FEMALE: I work at a soil lab. That's why I was wondering.

MR. MILLER: Okay.

UNIDENTIFIED FEMALE: How often do y'all test the soil, since y'all are talking about an RV.

MR. MILLER: Well, we tested the soil on that side of the site and found it to be clean in that area of the site. And in the area of the site north, where the soccer fields are now, where it wasn't clean, they removed it and put some on the side and they took some off to the landfill. So the last time that soil was tested was in 2006.

UNIDENTIFIED FEMALE: And when y'all start doing like the RV and all, will y'all be testing it periodically?

MR. MILLER: Typically, once you, like, remove the source of contamination, which in this case, those were where all of those pole barns were and everything, so it was all the timber sitting out there leaking into it, once you test it and it's tested clean, since there's no source left, we probably wouldn't test it again over there unless they ran into something. We thought they put the slab out there, but we were out there today and they still haven't put that slab up. That'll be like a barrier over the soil there. I guess the thinking being so you can pull your RV out there. Those are pretty heavy things. We assume they're going to pave that, that road back there.

MS. MILLER: So, Scott, we're pretty much done with that side, right, I mean that side is done?

*MR. MILLER: We're pretty much done with that side, uh-*huh (yes).

UNIDENTIFIED FEMALE: So that's the side where the holding pond's at, the holding pond that they already got over there?

MR. MILLER: That's that side, yes, ma'am.

UNIDENTIFIED FEMALE: So on Lincoln Street, it's okay?

UNIDENTIFIED FEMALE: I ain't seen no pond. That must be behind those trees. It must be behind the trees.

UNIDENTIFIED FEMALE: Lincoln Street.

MR. MILLER: Can you show me Lincoln Street?

MR. BENTKOWSKI: Scott, Jim's got it right here.

MR. McNAMARA: Lincoln Street's right there. It's straight up north from that yellow and black square at the northeast corner.

UNIDENTIFIED FEMALE: That's Bennett Street and Lincoln is right there in front of it.

MR. MILLER: So Bennett's here and then Lincoln's right there?

UNIDENTIFIED FEMALE: And Lincoln's right in front, uh-huh (yes).

MR. MILLER: As far as we know, we've tested the soil and the water out there and it's in good shape. Do you want us to send you those results?

UNIDENTIFIED FEMALE: Yeah, I'd appreciate it.

MR. MILLER: Just send it to everybody?

UNIDENTIFIED FEMALE: Uh-huh (yes).

UNIDENTIFIED FEMALE: Woodland Drive.

MR. MILLER: And Whitland Drive?

UNIDENTIFIED FEMALE: Right.

MR. MILLER: Is that with one T or two T's?

UNIDENTIFIED FEMALE: No, Woodland.

UNIDENTIFIED FEMALE: Woodland.

MR. MILLER: Woodland, okay.

UNIDENTIFIED FEMALE: The only thing we was looking at was Singleton Street, Thomas Street and Bennett Street, and they didn't mention nothing about -

MS. WALLACE: Because I looked at the drawing here and I couldn't see Lincoln.

UNIDENTIFIED FEMALE: I couldn't see Lincoln, Davis either, Cochran.

MS. WALLACE: Lincoln Street come out right where the aerobics - where they talking about - where you turn up in there.

UNIDENTIFIED FEMALE: Right, that's Lincoln there.

MS. WALLACE: That go directly into there. When you pull out of there, you're pulling on Lincoln. When you pull out of that site, you're pulling on Lincoln.

MR. MILLER: Where that little wood building is on the site, where you pull straight out, that's Lincoln Street?

MS. WALLACE: When you go straight out, that's Lincoln Street.

MR. MILLER: Okay, we'll send you that information. Has anybody got anything else this evening? We appreciate you coming out. That's why we do this.

MS. MILLER: And I've got some business cards here, or my name and number and Scott's name and number is in the proposed plan that y'all received. So don't ever hesitate to call us if you have a question. Something always come up after the meeting, but don't hesitate. You've got until September 10th. If you think of something else tonight that you want to go on record as a comment, or if you have a question, don't hesitate to call us so we can put that in the record.

