FIVE-YEAR REVIEW REPORT FOR AMERICAN CREOSOTE WORKS (Jackson Plant) SUPERFUND SITE JACKSON, MADISON COUNTY, TN

Prepared by
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Prepared for
U.S. Environmental Protection Agency
Region 4
Atlanta, GA

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Superfund Division

8/7/14

Date

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LIST OF ACRONYMS

ACW	American Creosote Works, Inc.
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DNAPL	dense non-aqueous phase liquid
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
ICs	Institutional Controls
JEA	Jackson Energy Authority
LIF	laser induced fluorescence probe
MCL	Maximum Contaminant Level
mg/L	micrograms per liter
mg/kg	micrograms per kilogram
MIP	Membrane interface probe
MW	monitoring well
NAPL	non-aqueous phase liquid
NCP	National Contingency Plan
NPDES	National Pollution Discharge and Elimination System
NPL	National Priorities List
NRMRL	National Risk Management Research Laboratory
O&M	Operation and Maintenance
OU	Operable Unit
PAHs	polycyclic aromatic hydrocarbons
ppb	parts per billion
PCP	pentachlorophenol
PRB	permeable reactive barrier
PRGs	Preliminary Remediation Goals
PRP	Potentially Responsible Party
RAOs	Remedial Action Objectives
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
S/S	solidification/stabilization
SAIC	Science Applications International Corporation
SVOCs	semi-volatile organic compounds
TBCs	To-Be-Considered criteria
TDEC	Tennessee Department of Environment and Conservation
TDHE	Tennessee Department of Health and Environment
TDOR	Tennessee Division of Remediation
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

Introduction

The American Creosote Works (Jackson Plant) Superfund Site (the Site) is located in Jackson, Madison County, Tennessee. The approximately 60-acre Site was a wood-treatment plant that operated from the early-1930s until late-1981, when the operator filed for bankruptcy. The plant used creosote and pentachlorophenol (PCP) to preserve wood. Groundwater underlying the facility, on-site soils, surface water, and sediments were contaminated with volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and heavy metals from the wood-treating process.

The cleanup of the Site was organized into two operable units (OUs). OU1 consisted of surface cleanup activities and site stabilization. It was implemented to eliminate hazardous conditions at the Site, protect the river, and control access to the Site. The OU1 Record of Decision (ROD) was signed on January 5, 1989. EPA issued an Explanation of Significant Differences (ESD) in September 1993 to document actual OU1 activities and deviations from ROD requirements, effectively ending work on OU1. The OU2 ROD addressed the cleanup of the surface soils, the surface waters, sediments, and the aquifers affected by the Site. The OU2 cleanup measures were selected to protect human health and the environment and enable the Site's use for industrial purposes. The cleanup measures were designed to address the contaminated soils, sludge, sediments, free creosote, emulsion, debris, and impounded water at the Site. In addition, a monitoring plan for the treated soil area, Central Creek, South Fork of the Forked Deer River, and the Alluvial and Fort Pillow aquifers would be designed and implemented as part of the RA. The OU1 RA was completed on September 20, 1993. The OU2 ROD was signed in 1996 and the RA was completed in 2000. The triggering action for this Five-Year Review (FYR) was the signing of the previous FYR on July 21, 2004.

Remedies Selected

The 1989 ROD for OU1 stated the following as the selected remedy:

- deed restrictions limiting further use of the Site;
- construction of a flood protection dike around the site and site stabilization;
- removal and disposal of tanked liquids and sludge;
- removal and disposal of site structures; and
- installation of security fencing around the Site.

The 1993 ESD stated that all of the ROD requirements were met except that the deed restrictions were not in place by the time construction was complete. However, the remedial activities completed to date at the Site were protective of human health and the environment.

On September 30, 1996, EPA issued the Site's OU2 ROD, which concluded that the Site would continue to be used as an industrial property. The OU2 ROD stated that the main objectives of

the Site's remediation were to:

- mitigate potential health hazards due to incidental soil ingestion, dermal contact, and dust inhalation by current trespassers and future workers at the Site;
- protect the Alluvial and Fort Pillow aquifers, Central Creek, the South Fork of the Forked Deer River, and sediments impacted by the Site; and
- maintain the Site as an industrial property that will not pose a significant threat to human health or the environment.

The OU2 ROD also concluded that while there was no evidence of groundwater contamination outside the Site's boundaries, site groundwater required a long-term monitoring program that would evaluate the immobilized waste for integrity, and assess the effectiveness of natural attenuation of the remaining contaminants in the groundwater, the surface waters, and sediments. The OU2 ROD specified a remedy which called for:

- removal and off-site disposal of liquid waste;
- solidification/stabilization (S/S) of contaminated soil;
- land use restrictions; and
- monitoring.

Technical Assessment

The review of documents, risk assumptions, and the site inspection indicate that the remedy is functioning as intended by the 1989 and 1996 RODs. The Site was stabilized during the OU1 RA and the OU2 RA cleaned the surface soils to industrial use standards. Recent monitoring data suggests that migrating contaminated groundwater needs to be further investigated to ensure protection outside the Site boundary. Groundwater sampling results indicate that PCP-contaminated groundwater is moving off-site and may be affecting the adjacent Central Creek, the South Fork of the Forked Deer River, or both. The 1996 ROD estimated that the area and depth of the contaminated soil that required treatment were approximately 28 acres and two feet, respectively. Approximately 81,000 tons of contaminated surface soil, 520,000 gallons of contaminated water, and 16,000 gallons of creosote were processed during the OU2 RA. Treated soils were buried on-site, compacted, and capped in the Site's seven-acre backfill area.

On July 7, 2005, the Jackson Energy Authority (JEA) filed a Corrected Notice of Land Use Restrictions for the property with the Madison County Register of Deeds. The restrictions limit the property to industrial uses unless the Tennessee Department of Environment and Conservation (TDEC) grants permission for other uses. The land use restrictions specify that any invasive activity that could compromise the Site's remedy requires the prior approval of TDEC and prohibit soil borings or potable groundwater well construction on-site without TDEC's approval. Though not called for in the decision documents, further Site review may be needed to determine if institutional controls (ICs) are necessary to restrict use of groundwater on adjacent, private properties due to migration of contaminated groundwater from the Site.

The 1996 OU2 ROD called for the monitoring of surface water, sediments, and groundwater. Groundwater has been monitored several times since the last five year review to characterize the migrating groundwater contamination. The USGS also conducted a study of surface water and sediment in Central Creek and the South Fork of the Forked Deer River (SFFDR), finding

contamination in sediments along the western site boundary. Since the last five year review, all damaged and unnecessary wells have been repaired or properly abandoned. The site repository, which had been destroyed by flooding at the Jackson-Madison County Public Library, has been replaced. Several phases of investigation have been conducted to determine the nature and extent of groundwater contamination in the downgradient direction, and the potential for contaminants to leave the site by groundwater transport or the groundwater to surface water pathway.

Conclusion

The protectiveness of the Site remedy is currently categorized as "protectiveness deferred" for several reasons. First, the chemical vapor intrusion pathway needs to be assessed for onsite office buildings. The extent and levels of dioxin also needs to be reassessed in areas beyond the capped area of the site. Finally, the extent of potential impacts to groundwater and surface water and sediments also needs to be assessed. An OU3 Remedial Investigation and Feasibility Study (RI/FS) is planned for late-2014 to complete the assessment of the Site.

Surface water and contaminated groundwater are not being used for potable purposes, and contaminated surface soils were excavated, treated, and capped appropriately during the 1999 remedial action. ICs and zoning are in place to restrict the Site to industrial uses, prevent activities that would compromise the remedy, and prevent installation of groundwater wells. The off-site migration of contaminated groundwater is currently being evaluated and needs to be addressed, but it appears the surface water system in the site vicinity is acting as a hydraulic barrier to groundwater flow. There are currently no private wells on properties potentially affected by migrating contaminated groundwater. The nearest private well in the downgradient direction is over one mile away.

In order to ensure that the Site's remedy remains protective in the long-term, the following actions are recommended:

- Evaluate the chemical vapor intrusion pathway to ensure the protection of the onsite workers in the Dement Construction Company headquarters building;
- Complete the ongoing evaluation of contaminated groundwater and groundwater to surface water pathway to determine the potential for off-site migration of site contaminants, and sample surface water, groundwater, and sediments to monitor potential off-site groundwater contaminant migration;
- Re-assess dioxin levels beyond the capped area of the site;
- Determine if groundwater ICs are appropriate for adjacent properties.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: American Creosote Works, Inc. (Jackson Plant)		
EPA ID: TND007018799		
Region: 4	**State:** TN	**City/County:** Jackson, Madison

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:** Click here to enter text.
Author name (Federal or State Project Manager): Donnie A. Sprinkle
Author affiliation: TDEC-DOR
Review period: 01/01/2014 – 07/15/2014
Date of site inspection: 3/12/2014, 3/18/2014
Type of review: Statutory
Review number: 5
Triggering action date: 7/21/2009
Due date *(five years after triggering action date)*: 7/21/2014

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
Operable Unit 1, which dealt with the initial response at the site in 1989

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 2	Issue Category: Monitoring			
	Issue: Indoor air pathway has not been evaluated for chemical vapor intrusion in the recently-constructed office building on site. Off-property soils need to be reassessed for dioxin.			
	Recommendation: Conduct sampling to assess the indoor air pathway and evaluate off-property dioxin levels relative to current EPA dioxin criteria.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA	State	12/31/14

OU(s): 2	Issue Category: Changed Site Conditions			
	Issue: Contaminated groundwater is potentially moving off site.			
	Recommendation: Complete the ongoing evaluation of contaminated groundwater to address the potential effects of Site contaminants on off-site groundwater, the creek and river nearby.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	State	12/31/16

OU(s): 2	Issue Category: Institutional Controls			
	Issue: No groundwater use restrictions are on adjacent off-site properties.			
	Recommendation: Evaluate the need for ICs on adjacent, off-site properties.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	State	12/31/15

To add additional issues/recommendations here, copy and paste the above table as many times as necessary to document all issues/recommendations identified in the FYR report.

Protectiveness Statement(s)
Include each individual OU protectiveness determination and statement. If you need to add more protectiveness determinations and statements for additional OUs, copy and paste the table below as many times as necessary to complete for each OU evaluated in the FYR report.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Operable Unit 1	Protective	Click here to enter date.
Protectiveness Statement: The remedy implemented under this operable unit was accomplished between January 1989 and August 1991. Tasks under this remedy included installation of a security fence around the site, building a flood protection levee, removal and treatment of tanked liquid and sludge, and the demolition of site structures, buildings, and equipment determined to constitute an immediate hazard.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Operable Unit 2	Protectiveness Deferred	Click here to enter date.
Protectiveness Statement: The Site's OU2 remedy is currently categorized as "protectiveness deferred" due to the need for chemical vapor intrusion sampling in the onsite office building and dioxin reassessment of off-property soils. These sampling needs are to be met during an anticipated Remedial Investigation that is in the planning stages for late 2014. Surface water and contaminated groundwater are not being used for potable purposes, and contaminated surface soils were excavated, treated, and capped appropriately during the 1999 remedial action. ICs and zoning are in place to restrict the Site to industrial uses, prevent activities that would compromise the remedy, and prevent installation of groundwater wells. The off-site migration of contaminated groundwater is currently being evaluated and needs to be addressed, but it appears the surface water system in the site vicinity is acting as a hydraulic barrier to groundwater flow. There are currently no private wells on properties potentially affected by migrating contaminated groundwater. The nearest private well in the downgradient direction is over one mile away.		

Sitewide Protectiveness Statement (if applicable)	
For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.	
Protectiveness Determination: Protectiveness Deferred	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The Site's remedy is currently categorized as "protectiveness deferred" due to the need for chemical vapor intrusion sampling in the onsite office building, and also the need to evaluate the risk of dioxins in surface soil outside the capped area. These sampling needs are to be met during an anticipated Remedial Investigation that is in the planning stages for late 2014. Surface water and contaminated groundwater are not being used for potable purposes, and contaminated surface soils were excavated, treated, and capped appropriately during the 1999 remedial action. ICs and zoning are in place to restrict the Site to industrial uses, prevent activities that would compromise the remedy, and prevent installation of groundwater wells. The off-site migration of contaminated groundwater is currently being evaluated and needs to be addressed, but it appears the surface water system in the site vicinity is acting as a hydraulic barrier to groundwater flow. There are currently no private wells on properties potentially affected by migrating contaminated groundwater. The nearest private well in the downgradient direction is over one mile away. In order to ensure that the Site's remedy remains protective in the long-term, the following actions are recommended:• Determine if groundwater ICs are appropriate for adjacent properties; •Complete the ongoing evaluation of contaminated groundwater and groundwater to surface water pathway to determine the potential for off-site migration of site contaminants, and sample surface water, groundwater, and sediments to monitor potential off-site groundwater contaminant migration. •Evaluate the chemical vapor intrusion pathway to ensure the protection of the onsite workers in the Dement Construction Company headquarters building. Reassess the dioxin issue using updated screening levels.	

Fifth Five-Year Review Report
For the
American Creosote Works (Jackson Plant) Superfund Site

1.0 Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of FYRs are documented in five-year review reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action."

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation, conducted this FYR between December 2013 and July 2014 and prepared this report. TDEC is the lead agency for developing and implementing the remedy for the Superfund-financed cleanup at the Site. TDEC has reviewed all supporting documents and provided input to EPA during the FYR process.

This is the fifth FYR for the Site. It is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. Under current conditions at the Site, potential or actual human exposures are under control. The triggering action for the review is the signing of the fourth FYR, which occurred on July 21, 2009. The Site cleanup was conducted under two Operable Units (OUs), both of which are evaluated in this report.

