

**First Five-Year Review Report  
for the  
Conroe Creosoting Company Superfund Site  
Conroe, Montgomery County, Texas**

**September 2008**



**Prepared by:**

**United States Army Corps of Engineers  
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**Prepared for:**

**United States Environmental Protection Agency  
Region 6  
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**FIRST FIVE-YEAR REVIEW  
CONROE CREOSOTING COMPANY SUPERFUND SITE  
EPA ID# TXD008091951  
Conroe, Montgomery County, Texas**

This memorandum documents the United States Environmental Protection Agency's (EPA) performance, determinations, and approval of the Conroe Creosoting Company Superfund Site First Five-Year Review, provided in the attached First Five-Year Review Report prepared by the United States Army Corps of Engineers on behalf of EPA.

**Summary of Five-Year Review Findings**

The results of the Five-Year Review indicate that the chosen remedy is protective of human health and the environment in the short term because there is no evidence that there is current exposure. The following deficiencies were noted that potentially impact the long-term protectiveness of the remedy.

- No Operation and Maintenance Plan for the Resource Conservation and Recovery Act (RCRA) vault is in place.
- The RCRA vault is in immediate need of repair.
- No comprehensive long-term groundwater plan is in effect.
- Institutional controls, required by the Record of Decision, have not been implemented.

**Actions Needed**

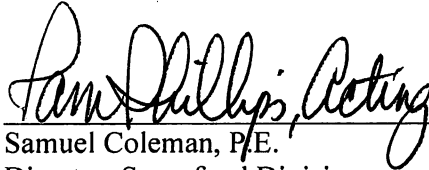
The actions listed below need to be implemented to ensure that the remedy remains protective for the long term.:

- Create and implement an Operation and Maintenance Plan for the RCRA vault
- Immediately repair erosional channels on RCRA vault sidewalls and re-establish a vegetative cover on the cap.
- Create and implement a comprehensive groundwater monitoring program, based on updated, comprehensive analytical data.

- The required institutional controls, consisting of a deed notice, should be filed with the County of Montgomery at the earliest opportunity followed by notification to the regulators.

**Determinations**


I have determined that the remedy for the Conroe Creosoting Superfund Site is protective of human health and the environment in the short term. The remedy will remain protective in the long term provided the action items identified in the Five-Year Review Report are addressed.

  
\_\_\_\_\_  
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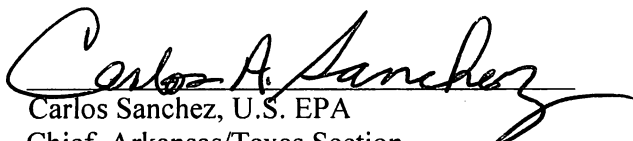
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FIRST FIVE-YEAR REVIEW  
Conroe Creosoting Company Superfund Site  
EPA ID# TXD008091951

  
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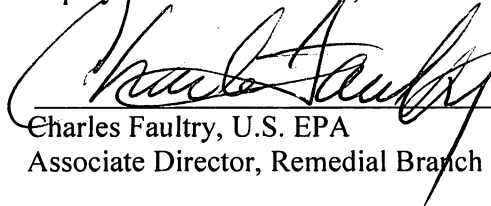
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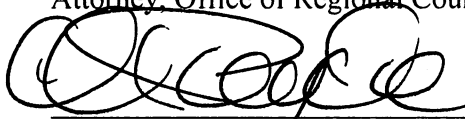
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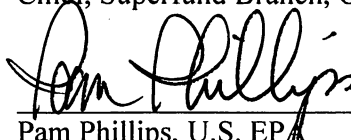
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# Table of Contents