UNIDENTIFIED FEMALE: Who do we need to see about that ditch?

UNIDENTIFIED FEMALE: It's right in front of my house.

MR. MILLER: Let me make sure I understand the specific ditch. It's the one that's on the back side of that property?

UNIDENTIFIED FEMALE: No, on Lincoln Street.

MR. MILLER: Oh, on Lincoln Street?

UNIDENTIFIED FEMALE: On Lincoln Street.

MR. MILLER: Who's in charge of the storm water in -

MS. GAYNOR: The City of Camilla.

MR. MILLER: Is it the city or is it the county?

UNIDENTIFIED FEMALE: It's the city.

UNIDENTIFIED MALE: That's city limits. But that may drain. That may be set to drain all the way down to the one that's out there in the back. It depends on what their network is set up like.

MR. MILLER: I think they're worried about some backup right now.

UNIDENTIFIED FEMALE: That's right.

MR. MILLER: So, I guess, is it Mr. Charles Kelly?

UNIDENTIFIED MALE: The city engineer.

MR. BROWN: I think he's over zoning. I'm not sure if he's the actual responsible person. I was speaking with someone else who knows him tonight. I think he's over zoning, but there might be someone else who's there.

UNIDENTIFIED FEMALE: If it rains all day long, we're going to be flooded again, can't even walk out in my yard.

UNIDENTIFIED FEMALE: And it already don't work, running out the floor of my daughter's house.

UNIDENTIFIED MALE: It would be the city, where I would start. Obviously we don't know for sure who's responsible there, if it's city or county. It's a local government matter. What we're going to do for our part is make sure that the work we do, you know, we expect it to improve the drainage in the area and we will coordinate all of our work *with them to make sure that at a minimum it doesn't make* anything any worse. But, you know, in the short-term we can try to find out who the right contact is for you. I think Camilla is a fairly small city, so you might just call City Hall and ask them who takes care of that. It could be anything, you know, they've got a clog somewhere in a pipe. I don't know what's going on.

UNIDENTIFIED FEMALE: That's every time it rains.

UNIDENTIFIED MALE: Call Mike Larkin, the City Manager; 336-2222.

UNIDENTIFIED FEMALE: Okay. Every time it rains that ditch be full with water and those apartments, all that water goes toward those apartments and our houses.

MS. MILLER: What's his last name?

UNIDENTIFIED MALE: Larkin, L-A-R-K-I-N.

MS. MILLER: He's the city manager?

UNIDENTIFIED MALE: Yeah.

UNIDENTIFIED FEMALE: When you got a holding pond the water's supposed to go into the holding pond. That's where it's supposed to go.

UNIDENTIFIED FEMALE: The holding pond come over to our house.

UNIDENTIFIED FEMALE: See, they closed up the ditch over there on Thomas Street, but they didn't close up the ditch on Lincoln Street.

MR. MILLER: And that just may strictly be a matter of letting them know what's going on and they can take care of it.

UNIDENTIFIED FEMALE: They already know. They already know. They just don't do nothing about it. They already know.

MS. MILLER: Did y'all have any questions or concerns? Okay, if there's nothing else, thank y'all so much for coming out tonight.

(Hearing concluded at 7:31 p.m.)

C E R T I F I C A T E

STATE OF GEORGIA

COUNTY OF DOUGHERTY

I, Norma A. Wilson, Deposition Officer, being a Certified Court Reporter and Notary Public in and for the State of Georgia, and a nationally Certified Verbatim Reporter, certify that the foregoing transcript, consisting of 40 pages, is a true and complete record of the proceedings held at the aforementioned time and location; that I am neither a relative nor employee nor attorney nor counsel of any of the parties, nor a relative nor an employee of such attorney or counsel, nor financially interested in the action; and that the original transcript of said proceedings, under seal, shall be furnished to the United States Environmental Protection Agency.

WITNESS my hand seal at Albany, Dougherty County, Georgia, this 3rd day of September, 2009.

Norma A. Wilson

NORMA A. WILSON, CCR
License No. B-1777