2.0 Site Chronology

The following table lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Discovery	August 1980
State officials begin enforcement action and site sampling	November 1981
State issues National Pollution Discharge and Elimination System (NPDES) permit to American Creosote Works, Inc.	December 1981
American Creosote Works, Inc. stops wood preserving operations	December 1981
American Creosote Works, Inc. files for Chapter 11 bankruptcy	May 1982
EPA conducts site reconnaissance	March 1983
EPA initiates sampling and emergency removal actions	June 3, 1983
OU1 Remedial Investigation (RI) / Feasibility Study (FS) starts	October 30, 1985
Site listing on National Priorities List	June 10, 1986
Sitewide Removal Action starts	October 10, 1988
OU1 Record of Decision (ROD) signature and RI/FS completed	January 5, 1989
OU1 Remedial Action (RA) starts	January 1989
OU1 RA Superfund-State Contract signed	May 1989
Sitewide Removal completed	July 31, 1989
OU2 RI/FS started	December 29, 1989
Support Agency Cooperative Agreement signed	April 1993
OU1 Explanation of Significant Differences (ESD) issued	September 17, 1993
OU1 RA completed	September 20, 1993
First OU1 FYR signed	January 25, 1995
OU2 RI/FS completed and OU2 ROD signature	September 30, 1996
OU2 Treatability studies/RD conducted	October 1996 - September 1997
EPA approves and funds State-lead OU2 RA / OU2 RA construction	September 30, 1998
OU2 RA construction completed and Construction Complete / Preliminary Close-out Report issued	May 24, 2000
Groundwater monitoring begins	June 2000
Second OU1 FYR signed	September 28, 2000
Soil, groundwater, sediment, and surface water sampling	June 2004
Third Sitewide FYR signed	July 21, 2004
Site property sold to JEA	July 27, 2004
Groundwater sampling	December 2004
Soil, groundwater, sediment, and surface water sampling	March 2005
Deed restriction filed with Madison County Register of Deeds	July 7, 2005
Groundwater sampling	August 2005
Soil and groundwater sampling	January 2008
Permeable Reactive Barrier Design Work Plan	April 2008
Groundwater sampling	February 2009
Fourth Five Year Review signed	July 7, 2009
Vertical Flow Study	January 2012
Groundwater sampling	February 2012
Groundwater sampling	October 2012

3.0 Background

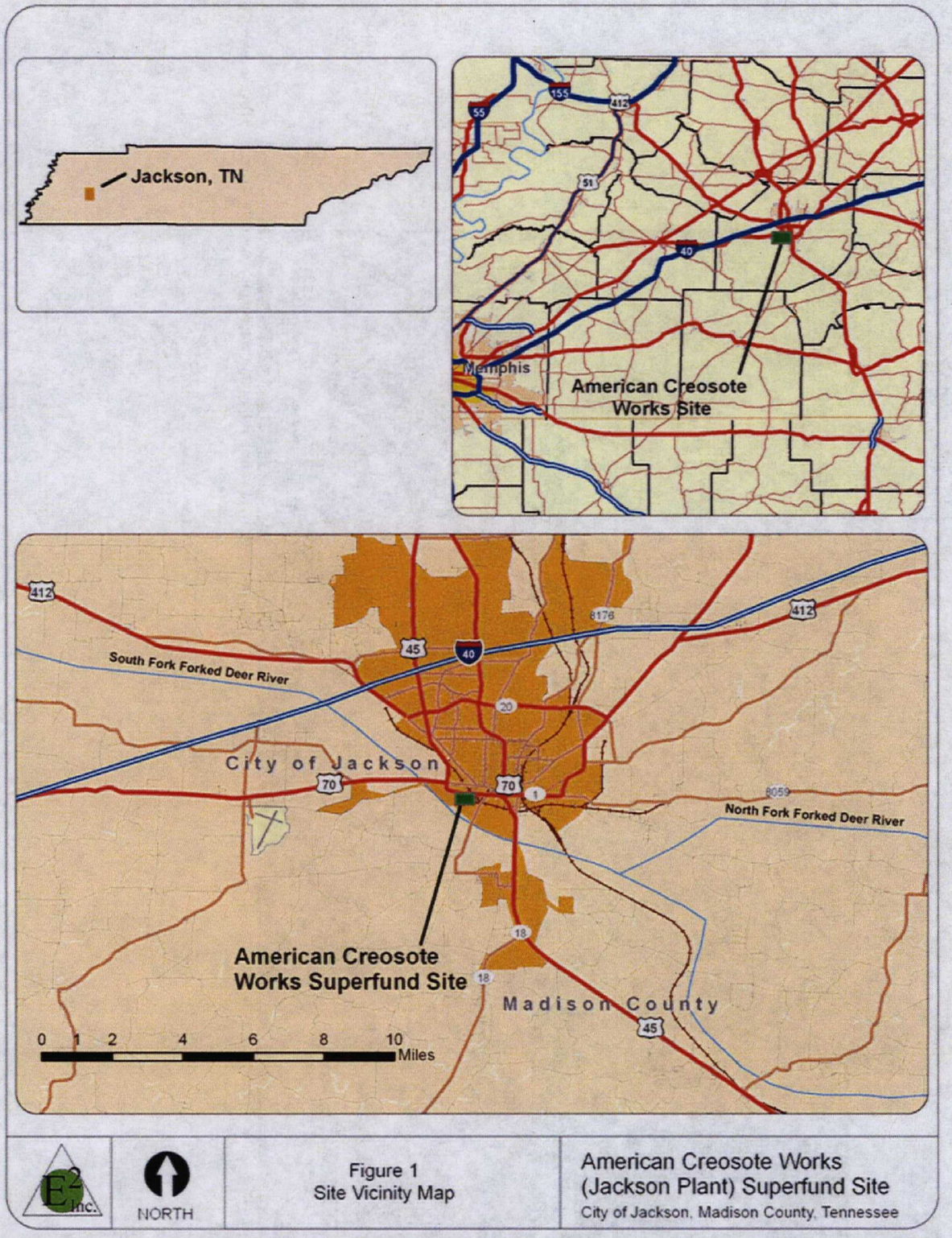
3.1 Physical Characteristics

The Site is an approximately 60-acre parcel of land located immediately southwest of downtown Jackson, in Madison County, Tennessee (Figure 1). It is bounded on the south by the Seaboard Railroad, on the southwest by the South Fork of the Forked Deer River, on the west and north by Central Creek, and on the east by an industrial yard.

The general area is characterized by a gently rolling topography with a maximum relief of approximately 100 feet and several marshy floodplains. Relief at the Site is about 20 feet and the topography includes numerous swales, lagoons, and other low-lying areas. The topography at the Site is relatively flat, sloping toward the Forked Deer River to the southwest. The topography over most of the Site has been altered by fill operations. The Site is bounded by a levee raised three-to-four feet above grade along the southern and western sides of the facility. A drainage culvert cut through the levee is located in the southwest corner of the Site. The drainage culvert flows (approximately 0.1 cubic feet per minute) for most of the year. The Site is enclosed by a chain-link fence (except for across the drainage culvert) and is used as an equipment storage area.

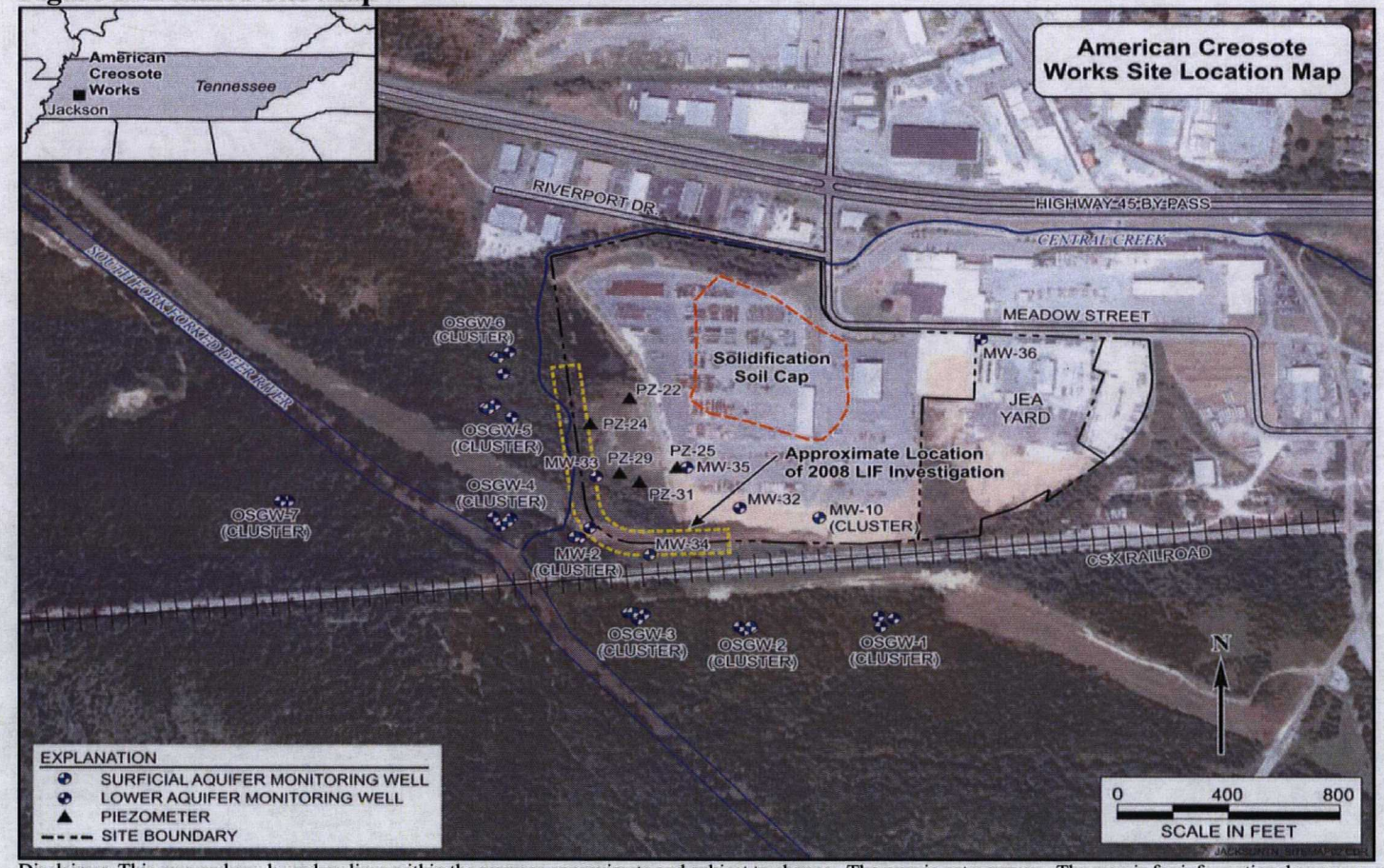
The aquifer underlying the Site is made up of an alluvial aquifer as well as the Fort Pillow and Porters Creek Clay formations. The uppermost hydrostratigraphic unit under the Site is composed of interbedded alluvial sands, silt, and clay. This unit acts as an upper partially confining aquitard in the vicinity of the Site. The clays are not continuous but grade from silty clays to clayey sands across the Site. Therefore, this unit only retards the vertical percolation of surface water into the underlying units. Streams and rivers entrenched in this unit may provide direct conduits to the underlying aquifer. The Fort Pillow aquifer consists predominantly of sands. The lower hydrostratigraphic unit at the Site is the Porters Creek Clay. This unit consists of silts and clays, which act as a lower confining aquitard for the sands of the Fort Pillow aquifer at the Site. Groundwater flow at the Site is generally in a northeast to southwest direction. It follows the slope of the Site's ground surface elevation and discharges into the South Fork of the Forked Deer River.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

3.2 Land and Resource Use

Land in the area of the Site is primarily used for industrial, commercial, and residential purposes. Natural resources include forests, pastures, surface water, groundwater, sand, and clay. Although the area is wooded, the trees are small in size and do not appear to be of timber grade. Sand has been mined from all accessible geologic formations in the local area and extensive Wilcox clay mining has been conducted near the Site.

The Site is located within an area drained by several major streams. The Site is within the floodplain of the South Fork of the Forked Deer River. The boundaries of the Site include dikes to the northwest, west, and southwest. Central Creek flows along the northern and western border of the Site. The dikes on the Site form one of the Creek's channel banks. Surface runoff flow is to the south and into the South Fork of the Forked Deer River, which is approximately 300 feet downstream of the Site. The South Fork of the Forked Deer River flows through Jackson, and is one of the principal rivers in Tennessee. It was once used for steamboat travel and has a drainage area of 495 square miles. The drainage area of Central Creek is approximately 1.1 square miles and includes industrial property, commercial property, and several residences.

All neighboring properties obtain water from the Jackson Energy Authority (JEA). The City of Jackson's south well field is located approximately 1 mile to the east of the Site, while groundwater flow is to the southwest. The nearest private well is on Boone Lane, approximately 6,500 feet to the southwest, in the downgradient direction from the Site.

The Site is in reuse as an equipment storage facility by property owners Dement Construction and the Jackson Energy Authority (JEA). The former site property was purchased by JEA at public auction in 2003, and in 2005, a portion of the property was sold to Dement Construction. Between 2006 and 2007, Dement Construction placed clean fill material over the entire site excluding the lagoons to upgrade the Site for use as an equipment yard. Dement Construction also constructed buildings on site, including an office building and maintenance/storage shed. The integrity of the cap has not been compromised due to the new buildings. Buildings built on the cap were built on floating slabs with minimal footings as recommended by USEPA and built on several feet of additional fill, which was required to comply with flood codes.

3.3 History of Contamination

The Site was an abandoned industrial facility that utilized creosote and pentachlorophenol (PCP) to preserve wood. American Creosote Works, Inc. (ACW) operated the facility from the early 1930s to December 1981. ACW filed for bankruptcy under Chapter 11 of the United States Bankruptcy Code in May 1982. Due to ACW's insolvency, it was not a financially-viable potentially responsible party (PRP), and no other viable PRPs were located. Thus, no PRPs have been involved in the remedial activities conducted at the Site.

Between the early 1930s and 1973, the plant discharged untreated process water on site with minimal control and routinely polluted the Forked Deer River. In 1973, a levee was

built around the facility to contain the wastewater and surface runoff. Between 1974 and 1975, the plant installed a wastewater treatment system and oil-water separators to control environmental pollution. Pits created during the construction of the levee were used to store treated process water and sludge, but the pits frequently overflowed during heavy rains, flooding the main process area, and releasing waste into the river.

3.4 Initial Response

Enforcement actions began at the Site in November 1981, when the Tennessee Department of Health and Environment (TDHE), presently TDEC, installed four monitoring wells around the property to assess the Site's impact on the environment and its potential effect on human health. In December 1981, the facility was issued a National Pollution Discharge Elimination System (NPDES) permit to allow discharge of storm water runoff from a site lagoon to Central Creek. In the same month, the plant closed down. The facility operator, ACW, filed for bankruptcy protection under Chapter 11 of the United States Bankruptcy Code in May 1982. During 1982 and 1983, TDEC conducted several inspections of the facility. All inspections resulted in citations for permit violations by the operator. Concurrently, TDEC collected environmental samples to evaluate the Site and concluded that human health and the environment were at risk due to site conditions. In consideration of the facility's conditions and the operator's insolvency, TDEC requested the assistance of EPA Region 4's emergency response group in June 1983.

In 1983, EPA inspected the Site and conducted environmental media sampling which confirmed TDEC's findings that the soil, surface water, sludge, and shallow subsurface water were contaminated by creosote and PCP. On June 3, 1983, EPA used CERCLA emergency response funds to treat and dispose of wastewater from the Site, and to remove, treat and bury sludge under the clay cap in a former lagoon area of the property. The waste removal activities were completed by August 12, 1983.

3.5 Basis for Taking Action

The Site was proposed for the National Priorities List (NPL) in October 1984 and finalized on the NPL in June 1986. In 1985, EPA approved an action memo to fund a RI/FS for the Site. The RI/FS was conducted by the U.S. Army Corps of Engineers under an Interagency Agreement with EPA. Based on the results of the work, the decision was made to clean up the Site using multiple OUs. Contaminants of concern included arsenic, dioxin, PCP, and polycyclic aromatic hydrocarbons (PAHs)[1]. The Site posed potential human health hazards and environmental threats primarily through incidental ingestion of site contaminants, dermal contact with contaminated soil, and/or inhalation of contaminated dust by trespassers and unprotected workers at the Site. In addition, groundwater, surface water, and sediments from the Site, which were contaminated with creosote and PCP, were transported off site by various mechanisms, thereby posing a threat to human health and the environment outside the boundaries of the Site.

[1] Polycyclic aromatic hydrocarbons are also known as polynuclear aromatic hydrocarbons.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria include:

1. Overall Protectiveness of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment
5. Short-term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

As a result of various studies, particularly the 1988 RI/FS, EPA concluded that it was prudent to commence mitigating certain site hazards while data gaps related to groundwater and soil contamination were being addressed. Therefore, it was proposed that the cleanup of the Site would be organized into multiple operable units. The OU1 ROD was signed in 1989. OU1 RA consisted of surface cleanup activities and site stabilization. It was implemented to eliminate visible hazardous conditions at the Site, protect the river, and control access to the Site. EPA issued an ESD in September 1993, to document and compare actual OU1 construction to ROD requirements. OU2 was originally planned to address additional investigations and protection of groundwater, while soil contamination issues and other site cleanup needs were deferred to OU3. It was anticipated that the OU2 ROD would address the cleanup of surface soils, surface waters, sediments, and the aquifers affected by the Site. In reality, the OU2 remediation focused on the solidification/stabilization of former process area soils only. The goal of the selected OU2 cleanup measures was to protect human health and the environment and enable the Site's use for industrial purposes by treating the contaminated surface soils, sludge, sediments, free creosote, emulsion, debris, and impounded water at the Site. A Monitoring Plan for the treated soil area, Central Creek, the South Fork of the Forked Deer River, and the Alluvial and Fort Pillow aquifers was included and implemented as part of the remedial action.

<u>OU1</u>
The January 5, 1989 ROD for OU1 selected the following remedy:

- deed restrictions limiting further use of the Site;
- construction of flood protection dike around the Site and site stabilization;
- removal and disposal of tanked liquids and sludge;

- removal and disposal of site structures; and
- installation of security fencing around the Site.

According to the ROD, the OU1 cleanup included: treatment of water contained in the tanks; incineration of oils and sludge from the tanks; decontamination, demolition, and disposal of the tanks; and consolidation and incineration of sludge (spilled or leaked) in the immediate vicinity of the buildings and tanks. Water from the tanks would be treated on-site utilizing a sand filter, filter press, and carbon adsorption unit. Treated water would be analyzed to document treatment efficiency and then discharged to the South Fork of the Forked Deer River or Central Creek. The oil and sludge from the Site would be incinerated off-site at a fixed facility or on-site in a mobile incinerator, if an off-site facility was unable to dispose of the waste. Site structures (buildings, tanks, pipes) would be decontaminated and disposed of off-site at a facility to be selected in consultation with TDHE (now TDEC). If possible, uncontaminated or decontaminated salvageable materials would be sold to a scrap dealer or recycler.

Flood-protection diking and a fence around the site boundary would be constructed to deter access by trespassers. Removal of non-process area structures and other incidental construction was not planned during the OU1 remedy, but would be addressed as part of the final remedy. During selection of a final remedy, monitoring on site water levels behind the dikes and pumping, treatment (as needed), and discharge of impounded water would take place to stabilize the Site. Remediation of surface soils was not planned during the OU1 remedy because bench or pilot-scale testing was needed to verify that the technologies discussed in the FS report were applicable to site conditions.

OU2

Additional remedial investigations and feasibility studies were conducted at the Site to evaluate its soil and groundwater contamination. The studies concluded that soil and water contamination existed in several portions of the Site. This finding resulted in EPA's decision to develop a final remedy at the Site.

On September 30, 1996, EPA issued the Site's OU2 ROD, which concluded that the Site would continue to be used as an industrial property. The 1996 ROD stated that the main objectives of the Site's remediation were to:

- mitigate potential health hazards due to incidental soil ingestion, dermal contact, and dust inhalation by current trespassers and future workers at the Site;
- protect the Alluvial and Fort Pillow aquifers, Central Creek, the South Fork of the Forked Deer River, and sediments impacted by the Site; and
- maintain the Site as an industrial property that will not pose a significant threat to human health or the environment.

The OU2 ROD also concluded that while there was no evidence of groundwater contamination outside the Site's boundaries, site groundwater required a long-term monitoring program that would evaluate the immobilized waste for integrity, and assess the effectiveness of natural attenuation of the remaining contaminants in the groundwater, the surface waters, and sediments. The OU2 ROD specified a remedy which called for:

- removal and off-site disposal of liquid waste;
- solidification/stabilization (S/S) of contaminated soil;
- deed restriction; and
- monitoring.

The OU2 ROD anticipated that the liquid waste recovery would drain creosote and water from affected soil to enhance the effectiveness of the S/S. The liquid would be treated on-site before final disposal at EPA-approved off-site facilities. The S/S phase would stabilize residual contaminants to limit their mobility and solidify contaminated soil into a mass of treated waste with minimal disintegration potential. This outcome would be achieved by excavating and mixing contaminated soils with appropriate chemical reagents such as Portland cement. The final product would be buried in the excavated area, properly graded, and capped. The other requirements of the remedy were institutional controls (ICs), which would be reflected in a land use restriction restricting residential, domicile, daycare, school, or church uses without prior TDEC approval, and prohibiting invasive activities that could compromise the integrity of the cover system. Additionally, the OU2 ROD included a five-year sampling program to monitor contaminants in the Site's groundwater, surface water, and sediment.

Industrial risk-based soil remedial goals were specified by the 1996 ROD. These cleanup goals were calculated to achieve the cancer risk protection level of 1×10^{-4} for future adult workers and were also determined to be protective of current youth trespassers.

Table 2: Soil Remediation Goals

Contaminant of Concern	Soil Remediation Goal (mg/kg)
arsenic	225
benzo (a) pyrene	41.5
dibenzo(a,h) anthracene	55
pentachlorophenol	3,000
dioxin	0.00225

While the OU2 ROD was under preparation, EPA's National Risk Management Research Laboratory (NRMRL) began to provide technical support for the Site as requested by Region 4. In early 1996, NRMRL included the Site in a national study of wood preserving waste treatment using S/S technologies. Science Applications International Corporation (SAIC) conducted the study for NRMRL. Contaminated soils were collected from three sites and three S/S vendors were chosen to treat the soils with several different chemical formulations. The results of the study indicated that soil contaminated with PCP and creosote could be immobilized effectively using S/S technologies.

4.2 Remedy Implementation

OU1

Remedial requirements for OU1 were accomplished between January 1989 and August 1991, except that some site structures were not demolished and no deed restriction was filed. The Site's flood protection levee was constructed and functional by early 1989. It was upgraded for improved effectiveness in 1990. Tanked liquids and sludge were accumulated, treated on-site, and finally incinerated off-site. Several site structures, including buildings and tanks, railroad lines, railroad ties, and other plant equipment that presented immediate hazards were demolished, dismantled, and/or salvaged. A chain-link security fence was installed around the Site in 1991.

OU1 activities focused on mitigating hazardous conditions at the plant process area, protecting the river, and preventing unauthorized access to the Site. Other problems and remedial activities related to contaminated soil and groundwater were deferred to future operable units.

OU2

In October 1996, SAIC conducted a site-specific, S/S treatability study for site soils using various mixtures of Portland cement, fly ash, carbon, lime, and/or kiln dust. The study was completed in late 1996, and the results included reagent mixtures, ratios, and associated costs for meeting the specified treatment goals. EPA contracted with Bechtel to conduct a performance-based remedial design (RD) for the Site in early 1997. The RD, which was completed in September 1997, was prepared in accordance with the OU2 ROD and the S/S treatability study results.

Because the State's technical staff had been actively involved with the site remedial activities conducted by EPA, the Region determined that, with appropriate technical support from EPA, the State could take the lead on remaining OU2 remedial activities. Therefore, EPA encouraged the State to consider conducting the remedial action. In August 1998, the State submitted a Fund-financed, State-lead Cooperative Agreement for the work. EPA approved and funded the agreement.

Remedial action construction began in May 1999. As part of the work, several site structures were demolished and removed from the site or dismantled, treated, and buried on-site. Creosote and water were drained from the soil and disposed of at an EPA-approved off-site location. Contaminated soil was excavated and treated with cement, carbon, and fly ash before being back-filled and compacted. Buried materials were covered with a geosynthetic clay liner and capped with twenty-four inches of clean fill. The final phase of the remedy construction consisted of site grading and seeding with grass. The property is restricted to industrial uses by the land use restriction filed with the Madison County Register of Deeds on July 7, 2005. The deed restrictions are intended to limit direct human contact with contaminated site soils and groundwater. The restrictions limit any invasive activity that could compromise the Site's remedy and also limit the installation of groundwater wells. Restrictions were imposed by EPA in 2003 and the State in 2004.

Approximately 81,000 tons of contaminated soil, 520,000 gallons of contaminated water, and 16,000 gallons of creosote were processed during the OU2 RA. Treated soil was buried on-site, compacted and capped in an approximately seven-acre area.

4.3 Operation and Maintenance (O&M)

There are currently no O&M activities being conducted on a regular basis at the site beyond the security and maintenance operations being done on a regular basis by the site owner/operator, Dement Construction Co.

TDEC visits the Site quarterly and works closely with property owners, Dement Construction, when physical changes are made to the Site. O&M activities, including well installation and groundwater sampling, were documented in the Five-Year O&M Plan from 2001 to 2005. Annual O&M costs are presented in Table 3. Costs were high in 2012 due to new monitoring well installation, sampling, and vertical flow study. There were no sampling activities or contractor costs for the site in 2010. Costs in 2013 and 2014 were $0 due to government shutdown and no contract in place for contractors to do work at the site. The 2012 costs reflect the field work and contracting for the well installation, sampling and vertical flow study related to the contaminated groundwater monitoring at the Site. What little sampling was done in 2010, 2013, and 2014 occurred at state expense and using state labor and laboratory.

Table 3: Annual O&M Contractor Costs

Year	Total Costs (rounded to the nearest $1,000)
2010	$0
2011	$50,000
2012	$93,000
2013	$0
2014	$0

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2009 FYR for the Site stated:

> "The Site's remedy is currently protective of human health and the environment because surface water and contaminated groundwater are not being used for potable purposes, and contaminated surface soils were excavated, treated, and capped appropriately. ICs and zoning are in place to restrict the Site to industrial uses, prevent activities that would compromise the remedy, and prevent installation of groundwater wells. The off-site migration of contaminated groundwater is currently being evaluated and needs to be addressed. There are no private wells on properties potentially affected by migrating contaminated groundwater. In order to ensure the Site's remedy remains protective in the long-term, the recommendations and follow-up actions listed above should be implemented".

The 2009 FYR included four issues and recommendations. Table 4 provides a summary of the recommendations made in the 2009 FYR as well as follow up actions taken to address the recommendations. The 2009 FYR was the second FYR for the OU2 RA. However, FYRs were conducted for the OU1 remedy in 1995 and 2000. Both OU1 FYRs concluded that the activities conducted during the OU1 RA met their objectives. In addition, the 2000 FYR indicated that a separate review of the OU1 remedy was no longer necessary, because the OU2 FYRs would address the entire Site.

Table 4: Progress on Recommendations from the 2009 FYR

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.1	Submit current site documents to the designated site repository.	TDEC	9/30/2009	All necessary site documents in the repository were destroyed due to flooding at the Jackson-Madison County Library. All documents were burned to CD and delivered to the library to create new digital repository.	2009
5.2	Secure groundwater monitoring wells that are in use and properly abandon those wells that are not in use and not anticipated to be used in the future.	TDEC	2012	Damaged wells were either repaired or abandoned according to their need. Several wells raised up to account for additional fill being added across the site. All wells appropriately secured with locking caps.	2011-2012

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.3	Complete the ongoing evaluation of contaminated groundwater to prevent further off-site migration of contaminants and monitor groundwater, surface water, and sediments quarterly until off-site contaminant migration has been addressed.	TDEC, USGS	Ongoing	Installed new wells across S.F. Forked Deer River (SFFDR) and conducted vertical flow study. USGS sampled Central Creek and SFFDR.	2011-2012
5.4	Evaluate the need for ICs on adjacent, off-site properties.	TDEC, USGS	Ongoing	Groundwater results, flow direction, vertical flow study and surface water work all indicate offsite properties are currently not being threatened by migrating groundwater contamination. Further groundwater and surface water work needed.	2010-12

5.1 Submit current site documents to the designated site repository.

It was discovered during the 2009 FYR that the site's public repository had been destroyed during flooding at the Jackson-Madison County Public Library (JMCPL). In response to this discovery, the TDEC-DOR created a new digital repository (on CD) and delivered it to the JMCPL in September 2009. The repository was last updated in 2013 when a CD containing the WRS Compass Report of Field Activities and Findings Report was delivered.

5.2 Secure groundwater monitoring wells that are in use and properly abandon those wells that are not in use and not anticipated to be used in the future.

In response to recommendations in the 2009 FYR, the TDOR tasked its RI contractor to secure, repair, and protect all site related monitoring wells that were unsecure or otherwise needed repair. Also, monitoring wells that were deemed unnecessary or could not be repaired were properly abandoned according to State and EPA regulation.

Repair actions included raising numerous wells up to the new ground surface elevation, painting the wells in a high visibility color, repairing the pad to MW-2D and turning it into a flush mounted well, and replacing locks and caps on all wells. Several wells and piezometers were properly abandoned due to the fact they were no longer deemed necessary.

5.3 Complete the ongoing evaluation of contaminated groundwater to prevent further off-site migration of contaminants and monitor groundwater, surface water, and sediments quarterly until off-site contaminant migration has been addressed.

Since the 2009 FYR, several phases of investigation have taken place at the site. Starting in November 2011, seven monitoring wells were installed to evaluate groundwater quality downgradient of the site, across the SFFDR. These wells were installed to 1), evaluate groundwater quality in the vicinity of the nearest residents to the site (approx. 1 mile away), 2) determine groundwater flow direction on the southwest side of the SFFDR, and 3) determine the depth of the Porter's Creek Clay across the site. The Porter's Creek Clay is the regional aquitard beneath the site.

A vertical flow study was conducted in January 2012 to assess the vertical component of groundwater flow across the site. Findings of the study indicate that the SFFDR is acting as a hydraulic barrier to shallow groundwater flow. There is an upward component to groundwater flow as deep as 100 feet bgs near the SFFDR. The belief is that the upward flow component, along with the northeasterly flow direction across the SFFDR, could be preventing contaminated groundwater from flowing past the SFFDR. Work by the USGS in 2012 seems to back up this belief, as sampling in the SFFDR and Central Creek indicates that shallow groundwater is entering the surface water system bordering the site.

A groundwater Remedial Investigation (RI) is currently being planned for the site in the near future to further investigate the groundwater and surface water pathways at the site.

5.4 Evaluate the need for IC's on adjacent, off-site properties.

Work done at the site since the 2009 FYR seems to indicate that the SFFDR is acting as a hydraulic barrier, preventing groundwater from leaving the site in the downgradient direction and instead entering the surface water pathway. Groundwater sample results from newly installed wells downgradient of the site show no contamination from site related compound. Properties adjacent to the site are not developed, are mostly unusable, and there is currently no plan to develop these properties. If in the future any of these properties is developed, an institutional control/land use restriction preventing the installation of groundwater wells should be placed on the property. There are no known laws or ordinances preventing the installation of a private well in either the City of Jackson or Madison County. If a private well is installed across the SFFDR, there is the possibility that it could draw contamination under the SFFDR even though it appears the SFFDR is acting as a groundwater divide.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in November 2013 and scheduled its completion for July 2014. The FYR review team was led by Don Sprinkle (TDEC-DOR-RPM) and Brad Jackson, (USEPA-RPM), and also included the EPA site attorney and public relations personnel. On January 16, 2014, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The team established that the FYR would require the following components:

- community notification;
- document review;
- data collection and review;
- site inspection;
- look at new soil screening levels
- local interviews; and
- FYR report development and review.

6.2 Community Involvement

On May 1, 2014, a public notice was published in the *Jackson Sun* newspaper announcing the commencement of the FYR process for the Site. The public notice provided EPA contact information and invited community participation in the FYR process. The press notice is available in Appendix B. The FYR report will be made available to the public once it has been finalized. Copies of this document will be placed in the Site's designated public repository: Jackson-Madison County Library located at 433 E. Lafayette St., Jackson, TN 38301. On March 12, 2014, as part of the site inspection, TDEC-DOR staff visited the Jackson-Madison Library. The site repository was made available and was up to date with the most recent sampling data collected by WRS-Compass in 2012. Upon completion of the FYR, a public notice will be placed in the *Jackson Sun* newspaper to announce the availability of the final FYR report in the document repository.

6.3 Document Review

This FYR included a review of relevant site documents including the ROD, remedial action reports, and recent monitoring data. A complete list of the documents reviewed can be found in Appendix A.

ARAR Review

CERCLA Section 121(d)(1) requires that remedial actions attain a degree of cleanup of hazardous substances, pollutants, and contaminants which assures protection of human health and the environment. Remedial goals establish the acceptable exposure levels that

are protective of human health and the environment. Where applicable or relevant and appropriate requirements (ARARs) of Federal environmental laws or promulgated State laws that are more stringent than federal laws are available, such ARARs are used to develop remedial goals. Where ARARs are not available or are not sufficiently protective of human health and the environment, risk-based remedial goals are developed.

According to the 1996 ROD, remedial goals for the five soil contaminants of concern (COCs) – (arsenic, benzo(a)pyrene, dibenzo(a,h)anthracene, pentachlorophenol, and dioxin TEQ) – were determined using a risk-based model. The selected remedial goals were designed to achieve a cancer risk protection level of $1x10^{-4}$ for Future Adult Workers (Table 5). The current EPA Regional Screening Level User's Guide, published in September 2008 (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm), states that cumulative cancer risk for all actual and potential carcinogenic contaminants found at a Site should not have a residual (after site cleanup) cancer risk exceeding 10^{-4}. Therefore, this review found that the risk assumption used to establish the original remedial goals remains adequate.

Table 5: 1996 Risk Based Remedial Goals for Soil COCs[1]

COCs	Cancer Risk of $1x10^{-4}$ (mg/kg)[2]
arsenic	225
benzo(a)pyrene	41.5
dibenzo(a,h)pyrene	55
pentachlorophenol	3,000
dioxin TEQ	0.00225

1. Based on lifetime cancer risk for Future Adult Workers
2. Protection level selected in 1996 ROD

6.4 Data Review

Soil

Since the focus of the project has largely been related to the groundwater and surface water pathways since 2009, no soil sampling has occurred since the last FYR.

In 2012, EPA released the completed final human health non-cancer dioxin reassessment, publishing an oral non-cancer toxicity value, or reference dose (RfD), of $7x10^{-10}$ mg/kg-day for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). TDOR and EPA believe it would be best to conduct a site-wide dioxin sampling event during the upcoming RI to reassess dioxin levels in soil outside the capped area of the site. Previous soil sampling for dioxin has not indicated that there is a dioxin issue in soil at the site, but TDOR and EPA will evaluate the dioxin levels to ensure protectiveness of the remedy. The most recent Regional Screening Tables list the following non-cancer soil screening levels for dioxin: 730 ug/kg TEQ for

industrial soil and 50 ug/kg TEQ for residential soil. The highest dioxin level detected in soil during the 1996 soil dioxin sampling was 9.6 ug/kg.

Groundwater

In 2011, a total of 7 additional monitoring wells were installed. Monitoring wells OSGW 7-2, 7-4, 7-6, 8-1, 9-1, and 10-1 were installed to the southwest of the site, across the SFFDR from the site, to evaluate groundwater quality on the southwest side of the river. Cluster OSGW 7 was installed approximately 1000 feet west of the site, while OSGW 8-1, 9-1, and 10-1 were installed approximately 1 mile away along Boone Lane, the location of the nearest residents to the site. Cluster OSGW 7 consisted of 3 wells, screened shallow (25-35'bgs), medium (50-60'bgs), and deep (152-162'bgs). These screened depths correlated with OSGW clusters 1 through 6 installed along the west and south sides of the site. Monitoring well OSGW 7-6 was installed on top of the Porter's Creek Clay, the regional aquitard underlying the site. MW-36 was installed directly upgradient of the former process area and was installed to screen the top of the Porter's Creek Clay.

Groundwater was sampled in February and October 2012 in conjunction with well installation activities and vertical flow study.

Table 6 details recent groundwater sampling results for COCs relative to their current drinking water standards. Other contaminants, such as pyrene, 1-methylnaphthalene and 2-methylnaphthalene were detected in groundwater samples, but these contaminants do not have MCLs. As in the 2009 FYR timeframe, PCP was detected above the MCL in several wells. Monitoring well 33 had a marked increase in contaminant levels compared to the 2008 sampling event, showing a 3-5x increase in levels of Acenaphthalene, Dibenzofuran, Fluorene, 1 and 2 Methylnaphthalene, Naphthalene, PCP, and Phenanthrene.

Newly installed monitoring wells MW-36, OSGW 7-2, 7-4, 7-6, 8-1, 9-1, and 10-1 were also sampled after installation. All compounds sampled for (SVOCs) were not detected in these wells. Historical groundwater sampling results are provided in Appendix F.

Table 6: 2010-2014 Groundwater Sampling Results

Well ID	Sample Date	Acenaphthene (µg/L)	Benzo(a)pyrene[3] (ug/L)	Dibenzo-furan (ug/L)	Naphthalene (ug/L)	PCP[4] (µg/L)
Tapwater RSL (ug/L)		400	0.0029	5.8	0.14	0.17
MCL (ug/L)			0.2			1
MW-2S	02/14/12	**412**	ND	**195**	**2560**	ND

Well ID	Sample Date	Acenaphthene (µg/L)	Benzo(a)pyrene[3] (ug/L)	Dibenzo-furan (ug/L)	Naphthalene (ug/L)	PCP[4] (µg/L)
	10/04/12	**460**	ND	**210J**	**3200**	**3.3J**
MW-2M	02/14/12	358	ND	**205**	**4960**	ND
	10/04/12	**490**	ND	**210**	**5600**	**190J**
MW-2D	02/14/12	Damaged				
	10/04/12	ND	ND	ND	ND	ND
MW-2MA	02/14/12	ND	ND	ND	ND	ND
	10/04/12	ND	ND	ND	ND	ND
MW-2DA	02/14/12	ND	ND	ND	ND	ND
	10/04/12	ND	ND	ND	ND	ND
PZ-22S	10/03/12	380	ND	**220**	**400**	**3.8**
PZ-22M	10/04/12	Damaged				
PZ-24S	10/05/12	240	ND	**40**	**64**	ND
PZ-24M	10/05/12	92	ND	**29**	ND	**2.8J**
PZ-25S	10/05/12	**590**	ND	**310J**	**4600**	**3100**
PZ-25M	10/05/12	**FP**	**FP**	**FP**	**FP**	**FP**
PZ-25D	Destroyed					
PZ-29S	10/02/12	**520**	ND	**280**	**3500**	**1700**
PZ-29M	10/03/12	300	ND	**180**	**760**	**820**
PZ-29D	10/03/12	180	0.81	**110**	**270**	**620**
PZ-31S	03/10/05	FP	FP	**FP**	FP	FP
PZ-31M	Destroyed					
PZ-31D	10/03/12	**520**	**2.0**	**280**	**6800**	**1200**
MW-32	10/05/12	ND	ND	ND	ND	ND
MW-33	02/13/12	91.6	ND	**60.7**	**2530**	ND
	10/02/12	170	ND	**76**	**3500**	**160**
MW-34	02/15/12	**FP**	**FP**	**FP**	**FP**	**FP**
	10/03/12	**FP**	**FP**	**FP**	**FP**	**FP**
MW-35	02/14/12	ND	ND	ND	ND	ND
	10/05/12	ND	ND	ND	ND	ND
MW-36	02/13/12	ND	ND	ND	ND	ND
OSGW 1-1	02/12/12	ND	ND	ND	ND	ND
OSGW 1-2	02/12/12	ND	ND	ND	ND	ND
OSGW 1-3	02/12/12	ND	ND	ND	ND	ND
OSGW 1-4	02/12/12	ND	ND	ND	ND	ND
OSGW 1-5	02/12/12	ND	ND	ND	ND	ND
OSGW 1-6	02/12/12	ND	ND	ND	ND	ND
OSGW 2-1	02/09/12	ND	ND	ND	ND	ND
OSGW 2-2	02/09/12	ND	ND	ND	ND	ND
OSGW 2-3	02/09/12	ND	ND	ND	ND	ND
OSGW 2-4	02/09/12	ND	ND	ND	ND	ND
OSGW 2-5	02/09/12	ND	ND	ND	ND	ND
OSGW 2-6	02/09/12	ND	ND	ND	ND	ND
OSGW 3-1	02/08/12	ND	ND	ND	ND	ND
OSGW 3-2	02/08/12	ND	ND	ND	ND	ND

Well ID	Sample Date	Acenaphthene (µg/L)	Benzo(a)pyrene[3] (ug/L)	Dibenzo-furan (ug/L)	Naphthalene (ug/L)	PCP[4] (µg/L)
OSGW 3-3	02/08/12	ND	ND	ND	ND	ND
OSGW 3-4	02/08/12	ND	ND	ND	ND	ND
OSGW 3-5	10/06/05	ND	ND	ND	ND	ND
OSGW 3-6	02/08/12	ND	ND	ND	ND	ND
OSGW 4-1	02/07/12	ND	ND	ND	ND	ND
OSGW 2-4	02/07/12	ND	ND	ND	ND	ND
OSGW 4-3	02/07/12	ND	ND	ND	ND	ND
OSGW 4-4	02/07/12	ND	ND	ND	ND	ND
OSGW 4-5	02/07/12	ND	ND	ND	ND	ND
OSGW 4-6	02/07/12	ND	ND	ND	ND	ND
OSGW 5-1	02/05/12	ND	ND	ND	ND	ND
OSGW 5-2	02/05/12	ND	ND	ND	ND	ND
OSGW 5-3	02/05/12	ND	ND	ND	ND	ND
OSGW 5-4	02/05/12	ND	ND	ND	ND	ND
OSGW 5-5	02/06/12	ND	ND	ND	ND	ND
OSGW 5-6	02/06/12	ND	ND	ND	ND	ND
OSGW-6-1	02/02/12	ND	ND	ND	ND	ND
OSGW 6-2	02/03/12	ND	ND	ND	ND	ND
OSGW 6-3	02/03/12	ND	ND	ND	ND	ND
OSGW 6-4	02/03/12	ND	ND	ND	ND	ND
OSGW 6-5	02/03/12	ND	ND	ND	ND	ND
OSGW 6-6	02/05/12	ND	ND	ND	ND	ND
OSGW 7-2	02/01/12	ND	ND	ND	ND	ND
OSGW 7-4	02/01/12	ND	ND	ND	ND	ND
OSGW 7-6	02/02/12	ND	ND	ND	ND	ND
OSGW 8-1	02/01/12	ND	ND	ND	ND	ND
OSGW 9-1	02/01/12	ND	ND	ND	ND	ND
OSGW 10-1	02/01/12	ND	ND	ND	ND	ND

Notes:
PCP=Pentachlorophenol
RSL=Regional Screening Level for residential tapwater from USEPA Region 3, 6, and 9 (April 2012)
MCL=Maximum Contaminant Level
ND=Not detected
FP=No sample collected due to the presence of free product
Concentration in **BOLD** text exceed the Tapwater RSL
Shaded concentrations exceed the MCL

Surface Water and Sediment

The U.S. Geological Survey, in cooperation with the Tennessee Division of Remediation, conducted an investigation at the site to evaluate contaminant sources and loads to surface water, to evaluate filtered versus unfiltered water samples, and to evaluate contaminant concentrations in sediment.

During June, 2012, samples were collected from 11 surface-water sites, 4 wells, and 9 shallow groundwater sites. Four field QA/QC samples were collected. Nineteen sediment samples were collected from 12 sites along the channel and banks of the SFFD and Central

Creek. Samples from 6 sites were also filtered in the field to evaluate potential adsorption of contaminates relative to the dissolved phase. All of the samples were analyzed for semi-volatile organic compounds.

Water samples from the SFFD generally had no detectable SVOCs except for low-level (J code), estimated concentrations of benzyl alcohol at the downstream site (SF-06) and acenapthene and naphthalene near the railroad bridge crossing (SF-03). Stream flow in SFFD was measured at a general increase from about 142 cubic feet per second (cfs) at SF-01 to about 144 cfs near the ACW site to 149 cfs at the downstream site, SF-06.

Central Creek

Water samples were collected from 4 sites along Central Creek. The upstream site (CC-01) is located at the State Street bridges and the downstream site is located just downgradient of a sewer line crossing the creek. An additional sample was collected from a small un-named tributary to Central Creek. The water samples collected from the upstream sites on Central Creek (CC-01 and CC-02) and the unnamed tributary were reported only with low-level estimated (J) concentrations for benzyl alcohol and bis(2-ethylhexyl)phthalate. Nine creosote related compounds were detected in water samples from the downstream sites (CC-03 and CC-06) on Central Creek. Concentrations for 6 of the 9 detected creosote related compounds decreased in concentration from CC-03 to CC-06; including acenapthene (34 micrograms per liter (ug/L) decreasing to 14 ug/L), fluorine (13 ug/L to 5.9 ug/L), dibenzofuran (11 ug/L to 4.4 ug/L), and naphthalene (5.8 ug/L to nondetect). Flow along Central Creek during June and August 2012 was variable with stream flow conditions changing from losing to gaining and back to losing flow. Flow in Central Creek was either very low or decreasing from CC-01 to CC-02 in June and August 2012. Measured flow at CC-02 and CC-06 showed a decrease in flow from 0.097 to 0.057 cfs (45 – 26 gallons per minute) on June 18-20, 2012 and from 0.045 to 0 cfs (20 to 0 gallons per minute) on August 7, 2012. Field observations at CC-03 on June 20, 2012 indicate the presence of seeps and small upwellings of flow to Central Creek indicative of a gaining reach. Flow could not be measured at CC-03 due to depth and velocity conditions. On August 7, 2012 flow at the CC-06 site (downstream of the sewer crossing) was zero based on zero velocity in the water. A measurement was made upstream of the sewer and flow was 0.057 cfs (26 gal/min) indicating a slight increase in flow along Central Creek from CC-02 to the sewer crossing and then a loss of flow near the sewer crossing.

Groundwater

Groundwater samples were collected from shallow drive points and pits along the banks of SFFD and Central Creek and from 4 wells at the American Creosote Works site in June 2012. Most of the groundwater sample had low-level estimated concentration of bis-2- ethylhexyl phthalate and benzyl alcohol that are probably not related to contamination from the site. Shallow groundwater samples collected from sites along the SFFD, upstream from the railroad bridge (SF-2-DP and SF-3-Rt Bank) and from a site about 0.4 miles downstream from the ACW site (site SF-05-DP) did not have detectable concentrations of creosote related compounds, except for a low-level estimated (J code) 1.7 ug/L acenaphthene at SF-3-Rt Bank (table 5). Similarly, the shallow groundwater sample collected from a pit along Central Creek at the upstream site (CC-02-DP) did not have detectable concentrations except for an estimated (J code) 6.9 ug/L 1,4-dioxane.

Shallow groundwater samples collected from other sites along Central Creek (CC-3-DP, CC-6- DP, and CC-5-DP) and along the SFFD at and downstream of the railroad bridge (SF-3-Bridge and SF-3-DP) were impacted by creosote related compounds. Detected compounds included acenaphthene, fluoranthene, fluorine, phenanthrene, dibenzofuran, naphthalene, 2-methylnaphthalene, anthracene, and pyrene.

Sediment Samples
Sediment samples were collected from 12 sites to evaluate the potential adsorption of creosote related compounds to the subsurface sediments and stream bed sediments. The sediment samples were analyzed for semi-volatile organic compounds by the TDEC laboratory. One sample, SF-05A, was collected from a clean sand flood deposit at the top of the bank as a field blank QA/QC sample – no compounds were detected in this sample. The sediment samples represent bed material in SFFD and Central Creek as well as bed and bank sediments that were out of the active streambed.

Reported concentrations in sediment were non-detect for SVOC's at the upstream site SF-2 and the downstream sites SF-5 and SF-6. The only creosote related compounds detected in sediment sample occurred in the sample collected from the site at the railroad bridge (SF-3-Bridge) and included acenaphthene, dibenzofuran, fluorine, and phenanthrene, which could be related to the creosote treated bridge material.

The bank and bed sediment samples collected along Central Creek had more occurrences and higher concentrations of creosote related compounds. The upstream sites on Central Creek (CC-01 and CC-02) had the lowest number of compounds detected and the concentrations were generally lower. Sediment samples collected from the downstream sites CC-03 and CC-06 consistently had higher concentrations of creosote related compounds.

Samples were collected from four depositional environments along Central Creek below the sewer line crossing (CC-06). The samples included sediment directly from the bed of the flowing stream (CC-06), cross-bedded flood deposits on the back including thin, alternating layers of tan sand and black sand-sized particles with a creosote odor (CC-06-A), a thin layer of clay and silt with an obvious sheen (CC-06-B), and sediment collected from 2-ft below land surface (CC-06-D). The sample of the flood-deposit sediment (CC-06-A) had low-level, estimated concentrations of 7 compounds including fluoranthene (816 ug/L), fluorine (756 ug/L), phenanthrene (898 ug/L) and pyrene (721 ug/L). The occurrence of these compounds in the deposited sediment indicates that, at least, low-level concentrations of creosote related compounds are being transported with the sediment from Central Creek to the SFFD.

6.5 Site Inspection

On March 12 and 18, 2014 Don Sprinkle of TDEC-DOR inspected the Site. The Site is now owned by JEA (315 Meadow St.) and Dement Construction (318 Meadow St.). Dement Construction has put the 318 Meadow Street portion of the Site into reuse; the company placed several feet of clean fill and a gravel bed over the entire site except lagoon areas to create a storage area for construction equipment and materials. There are also buildings on-site, including an office building and maintenance/storage shed. The Site is secured by a fence and gated. Where the site drainage ditch meets Central Creek on the southeast portion of the east side of the Site, there is a break in the fence that could

possibly be accessed by trespassers. The JEA property is enclosed by fencing and is also used for equipment storage.

TDEC-DOR monitors the Site regularly and works with the property owners when major changes are made to the Site, such as the addition of the gravel bed and buildings. TDEC-DOR also performs groundwater monitoring activities at the Site. All wells on the site were found to be secured, with the exception of one well (MW-25) that had recently been struck and damaged by heavy equipment.

TDEC-DOR visited the Madison County Deed Records Office on March 18, 2014. The Site consists of two properties located at 315 and 318 Meadow Street. The Madison County parcel numbers for the properties are 014.00 and 014.01. The following table summarizes the available information found at the Deed Records Office.

Table 7: Deed Documents from Madison Public Records Office

Date	Type of Document	Description	Book #	Page #
1981	Warranty Deed	Property sold from American Creosote Works, Inc. (a Delaware Corp. with principle place of business in Florida) to American Creosote Works Tennessee, Inc. (a Tennessee Corp.).	406	446
2003	Clerk and Master's Tax Deed	315 Meadow Street property sold to Jackson Energy Authority at public auction due to delinquent taxes.	D648	269
2005	"Corrected" Notice of Land Use Restrictions	Land use restrictions precluding inappropriate land use (such as residence, domicile, daycare, church, or school) without approval from TDEC. TDEC must also be notified prior to any invasive activity which could compromise the cap. The restrictions run with the land.	T1687	167
2005	Warranty Deed	318 Meadow Street property sold from Jackson Energy Authority to Meadow Street Properties, LLC.	D673	336

TDEC-DOR visited the designated local repository for the Site at the Jackson Madison Public Library located at 433 E. Lafayette St., Jackson, TN 38301. The site repository, which had been destroyed by flooding prior to the 2009 FYR, has been replaced with a digital copy of all pertinent site documents.

Tables 8 and 9 list the ICs associated with areas of interest at the Site. Table 9 lists the adjacent off-site properties that could be exposed to contamination moving off site.

Table 8: IC Summary Table

Area of Interest – Site (Parcels: 008 014.00 and 008 014.01)					
Media	**ICs Needed**	**ICs Called for in Decision Documents**	**Impacted Parcel(s)**	**IC Objective**	**Instrument in Place**
Soil	Yes	Yes	008 014.00 and 008 014.01	Prevent contact with contaminated soils and protect soil remedy.	Land use restriction[1]
Sediment	No	No	008 014.00 and 008 014.01	None	None
Ground Water	Yes	Yes	008 014.00 and 008 014.01	Restrict installation of potable water wells to prevent use of contaminated groundwater and protect soil remedy.	Land use restriction[1]
Surface Water	No	No	008 014.00 and 008 014.01	None	None
1. Land use restriction is provided in Appendix G.					

Table 9: Adjacent, Off-Site Property IC Summary Table

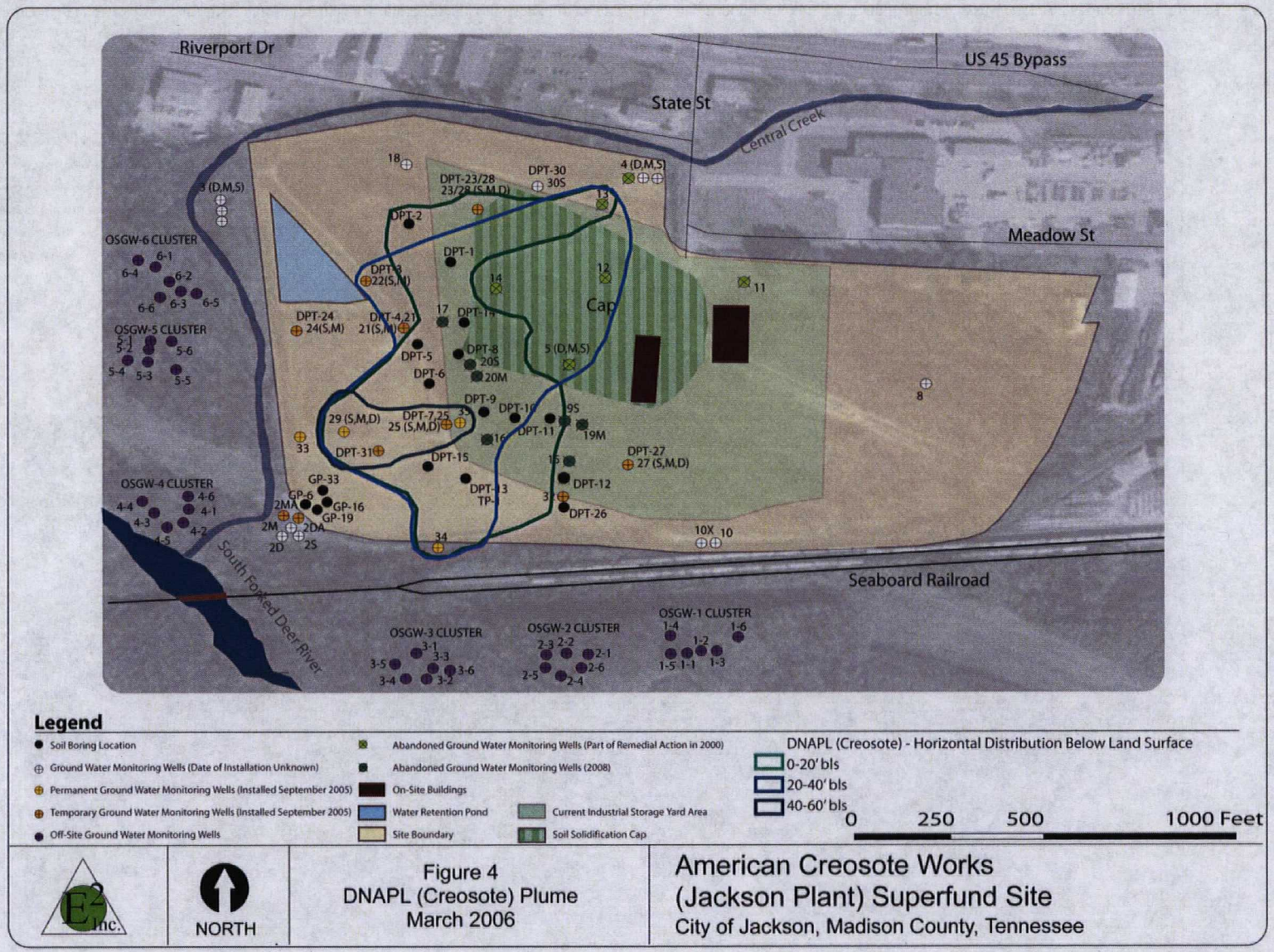
Area of Interest – Adjacent Properties to Site (Parcels: 088 013.00, 077 042.00, and 077 043.00)					
Media	**ICs Needed**	**ICs Called for in Decision Documents**	**Impacted Parcel(s)**	**IC Objective**	**Instrument in Place**
Ground Water	Yes	No	088 013.00, 077 042.00, and 077 043.00	Restrict installation of groundwater wells and use of groundwater.	None

Figure 3 details the parcel boundaries at the Site. Figure 4 shows the extent of the NAPL (creosote) plumes in 2006 and Figure 5 shows the PCP plumes in 2006.

Figure 3: IC Base Map

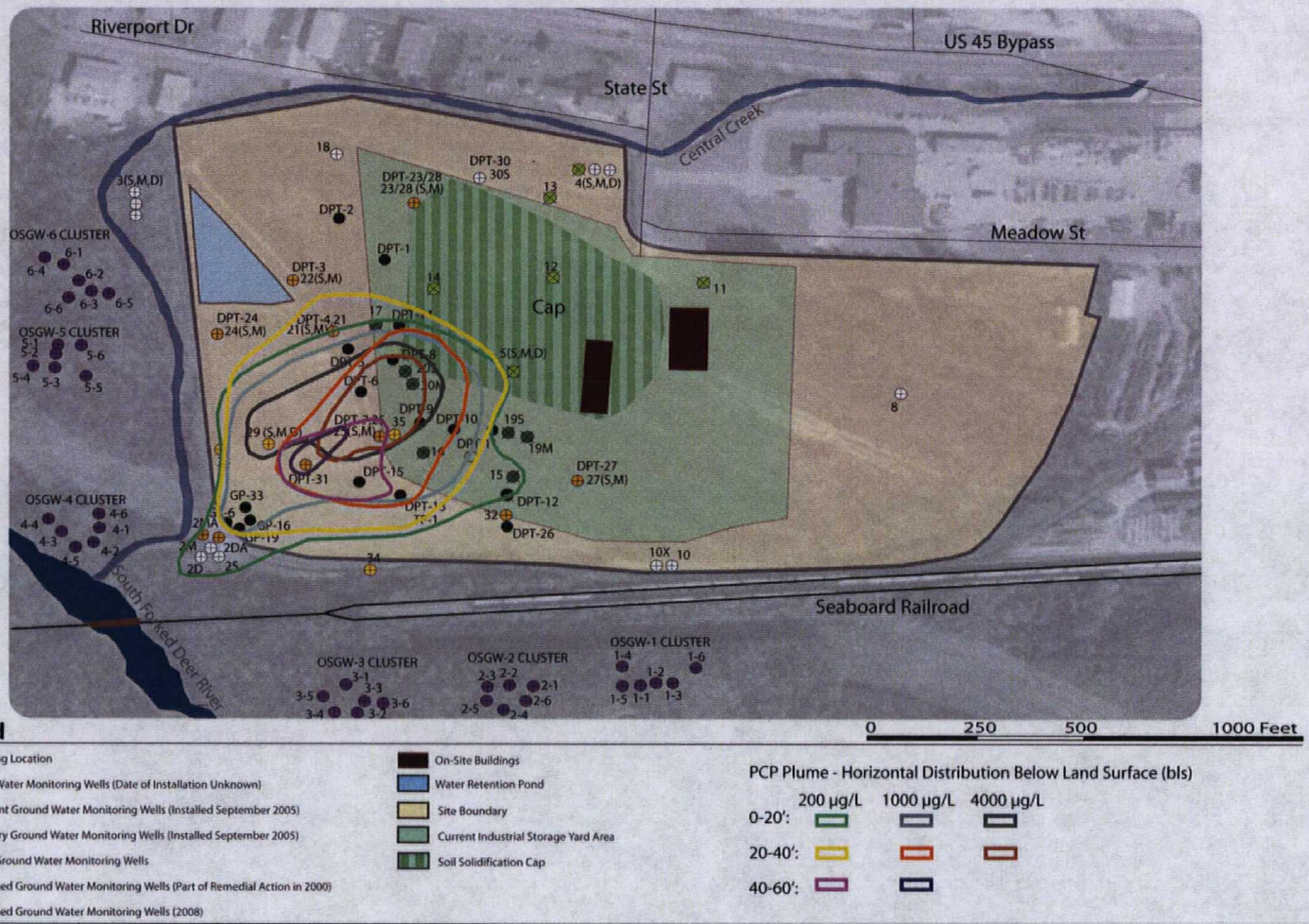
Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

Figure 4: 2006 Creosote Plume Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

Figure 5: 2006 PCP Plume Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

6.6 Interviews

During the FYR process, interviews were conducted with parties impacted by the Site, including the current landowners, and regulatory agencies involved in site activities or aware of the Site. The purpose of the interviews was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy that have been implemented to date. All of the interviews were conducted during the month of March 2014, and were a combination of in-person, telephone and email interviews. Interviews are summarized below and complete interviews are included in Appendix C.

Ron Sells: Mr. Sells is the Manager for the TDEC-DOR, Jackson Field Office. Mr. Sells believes the site cleanup is going very well, and the soil stabilization that took place in 2000 eliminated the human contact threat at the site and has helped eliminate contaminants from leaching into the environment. He feels that the working relationship that the State and USEPA have had has been a major contributor the successful investigation and remediation of the site to this point.

Dement Construction: Mr. Drew Newmon is the office manager for site owner Dement Construction. Mr. Newmon thinks the cleanup at the Site is going well. Mr. Newmon thinks the cleanup of the Site has been an improvement to the community, as prior to cleanup it was a dump. He stated that in the last 10 years the site appearance has improved drastically. Mr. Newmon was aware that drinking water wells are not to be installed on site, per land use restrictions.

Resident 1: Resident 1 is somewhat aware of the Site and the cleanup activities and thinks that the Site is being cleaned up properly, but wishes the cleanup was going faster. Resident 1 would like to be kept more informed by way of more frequent meetings and newsletters.

Nearby business owner: Mr. Kevin Atkins of HMC Inc. was unaware of the site's history and seemed interested in learning more. He was aware of the wood preserving process and creosote from working in a lumber yard previously. His only concern seemed to be if the site was posing a threat to him or his workers. After briefing him on what's been done and upcoming work, he seemed appreciative and gave me his contact email address to be kept informed of site activities.

City of Jackson contact: Ms. Kathleen Huneycutt with the City of Jackson was also aware of the site history and the fact that cleanup actions have taken place. She is glad that the site is back to productive use and back on the tax rolls.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

Yes, the review of documents, risk assumptions, and the site inspection indicate that the remedy is functioning as intended by the 1989 and 1996 RODs. The Site was stabilized during the OU1 RA and the OU2 RA cleaned the surface soils to industrial use standards.

Under OU1 RA, hazardous surface materials were eliminated and Site property was secured to prevent unauthorized access. Approximately 81,000 tons of contaminated surface soil, 520,000 gallons of water, and 16,000 gallons of creosote were processed during the OU2 RA. Treated soils were compacted and capped in the Site's seven-acre backfill area. The soil treatment and capping has led to the property being put back into productive use as a construction company's headquarters and storage facility.

Land use restrictions limiting the property to industrial uses were filed with the Madison County Register of Deeds on July 7, 2005. The land use restrictions specify that any invasive activity that could compromise the Site's remedy requires the approval of the TDEC. The land use restrictions also prohibit groundwater well placement without TDEC approval. Though not called for in the decision documents, further assessment of the Site may be needed to determine if ICs are necessary to restrict use of groundwater on adjacent, off-site properties due to the potential migration of contaminated groundwater from the Site. However, there are currently no private wells on properties potentially affected by the contaminated groundwater migrating from the Site, and recent data indicates that the SFFDR is acting as a hydraulic divide in the area of the site. There are no known laws or ordinances in Jackson or Madison County preventing the installation of a private well, however, so deed restrictions may be warranted on property located directly across the SFFDR.

The 1996 OU2 ROD called for the monitoring of surface water, sediments, and groundwater. Groundwater was monitored to characterize groundwater contamination and its migration pattern. Surface water and sediments were sampled in 2012 and indicated shallow groundwater is entering the surface water system due to a gaining surface water system. The groundwater and surface water pathways should be evaluated further, and plans for the site include Remedial Investigative work for both of these pathways in the near future.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

In 2012, EPA released the completed final human health non-cancer dioxin reassessment, publishing an oral non-cancer toxicity value, or reference dose (RfD), of $7x10^{-10}$ mg/kg-day for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). TDOR and EPA believe it would be best to conduct a

sitewide dioxin sampling event during the upcoming RI to reassess dioxin levels in soil outside the capped area of the site. Previous soil sampling for dioxin has not indicated that there is a dioxin issue in soil at the site, but TDOR and EPA will evaluate the dioxin levels to ensure protectiveness of the remedy.

The most recent Regional Screening Tables list the following non-cancer soil screening levels for dioxin: 730 ug/kg TEQ for industrial soil and 50 ug/kg TEQ for residential soil. The highest dioxin level detected in soil during the 1996 soil sampling was 9.6 ug/kg.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The need to conduct indoor air sampling and the need to assess the dioxin issue since a new dioxin standard is now in place has led to the determination that the site is now in the "protectiveness deferred" status. Indoor air sampling and dioxin soil sampling are planned for the upcoming RI now in the planning stages for the site. It is anticipated that field work will begin in late 2014.

7.4 Technical Assessment Summary

The review of documents, risk assumptions, and the site inspection indicate that the remedy is functioning as intended by the 1989 and 1996 RODs. The Site was stabilized during the OU1 RA effectively eliminating surface hazards and securing the property to prevent unauthorized access. OU2 RA cleaned the surface soils to industrial standards and provided for land use restrictions to protect the remedy while the Site is being re-used by a new owner.

Recent Site monitoring results indicate that PCP-contaminated groundwater is moving off site, at least as far as Central Creek and the SFFDR. Evidence of groundwater entering the surface water pathway has been tentatively identified by the USGS (2012), and needs to be investigated further. There are no private wells close to the Site and no area residents currently use the groundwater for potable purposes. Nevertheless, there are on-going activities to determine how to address the issue of Site Contaminant migration. Pending resolution of the problem, ICs may need to be explored and put in place for the parcels of land near the Site to ensure that potentially contaminated groundwater is not used in the area for potable purposes.

In 2012, EPA released the completed final human health non-cancer dioxin reassessment, publishing an oral non-cancer toxicity value, or reference dose (RfD), of $7x10^{-10}$ mg/kg-day for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). Previous soil sampling for dioxin at the Site has not indicated that there is a dioxin issue, but TDOR and EPA will evaluate the dioxin levels to ensure protectiveness of the remedy. The most recent Regional Screening Tables list the following non-cancer soil screening levels for dioxin: 730 ug/kg TEQ for industrial soil and 50 ug/kg TEQ for residential soil. The highest dioxin level detected in soil

during the 1996 soil sampling was 9.6 ug/kg, but since the new dioxin standard was released in 2012, TDOR and EPA believe another look at the issue is warranted during the upcoming RI planned for late 2014.

8.0 Issues

Table 10 summarizes the current issues for the Site.

Table 10: Current Issues for the Site

Issue	Affects Current Protectiveness (Yes or No)	Affects Future Protectiveness (Yes or No)
Contaminated groundwater is moving off site.	No	Yes
No groundwater use restrictions are on adjacent off-site properties.	No	Yes
Need to evaluate the potential for vapors to migrate from contaminated soil into overlying buildings.	Yes	Yes

9.0 Recommendations and Follow-up Actions

Table 11 provides recommendations to address the current issues at the Site.

Table 11: Recommendations to Address Current Issues at the Site

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes or No)	
					Current	Future
Contaminated groundwater is moving off site.	Complete the ongoing evaluation of contaminated groundwater to address the potential effects of Site contaminants on off-site groundwater, the creek and river nearby.	EPA	State	12/31/2016	No	Yes
No groundwater use restrictions are on adjacent off-site properties.	Evaluate the need for ICs on adjacent, off-site properties.	EPA	State	12/31/2015	No	Yes
Conduct dioxin reassessment and evaluate the chemical vapor intrusion pathway at the site	Collect soil samples for dioxin analysis beyond the capped area of the site and air samples for VOC analysis at Construction Company headquarters building on site.	EPA	State	12/31/14	Yes	Yes

10.0 Protectiveness Statements

The overall Site's remedy is currently categorized as "protectiveness deferred" due to the need for chemical vapor intrusion sampling in the onsite office building, and also the need for updated soil sampling data to evaluate the risk of dioxins in surface soil outside the capped area. These sampling needs are to be met during an anticipated RI that is in the planned for late-2014.

With respect to the individual OUs, OU1 is considered protective. The remedy implemented under this operable unit was accomplished between January 1989 and August 1991. Tasks under this remedy included installation of a security fence around the site, building a flood protection levee, removal and treatment of tanked liquid and sludge, and the demolition of site structures, buildings, and equipment determined to constitute an immediate hazard. The OU2 remedy is currently categorized as "protectiveness deferred" due to the need for chemical vapor intrusion sampling in the onsite office building and dioxin reassessment of off-property soils.

Surface water and contaminated groundwater are not being used for potable purposes, and contaminated surface soils were excavated, treated, and capped appropriately during the 1999 remedial action. IC's and zoning are in place to restrict the Site to industrial uses, prevent activities that would compromise the remedy, and prevent installation of groundwater wells. The off-site migration of contaminated groundwater is currently being evaluated and needs to be addressed, but it appears the surface water system in the site vicinity is acting as a hydraulic barrier to groundwater flow. There are currently no private wells on properties potentially affected by migrating contaminated groundwater. The nearest private well in the downgradient direction is over one mile away.

In order to ensure that the Site's remedy remains protective in the long-term, the following actions are recommended:

- Evaluate the vapor intrusion pathway to ensure the protection of the onsite workers in the Dement Construction Company headquarters building;
- Complete the ongoing evaluation of contaminated groundwater and groundwater to surface water pathway to determine the potential for off-site migration of site contaminants and sample surface water, groundwater, and sediments to monitor potential off-site groundwater contaminant migration;
- Re-assess dioxin levels beyond the capped area of the site;
- Determine if groundwater IC's are appropriate for adjacent properties.

11.0 Next Review

This Site requires statutory reviews, at least, every five years as long as hazardous substances, pollutants, or contaminants are left on-site at levels that do not allow for unrestricted use and unlimited exposure. The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

American Creosote Works, Five-Year Review, Jackson, TN. EPA. September 28, 2000.

American Creosote Works, Inc., CERCLA NPL Site, Operable Unit One. Five-Year Review. Jackson, Madison County, Tennessee. US EPA. January 25, 1995

American Creosote Works, Inc., CERCLA NPL Site, Operable Unit One. Remedial Action Report. Jackson, Madison County, Tennessee. US EPA. September 20, 1993.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS) Site Information accessed from Web site http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0403623 December 2008-February 2009.

EPA Superfund: Record of Decision: American Creosote Works, Inc. (Jackson Plant) EPA ID: TND007018799. OU1. Jackson, TN. January 5, 1989.

EPA Superfund: Record of Decision: American Creosote Works, Inc. (Jackson Plant) EPA ID: TND007018799. OU2. Jackson, TN. September 30, 1996.

Explanation of Significant Differences to the Record of Decision Operable Unit #1, American Creosote Works, Inc., CERCLA NPL Site. Jackson, Madison County, Tennessee. US EPA. September 17, 1993.

Permeable Reactive Barrier Design Work Plan, Former American Creosote Works Site, TDEC. Jackson, Tennessee. Prepared by Shaw Environmental, Inc. April 2008.

Soil and Groundwater Investigation and Treatability Study (Draft Report of Findings), American Creosote Works, Jackson, Tennessee. Prepared by Shaw Environmental, Inc. March 2006.

Superfund Five-Year Review Report. American Creosote Works Site. Jackson, Tennessee. US EPA. July 2004.

Superfund-Five Year Review Report. American Creosote Works Site. Jackson, Tennessee. USEPA. July 2009.

Report of Field Activities and Findings. Former American Creosote Works. Jackson, Madison County, Tennessee. TDEC-DOR. April 2012.

Appendix B: Press Notice

U. S. Environmental Protection Agency Region 4
Announces a Five-Year Review
for the American Creosote Works (Jackson Plant) Superfund Site,
Jackson, Madison County, Tennessee

EPA invites community participation in the Five-Year Review process.

Purpose/Objective: The U.S. Environmental Protection Agency (EPA) is conducting a Five-Year Review of the remedy for the American Creosote Works (Jackson Plant) site (Site) in Jackson, Tennessee. The purpose of the Five-Year Review is to ensure that the selected cleanup actions effectively protect human health and the environment.

Site Background: The American Creosote Works (Jackson Plant) site is located in Jackson, Madison County, Tennessee. The 60-acre Site was a wood-treatment plant operated from the early 1930s until late 1981 when the operator filed for bankruptcy. The plant used creosote and pentachlorophenol to preserve wood. Groundwater underlying the facility, on-site soils, surface water, and sediments were contaminated with volatile organic compounds, polycyclic aromatic hydrocarbons, and heavy metals from the wood-treating process. On June 10, 1986, the Site was added to the Superfund National Priorities List (NPL) of contaminated properties.

Clean-up Actions: Clean-up activities at the Site have been conducted under two Records of Decision (RODs) to date. The January 5, 1989 ROD selected a remedy for the Site that included: 1) deed restrictions to limit further use of the Site; 2) construction of a flood protection dike around the Site and Site stabilization; 3) removal and disposal of tanked liquids and sludge; 4) removal and disposal of Site structures; and 5) installation of security fencing around the Site. The September 30, 1996 ROD selected a remedy that included: 1) removal and offsite disposal of liquid waste; 2) solidification/stabilization (S/S) of contaminated soil; 3) deed restriction; and 4) monitoring. During 1989 and 1990, contaminated soils and sludge were transported off site for incineration. All tank liquids were treated and disposed of appropriately, and all process equipment was dismantled and salvaged. A sump pump and a large drainage pipe to the river were installed to control flooding and the Site was fenced to prevent trespassing. Between May 1999 and May 2000, creosote and contaminated water were extracted from the Site and approximately 81,000 tons of contaminated soil were excavated and treated by mixing with cement and other chemicals before being returned into the excavated area of approximately seven acres. The area was then covered with clay, top soil, and grass. Currently, the groundwater is being monitored for site-related contaminants.

Five-Year Review Schedule: The National Contingency Plan requires that remedial actions that result in any hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure be reviewed every five years to ensure protection of human health and the environment. Five-Year Reviews were completed for the Site in 1995, 2000, 2004, and 2009. Each previous Five-Year Review found the Site to be protective of human health and the environment. The fifth of these Five-Year Reviews for this Site will be completed by July 21, 2014.

EPA invites community participation in the Five-Year Review process.

EPA is conducting this Five-Year Review to evaluate the effectiveness of the remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA is available to answer questions about the Site. Community members who have questions about the Site, the Five-Year Review process, or who would like to participate in a community interview, are asked to contact the following:

Brad Jackson, Remedial Project Manager
404-562-8925
Jackson.brad@epa.gov

U.S. EPA - Region 4 Mailing Address
61 Forsyth Street, S.W.
Atlanta, GA 30303-8960

Online: *http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0403623*

Appendix C: Interview Forms

Site Name: American Creosote Works, Jackson Plant **EPA ID No.:** TND007018799
Interviewer Name: Donnie A. Sprinkle **Affiliation:** TDEC-DOR
Subject's Name: Ron Sells **Affiliation:** TDEC
Subject's Contact Information: 731-512-1304
Time: 09:00 AM **Date:** March 19, 2014
Type of Interview (Circle one): In Person Phone Mail Other_____
Location of Interview: TDEC Jackson Field Office

State of Tennessee

1. What is your overall impression of the project?

   This NPL Site has been investigated to the extent that it is known that no current groundwater users are at risk. On-site risk for soil exposure has been reduced by the previous stabilizing/capping remedial action. In addition to the remedial action, the current owner has filled areas for their use thus reducing direct exposure. The impact to the surface water pathway from shallow groundwater and surface drainage should be further investigated.

2. How well do you believe the remedy currently in place is performing?

   The current remedy focused on the former Process Area by stabilizing the treated soil and capping. It is currently protective of on-site direct exposure, and it has reduced the possibility of contaminants leaching into the environment.

3. Are you comfortable with the ICs required for the site and their current status of implementation?

   Yes, because there are no groundwater users impacted by site related compounds. Site access is adequately controlled by fencing.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   No.

5. Has your office conducted any site-related activities or communications in the last five years? If so, please give purpose and results of these activities.

   In 2012, TDoR conducted off-site groundwater monitoring at existing monitoring wells, newly installed wells, and residential wells. The focus of that event was to determine if the South Fork Forked Deer River acts as a hydrogeological barrier to the down gradient

migration of site related compounds. Data suggests that the river acts as a barrier to a great extent. Interviews with stakeholders occur with every 5 Yr ROD Review.

6. Do you feel well informed about the site's activities and progress?

   Yes.

7. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   EPA Region 4 and TDoR have always worked well together on this project. The mutual respect that each agency has for each other means that project management is most productive.

Site Name: American Creosote Works, Jackson Plant **EPA ID No.:** TND007018799
Interviewer Name: Donnie A. Sprinkle **Affiliation:** TDEC
Subject's Name: Drew Newmon **Affiliation:** Dement Construction
Subject's Contact Information: 731-424-7348
Time: 10:28AM **Date:** March 13, 2014
Type of Interview (Circle one): In Person **Phone** Mail Other_____
Location of Interview: Phone

Site Owners – Dement Construction Office Manager

1. What is your overall impression of the remedial activities at the site?
   Very good.

2. What effect has this site had on the surrounding community, if any?
   The place is nice now, and before it was a dump. The site looks totally different than it did 10 years ago.

3. How well do you believe the remedy currently in place is performing?
   Pretty good.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
   None.

5. What is the frequency of Operation & Maintenance (O&M) activities and inspections at the site? To your knowledge has the maintenance been implemented as intended?
   I don't go along with TDEC when they come to the site, but know when they test.

6. Have the institutional control requirements been implemented and enforced as designed?
   Not aware of them.

7. What effect has the reuse of the site had on the community? Are you aware of any changes in projected land use?
   Reuse has been good for community

8. Do you feel well informed about the site's activities and progress? If not, what other methods of conveying information should EPA use?
   Don Sprinkle keeps me well informed.

9. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
   No, everything seems to be going smoothly.

Site Name: American Creosote Works, Jackson Plant EPA ID No.: TND007018799
Interviewer Name: Donnie A. Sprinkle Affiliation: TDEC
Subject's Name: Resident 1 Affiliation: Area Resident
Subject's Contact Information:
Time: 10:30AM Date: March 13, 2014
Type of Interview (Circle one): In Person Phone Mail Other_____
Location of Interview: Phone

Area Resident

1. What is your overall impression of the remedial activities at the site?
Resident thinks the cleanup has gone well but wishes it would go faster.

2. What effect has this site had on the surrounding community, if any?

Only positive effects, as the site looks much better and is on the tax roll.

3. How well do you believe the remedy currently in place is performing?

The resident thinks the remedy is performing well but is aware that more work is needed.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

The resident was unaware of any inquiries or complaints.

5. What effect has the reuse of the site had on the community? Are you aware of any changes in projected land use?

   The cleanup has helped beautify the area, due to Dement and JEA putting the site into reuse.

6. Do you feel well informed about the site's activities and progress? If not, what other methods of conveying information should EPA use?

   Resident would like to be kept more informed, possibly by newsletter or more frequent meetings.

7. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   Resident has no further comments, and is appreciative of what EPA is doing to keep area residents safe.

Site Name: American Creosote Works, Jackson Plant **EPA ID No.:** TND007018799
Interviewer Name: Donnie A. Sprinkle **Affiliation:** TDEC
Subject's Name: Kevin Atkins (HMP Home Medical Products) **Affiliation:** Nearby business employee
Subject's Contact Information: hmpinc@hmpinc.net
Time: 10:30AM **Date:** May 22, 2014
Type of Interview (Circle one): In Person Phone Mail Other_____
Location of Interview: HMP Inc. office

Area Resident

1. What is your overall knowledge of the site?
   Mr. Atkins was not aware of the site being an inactive hazardous waste site.

2. What is your overall impression of the remedial activities at the site?
   After reading the synopsis of site activities provided him, he was grateful that soil cleanup actions have taken place and glad the site is being reused.

3. What effect has this site had on the surrounding community, if any?
   Mr. Atkins' business is new to the area and he really didn't have anything to comment on as far as what the site looked like before and what kind of effect it has had on the community.

4. How well do you believe the remedy currently in place is performing?

   Mr. Atkins thinks that the soil cleanup has gone well since there are workers on site with no threat of adverse health effects from past site contamination.

5. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   Mr. Atkins was unaware of any inquiries or complaints.

6. Do you feel well informed about the site's activities and progress? If not, what other methods of conveying information should EPA use?

   Mr. Atkins provided me his business email address and would welcome any site updates.

7. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   Mr. Atkins has no further comments.

Site Name: American Creosote Works, Jackson Plant **EPA ID No.:** TND007018799
Interviewer Name: Donnie A. Sprinkle **Affiliation:** TDEC
Subject's Name: Kathleen Huneycutt **Affiliation:** City of Jackson
Subject's Contact Information: 731-425-8612
Time: 9:10AM **Date:** June 4, 2014
Type of Interview (Circle one): In Person **Phone** Mail Other_____
Location of Interview: Phone

Site Owners – Dement Construction Office Manager

1. What is your overall knowledge of the site?

   I know that the place is a hazardous waste site and have known about the site all my life.

2. What effect has this site had on the surrounding community, if any?

   You could smell creosote all over town when they were operating.

3. How well do you believe the remedy currently in place is performing?

   Good to have the property in productive use again. Glad Dement Construction is there.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   None.

5. What effect has the reuse of the site had on the community?

   Getting the site on the tax rolls is good for the city and county, and the place looks much nicer now.

6. Do you feel well informed about the site's activities and progress? If not, what other methods of conveying information should EPA use?

   I would like to be updated on future work at the site.

7. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   None.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: American Creosote Works (Jackson Plant)	**Date of inspection: March 19, 2014**
Location and Region: Jackson, TN; Region 4	**EPA ID:**
Agency, office, or company leading the five-year review: EPA Region 4	**Weather/temperature: Partly cloudy/breezy in the 50s.**

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other _____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ Name _____ Title mm/dd/yyyy Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ Name _____ Title mm/dd/yyyy Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.

Agency Tennessee Department of Environment and Conservation
Contact Don Sprinkle (Name) | Project Manager (Title) | 03/19/14 (Date) | 731-512-1328 (Phone No.)
Problems; suggestions; ☐ Report attached see Appendix C

Agency _____
Contact _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems; suggestions; ☐ Report attached see Appendix C

Agency _____
Contact _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems; suggestions; ☐ Report attached see Appendix C

Agency _____
Contact _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems; suggestions; ☐ Report attached see Appendix C

4. **Other interviews** (optional) ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

4.	**Permits and Service Agreements**				
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Other permits _____	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☒ Readily available	☐ Up to date	☐ N/A	
	Remarks: Groundwater monitoring results from Jan 2005, 2008 and 2012 available in provided reports.				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				

IV. O&M COSTS

1.	**O&M Organization**	
	☒ State in-house	☒ Contractor for State
	☐ PRP in-house	☐ Contractor for PRP
	☐ Federal Facility in-house	☐ Contractor for Federal Facility
	☐ _____	

2. **O&M Cost Records**

☒ Readily available ☒ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate $100,000/year ☐ Breakdown attached

Total annual cost by year for review period if available

From 01/01/2009	To 12/31/2009	$0	☐ Breakdown attached
Date	Date	Total cost	
From 01/01/2010	To 12/31/2010	$0	☐ Breakdown attached
Date	Date	Total cost	
From 01/01/2011	To 12/31/2011	$50,135	☐ Breakdown attached
Date	Date	Total cost	
From 01/01/2012	To 12/31/2012	$92,068	☐ Breakdown attached
Date	Date	Total cost	
From 01/01/2013	To 12/31/2013	$0	☐ Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: ____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: There is a break in the fence where the drainage ditch drains into Central Creek. The Site could be accessed by traveling in the creek bed as the fence does not cover the creek bed.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks: Signage on fences.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) ____

Frequency ____

Responsible party/agency State of Tennessee DEC-DOR

Contact TDEC ____ mm/dd/yyyy ____

Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: Groundwater use restrictions are not in place and contaminated groundwater is moving off site.

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: ____

2. **Land use changes on site** ☐ N/A

Remarks: Property has been put into reuse. Dement Construction has placed a gravel pad over the capped area and stores equipment there. Buildings have also been erected on site.

3. **Land use changes off site** ☒ N/A

Remarks: ____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. Roads damaged ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: Roads are accessible with four-wheel drive.

B. Other Site Conditions

Remarks: The western portion of the Site between the cap and the fence holds standing water at all times except during drought conditions.

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1.	**Settlement** (Low spots)	☐ Location shown on site map	☒ Settlement not evident
	Arial extent _____		Depth _____
	Remarks: _____		
2.	**Cracks**	☐ Location shown on site map	☒ Cracking not evident
	Lengths _____	Widths _____	Depths _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Arial extent _____		Depth _____
	Remarks: Erosion is evident on the very edge of the filled area, and as additional fill is placed it will be gradually sloped to prevent further erosion. Eroded area is several hundred feet from the cap.		
4.	**Holes**	☐ Location shown on site map	☒ Holes not evident
	Arial extent _____		Depth _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/Shrubs (indicate size and locations on a diagram)	
	Remarks: No vegetative cover. Capped area is covered by several feet of fill material and gravel.		
6.	**Alternative Cover** (armored rock, concrete, etc.)		☐ N/A
	Remarks: Capped area is covered with gravel bed.		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Arial extent _____		Height _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent _____
	☐ Ponding	☐ Location shown on site map	Arial extent _____
	☐ Seeps	☐ Location shown on site map	Arial extent _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Arial extent _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		

1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☒ N/A
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Arial extent _____		Depth _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type_____		Arial extent _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Arial extent _____		Depth _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Arial extent _____		Depth _____
	Remarks: _____		
5.	**Obstructions**	Type _____	☐ No obstructions
	☐ Location shown on site map	Arial extent _____	
	Size _____		
	Remarks: _____		
6.	**Excessive Vegetative Growth**	Type _____	
	☐ No evidence of excessive growth		
	☐ Vegetation in channels does not obstruct flow		
	☐ Location shown on site map	Arial extent _____	
	Remarks: _____		
D. Cover Penetrations		☐ Applicable	☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks: _____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks: _____

4. **Extraction Wells Leachate**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent _____ Depth _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent _____ Depth _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement _____ Vertical displacement _____

Rotational displacement _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident

Area extent _____ Depth _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☒ Vegetation does not impede flow

Area extent _____ Type _____

Remarks: There is some vegetative growth in ditch, but does not appear to impede flow.

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

Area extent _____ Depth _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☒ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent _____ Depth _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring _____

☐ Performance not monitored

Frequency _____ ☐ Evidence of breaching

Head differential _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps, and Electrical**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters _____

☐ Additive (e.g., chelation agent, flocculent) _____

☐ Others _____

☐ Good condition ☐ Needs Maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually _____

☐ Quantity of surface water treated annually _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs Maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring data suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks: Monitoring wells should be secured and wells that are no longer in use should be abandoned appropriately. Wells should also be sampled quarterly.

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
Contaminated soils and structures were treated and placed into a landfill on site. The landfill was then capped and the cap is now further covered by a large gravel bed that extends beyond the boundaries of the cap. ICs are in place to protect the cap and preclude inappropriate land and groundwater use.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
Contaminated groundwater is possibly migrating off site, either by groundwater flow or entrance into the surface water pathway.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.
Contaminated groundwater is being monitored and is possibly moving off site. A limited site RI is being planned for the immediate future, in hopes of answering questions about the groundwater-surface water relationship and the threat of contaminants moving off site.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Site Inspection Team:
Don Sprinkle, TDEC

Appendix E: Photographs from Site Inspection Visit

Entrance and Dement Construction building at 318 Meadow St.

Entrance into Site. Approval required for site access. Gates are closed and secured at end of business day.

Graveled storage area extended beyond cap with equipment storage.

Looking across the Site from south to north.

Break in fence to allow drainage ditch to drain into Central Creek.

Monitoring well 2D being reparied.

Eastern side of site with graveled equipment storage in background.

JEA portion of Site at 315 Meadow St. Looking east.

Sheen on Central Creek. Just south of southwest corner of site.

Appendix F: Historical Groundwater Data

Table 12: Historical Groundwater Sampling Results

	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
Well	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
TP-1	03/08/05	NS	NS	NS	540	<1200	<250	<250	<250	<250	<250	<250	2,200	<250	NS	2,200
	12/17/04	<20.0	29	<20.0	<500	<500	<500	<500	<500	<500	<500	<500	2,100	<500	NS	2,200
	06/23/04	6.2	48	<5.0	480	<10	<10	<10	<10	<10	45	200	<10	26	NS	3,300
21S	03/15/05	NS	NS	NS	490	<200	<200	<200	<200	<200	<200	230	2,300	<200	NS	<200
21M	03/15/05	NS	NS	NS	540	<100	<100	<100	<100	<100	<100	260	1,300	<100	NS	560
22S	03/08/05	NS	NS	NS	430	<50	<50	<50	<50	<50	<50	180	560	<50	NS	<50
22M	03/15/05	NS	NS	NS	36	<10	<10	<10	<10	<10	<10	14	<10	<10	NS	<10
24S	03/08/05	NS	NS	NS	280	<50	<50	<50	<50	<50	<50	140	69	<50	NS	<50
24M	03/08/05	NS	NS	NS	110	<10	<10	<10	<10	<10	30	69	77	18	NS	120
23/28S	03/17/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
23/28 M	03/17/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
23/28 D	03/17/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
Duplicate (23/28D)	03/17/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
25S	03/10/05	NS	NS	NS	1,000	<10	<10	<10	<10	<10	14	29	4,700	<10	NS	7,200
25M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
25D	03/10/05	NS	NS	NS	850	<10	<10	<10	<10	<10	77	320	10,000	40	NS	520
27S	03/10/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
27M	03/10/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	NS	<10
Duplicate (27M)	03/10/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
29S	03/11/05	NS	NS	NS	840	<10	<10	<10	<10	<10	11	260	4,600	<10	NS	4,500
29M	03/11/05	NS	NS	NS	95	<10	<10	<10	<10	<10	<10	37	48	<10	NS	430

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
Duplicate (29M)	03/11/05	NS	NS	NS	92	<10	<10	<10	<10	<10	<10	35	50	<10	NS	490
29D	03/11/05	NS	NS	NS	93	<10	<10	<10	<10	<10	73	75	48	37	NS	92
30S	03/14/05	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	<10
31S	03/16/05	NS	NS	NS	650	<500	<500	<500	<500	<500	<500	<500	3,200	<500	NS	2,000
31M	03/16/05	NS	NS	NS	1000	<500	<500	<500	<500	<500	<500	<500	4,900	<500	NS	2,100
31D	08/19/05	NS	NS	NS	460	<10	<10	<10	<10	<10	19	150	6,200	<10	NS	1,700
	03/16/05	NS	NS	NS	630	<500	<500	<500	<500	<500	<500	<500	5,900	<500	NS	<500
Duplicate (31D)	03/16/05	NS	NS	NS	530	<500	<500	<500	<500	<500	<500	<500	4,600	<500	NS	<500
1S	Jan 87-Oct88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1M	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1D	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2S	02/09/09	11.4	34.7	ND	282	ND	ND	ND	ND	ND	2.85	87.7	1,440	0.72	108	185
	08/19/05	NS	NS	NS	440	<10	<10	<10	<10	<10	<10	100	3,800	<10	NA	800
	12/01/04	78	45	<1.0	440	<400	<400	<400	<400	<400	<400	<400	2,500	<400	<400	<400
	06/03/04	24	20	<10	64	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	21	150	<10.0	NA	<10.0
	03/24/03	10	5.2	<5.0	77	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	29	150	<10.0	32	<10.0
	07/12/02	<50	<50	<50	210	<100	<100	<100	<100	<100	<100	<100	890	<100	<100	<100
	01/17/02	<250	<250	<250	330	<200	<200	<200	<200	<200	<200	<200	2,400	<200	<200	<200
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,160	ND	ND	ND
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2M	08/19/05	NS	NS	NS	340	<10	<10	<10	<10	<10	<10	120	5,500	<10	NA	120
	12/01/04	18	4	<1.0	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	7,900	<2000	<2000	<2000
	06/03/04	<200	<200	<200	120	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	38	870	<10.0	NA	110

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
	03/24/03	18	12	<5.0	67	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	29	1,200	<10.0	41	100
	07/12/02	<250	<250	<250	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	3,500	<1000	<1000	<1000
	01/17/02	<250	<250	<250	<200	<200	<200	<200	<200	<200	<200	<200	3,000	<200	<200	<200
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,340	ND	ND	320
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2M-A	01/22/08	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	0.98	ND	ND	22
	10/06/05	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
2D	12/01/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	06/03/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	<10.0
	03/24/03	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	07/12/02	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	01/17/02	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	05/17/01	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2D-A	01/21/08	ND	NA	NA	ND	ND	ND	NA	ND	ND	ND	ND	1.5	ND	ND	22
Duplicate 2D-A	01/21/08	ND	NA	NA	1.7	ND	ND	NA	ND	ND	ND	0.88	1.9	5.4	1.2	ND
2D-A	10/06/05	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
3S	Jan 87-Oct 8B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3M	Jan 87-Oct 88	NA	NA	NA,	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3D	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4S	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4M	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
4D	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5S	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5M	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5D	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA-	NA	NA
9	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	11/30/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	06/04/04	<1.0	<1.0	<1.0	22	<10	<10	<10	<10	<10	<10	14	<10	<10	NA	230
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10X		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11X		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
12	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	12/01/04	<5.0	15.0	5.0	400	<100	<100	<100	<100	<100	140	200	<100	120	140	300
	06/07/04	<1.0	<100	<1.0	6,600	<4,000	<4,000	<4,000	<4,000	<4,000	5,600	5,000	<4,000	<4,000	NA	<4,000

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
	03/24/03	<1.0	15.0	<1.0	130	12	<10.0	<10.0	<10.0	12	77	33	<10.0	45	34	1,200
	07/12/02	<50	<50	<50	1,400	<1000	<1000	<1000	<1000	<1000	1,200	<1000	1,400	<1000	<1000	1,300
	01/17/02	<100	<100	<100	7,800	1,600	<1000	<1000	<1000	1,400	8,800	5,700	5,300	5,500	4,400	4,000
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	11/30/04	98	30	<1.0	<500	<500	<500	<500	<500	<500	<500	<500	520	<500	<500	2,900
	06/03/04	120	39	<10	670	73	66	<10	33	48	470	440	590	420	NA	2,700
	03/24/03	120	76	<50.0	2,600	<1000	<1000	<1000	<1000	<1000	2,400	1,700	4,700	1,700	1,600	3,200
	07/12/02	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	2,400	<100	<100	3,100
	01/17/02	1,500	<1000	<1000	5,200	1,000	<1000	<1000	<1000	<1000	5,800	3,800	4,800	3,600	3,000	5,200
	05/17/01	ND	ND	ND	6,940	ND	ND	1,120	ND	1,240	6,840	4,490	7,650	6,630	4,080	ND.-
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	11/30/04	18	22	<1.0	1,000	<200	<200	<200	<200	<200	700	600	1,000	490	510	<200
	06/03/04	<25	<25	<25	730	100	100	<10	45	77	570	610	460	570	NA	<10
	03/24/03	18	19	<5.0	4,800	1,100	<1000	<1000	<1000	<1000	6,300	3,800	3,100	4,000	3,300	<1000
	01/17/02	<250	<250	<250	5,800	1,500	<1000	<1000	<1000	1,300	8,400	4,900	3,800	4,800	3,700	<1000
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	06/04/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	<10
	Jan 87-Oct 88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19S	11/30/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0 '	<10.0
	06/03/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	<10.0
	03/24/03	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	07/12/02	<1	<1	<1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	01/17/02	<1	<1	<1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	ND	ND

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
19M	11/30/04	<1.0	1.2	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	06/03/04	<1.0	<1.0	<1.0	10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	38	<10.0	NA	<10.0
	03/24/03	<1.0	<1.0	<1.0	10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	07/12/02	<1	<1	<1	17	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	42	<10.0	10	<10.0
	01/17/02	<1	<1	<1	17	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	14	39	<10.0	<10.0	29
	05/17/01	ND	ND	ND	23	ND	ND	ND	ND	ND	ND	17	38	ND	13	ND
20S	11/30/04	16	8.1	<1.0	<800	<800	<800	<800	<800	<800	<800	<800	<800	<800	<800	4,400
	06/03/04	23	13	<10	180	15	12	<10	<10	13	110	66	120	75	NA	760
	03/24/03	73	94	<50.0	2,800	460	300	140	180	420	2,500	1,800	3,700	1,800	1,800	4,400
	07/12/02	86	<50	<50	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	1,900	<1000	<1000	5,800
	01/17/02	<25	<25	<25	<500	<500	<500	<500	<500	<500	<500	<500	1,300	<500	<500	3,800
	05/17/01	ND	ND	ND	969	ND	ND	ND	ND	ND	ND	ND	1,990	ND	510	4,950
20M	11/30/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	06/04/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	8.6	<10	NA	<10
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<25	<25	<25	21	<10	<10	<10	<10	<10	<10	11	33	<10	11	22
	05/17/01	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND
32	10/06/05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
33	01/22/08	4.7	NA	NA	39	ND	ND	NA	ND	ND	ND	15	720	ND	23	38
	10/06/05	<10	<10	<10	46	<10	<10	<10	<10	<10	<10	11	900	<10	<10	17
34	01/21/08	0.56	NA	NA	390	2.4	1.1	NA	0.99	2.2	26	ND	2000	16	160	730
	10/06/05	<10	<10	<10	400	<10	<10	<10	<10	<10	12	170	690	<10	<10	<10
35	01/22/08	ND	NA	NA	2	ND	ND	ND	ND	ND	4	2	2	2.5	1.3	ND
	10/06/05	<10	<10	<10	140	<10	<10	<10	<10	<10	<10	42	130	<10	<10	<10
OSGW 1-1		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
OSGW 1-2		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
OSGW 1-3		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
OSGW 1-4		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
OSGW 1-5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
OSGW 1-6		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
OSGW 2-1	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 2-2	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 2-3	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 2-4	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 2-5	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 2-6	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 3-1	12/01/04	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10
	06/04/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	<10
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 3-2	12/01/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	06/04/04	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	<10.0
	03/24/03	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 3-3	12/01/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
	06/04/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	<10
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 3-4	12/01/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	06/04/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	<10
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 3-5	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 3-6	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 4-1	02/10/09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	11/29/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	06/03/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	<10
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	27	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/01/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	NA	NA	NA
OSGW 4-2	2/10/2009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.36
	11/29/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	06/03/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	48
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	63

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
	05/17/01	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	113	ND	ND	232
	10/01/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	NA	NA	NA
OSGW 4-3	08/19/05	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	11/29/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/01/92	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 4-4	08/19/05	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	11/29/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	2,200	<10	<10	<10
	06/03/04	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	<10
	03/24/03	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	01/17/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 4-5	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 4-6	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 5-1	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 5-2	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 5-3	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	01/01/93	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/01/92	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 5-4	07/12/02	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Well	Sample Date	Benzene	1,2,4-Trimethylbenzene	Vinyl Chloride	Acenapthene	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)pyrene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Pyrene	Dibenzofuran	Pentachlorophenol
	MCLs for Drinking Water (µg/L)	5 (µg/L)	NA	2 (µg/L)	NA	NA	NA	NA	0.2 (µg/L)	NA	NA	NA	NA	NA	NA	1 (µg/L)
OSGW 5-5	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 5-6	05/17/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OSGW 6-1	10/01/92	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 6-2	10/01/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 6-3	10/01/92	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 6-4	10/01/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 6-5	10/01/92	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OSGW 6-6	01/01/93	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/01/92	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Available
ND = Not detected (below laboratory detection limits)
NS = Not Sampled

Appendix G: Deed Restrictions

This instrument prepared by
The Tennessee Department
of Environment and Conservation
Office of General Counsel
25th Floor, Tennessee Tower
Nashville, Tennessee 37243-1548

"CORRECTED" NOTICE OF LAND USE RESTRICTIONS

Notice is hereby given that pursuant to T.C.A. Section 68-212-225 of the *Hazardous Waste Management Act of 1983*, the Commissioner of the Tennessee Department of Environment and Conservation ("TDEC") has determined that land use restrictions are an appropriate remedial action at the below-described property. Pursuant to T.C.A. Section 68-212-225(d) the register of deeds shall record this Notice and index it in the grantor index under Jackson Energy Authority.

Witnesseth:

WHEREAS, the Grantor is the owner of the real property described in a Deed of record with the Madison County Register of Deeds as Instrument No., 648, page 269 herein after referred to as the "Property," and,

WHEREAS, the Property has been remediated, to the extent practicable, consistent with the National Contingency Plan and to levels protective of human health and the environment in a commercial/industrial area; and,

WHEREAS, the Grantor has agreed to impose certain land use restrictions on the Property as set forth hereinafter and has agreed to preserve and maintain these restrictions.

NOW, THEREFORE, in consideration of the foregoing, the Grantor hereby declares that the Property should be held, sold, and conveyed subject to the following land use restrictions. Said land use restrictions shall run with the land and shall be binding on all parties having any right, title, or interest in the Property or any part thereof, their heirs, successors, successors-in-title, and assigns, and shall inure to the benefit of each owner thereof and to TDEC and the respective successors and assigns of such parties:

Location of Contamination

Approximately 7 acres of solidified soil is buried and capped in the north central portion of the former American Creosote Works site. The following coordinates encompass the capped area. The northwest coordinates are 35° 36' 42.63" N-088° 50' 14.24" W, northeast coordinates are 35° 36' 39.10" N- 088° 50' 6.39" W, southeast corner coordinates are 35° 36' 34.34"N-088° 50' 7.07"W, and the southwest corner's coordinates are 35°, 36' 34.68"N-088° 50' 14.28"W. The soil

was solidified/stabilized in 1999 during the remedial action at the site, intended to eliminate the human contact pathway in the heavily contaminated former process area of the site. Contaminated soil was excavated from the former process area, mixed with carbon, Portland cement, and fly ash to solidify and stabilize the contaminants, then placed back in the excavated area and capped using a geosynthetic liner, 18 inches of clay, and six inches of topsoil to eliminate the infiltration of rainwater through the capped material. The area was then seeded with locally hearty grass to reduce or eliminate erosion. Contaminants identified in the former process area soil included pentachlorophenol (PCP), benzo(a)pyrene, benzo(a)anthracene, chrysene, naphthalene, and dioxins.

Land Use Restrictions:

Prior to any part of the Property being used for a residence, domicile, daycare, school, or church with an outdoor playground, the Grantor, its successors, and/or assigns must notify TDEC and must demonstrate to the satisfaction of TDEC that any such proposed use listed above will not pose a danger to public health, safety, or the environment. Prior to the removal of soil underlying the buildings on the Property, the Grantor, its successors, and/or assigns must notify TDEC and must demonstrate to the satisfaction of TDEC that any such proposed soil removal will not pose a danger to public health, safety, or the environment. Any approval granted by TDEC for the restricted uses shall be in writing, must contain a reference to this instrument, and shall be filed with the Madison County Register of Deeds.

The Grantor, its successors, and/or assigns must notify TDEC prior to any invasive activity which could compromise the integrity of any caps or covers present on the property. Notification must be made for any invasive activities that may generate fugitive dust, including soil borings or potable groundwater wells, on the Property. The Grantor, its successors, and/or assigns must demonstrate to the satisfaction of TDEC, through sampling and analysis or other means approved by TDEC, that any invasive activity will not pose a danger to public health, safety, or the environment or cause a release of hazardous substances or other pollutants. Any approval granted by TDEC for the restricted uses shall be in writing, must contain a reference to this instrument, and shall be filed with the Madison County Register of Deeds.

Enforcement

Any owner of the land or any unit of local government having jurisdiction over any part of the subject property may enforce this Notice of Land Use Restrictions by means of a civil action. The Commissioner of TDEC may enforce this Notice of Land Use Restrictions through the issuance of an Administrative Order or by means of a civil action, including one to obtain an injunction against present or threatened violations of the restriction. Pursuant to T.C.A. Section 68-212-213, any person who fails, neglects or refuses to comply with a land use restriction

commits a Class B misdemeanor and is subject to the assessment of a civil penalty of up to ten thousand dollars ($10,000) per day.

Term

This Notice of Land Use Restrictions shall run with and bind the Property unless/until this Declaration shall be made less stringent or canceled as set forth under the paragraph entitled "Amendment and Termination."

Amendment and Termination

This Notice of Land Use Restrictions may be made less stringent or canceled by the Commissioner of TDEC if the risk has been eliminated or reduced so that less restrictive land use controls are protective of human health and the environment. . No amendment to or termination of this Notice of Land Use Restrictions shall be effective until such amendment or instrument terminating this Notice of Land Use Restrictions is recorded by the Madison County Register of Deeds.

Severability

Invalidation of any of these covenants or restrictions by judgement or count order shall in no way affect any other provisions, which shall remain in full force and effect.

IN WITNESS WHEREOF, the undersigned has executed this instrument this 7th day of July 2005.

BK/PG:T1687/167-169

05013436

3 PGS : RE - RESTRICTIONS	
SHARLA DATCH: 20843	
07/13/2005 - 11:00 PM	
VALUE	0.00
MORTGAGE TAX	0.00
TRANSFER TAX	0.00
RECORDING FEE	15.00
DP FEE	2.00
REGISTER'S FEE	0.00
TOTAL AMOUNT	17.00

STATE of TENNESSEE, MADISON COUNTY

JACKSON ENERGY AUTHORITY

By: John W. Williams
Title: President and CEO

Before me, the undersigned Notary Public in and for the State aforesaid, personally appeared John W. Williams and by his signature executed the foregoing instrument for the purpose therein contained.

WITNESS, this 7th day of July, 2005.

APRIL BERKLEY NOTARY PUBLIC AT LARGE MADISON CO. TENNESSEE

Notary Public

MY COMMISSION EXPIRES SEPT. 18, 2005

Commission Expiration