Section	Page
<b>1.0 INTRODUCTION</b> .....	<b>1</b>
<b>2.0 SITE CHRONOLOGY</b> .....	<b>2</b>
<b>3.0 BACKGROUND</b> .....	<b>2</b>
3.1 PHYSICAL CHARACTERISTICS.....	2
3.2 LAND AND RESOURCE USE .....	5
3.3 HISTORY OF CONTAMINATION .....	6
3.4 INITIAL RESPONSE .....	7
3.5 SUMMARY OF BASIS FOR TAKING ACTION .....	9
<b>4.0 REMEDIAL ACTIONS</b> .....	<b>10</b>
4.1 REMEDY OBJECTIVES .....	10
4.2 REMEDY SELECTION .....	11
4.3 REMEDY IMPLEMENTATION .....	13
4.4 OPERATIONS AND MAINTENANCE .....	15
<b>5.0 FIVE-YEAR REVIEW PROCESS</b> .....	<b>16</b>
5.1 COMMUNITY INVOLVEMENT .....	17
5.2 DOCUMENT REVIEW.....	17
5.3 DATA REVIEW .....	17
5.4 INTERVIEWS .....	20
5.5 SITE INSPECTION .....	20
<b>6.0 TECHNICAL ASSESSMENT</b> .....	<b>21</b>
6.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS? .....	21
6.2 QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES (RAOs) USED AT THE TIME OF THE REMEDY SELECTION STILL VALID? .....	23
6.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY? .....	24
<b>7.0 ISSUES</b> .....	<b>24</b>
<b>8.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS</b> .....	<b>25</b>
<b>9.0 PROTECTIVENESS STATEMENT</b> .....	<b>26</b>
<b>10.0 NEXT REVIEW</b> .....	<b>27</b>

## **List of Figures**

Figure 1	Conroe Superfund Site Location Map
Figure 2	Conroe Superfund Site Plan
Figure 3	Conroe Superfund Site Potentiometric Surface, SAND -1
Figure 4	Conroe Superfund Site ESA Divisions
Figure 5	Conroe Superfund Site Waste Pit Locations
Figure 6	Conroe Superfund Site Well Locations
Figure 7	Conroe Superfund Site PCP Plume, 2003
Figure 8	Conroe Superfund Site PCP Plume, 2006

## **List of Tables**

Table 1	Chronology of Site Events
Table 2	2003 Groundwater PCP Concentrations
Table 3	2005 and 2006 Groundwater PCP Concentrations

## **Attachments**

Attachment 1	Documents Reviewed
Attachment 2	Interview Record Forms
Attachment 3	Site Inspection Checklist
Attachment 4	Site Inspection Photographs
Attachment 5	Notice to the Public Regarding the Five-Year Review

## List of Acronyms

µg/L	micrograms per liter
ARARs	Applicable or Relevant and Appropriate Requirements
AST	aboveground storage tank
bgs	below ground surface
CCA	copper chromated arsenate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituent of concern
COPC	constituent of potential concern
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESI	Expanded Site Investigation
FS	Feasibility Study
GP	Groundwater Protection
ISCO	in situ chemical oxidation
MCL	Maximum Contaminant Level
mg/kg-day	milligrams per kilograms per day
MNA	Monitored Natural Attenuation
msl	mean sea level
MW	Monitoring Well
NAPL	Non-Aqueous Phase Liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCP	pentachlorophenol
RA	Remedial Action
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
START-2	Superfund Technical Assessment and Response Team
SVOC	semivolatile organic compound
TCEQ	Texas Commission on Environmental Quality
USACE	U.S. Army Corps of Engineers
VOC	Volatile Organic Compound

## Executive Summary

The U.S. Environmental Protection Agency Region 6 (EPA) conducted the first five-year review of the remedial action (RA) implemented at the Conroe Creosoting Superfund site in Conroe, Montgomery County, Texas. The purpose of the five-year review is to determine whether the selected remedy for the site continues to protect human health and the environment. This review was conducted from April through September 2008, and its findings and conclusions are documented in this report.

The EPA conducted a Time Critical Removal Action from September 3, 2002 to September 22, 2003. The removal action included the removal of the on-site process equipment and their contents; excavation/solidification of contaminated soil, and construction of a Resource Conservation Recovery Act (RCRA) vault. A total of 252,000 cubic yards of contaminated material was placed inside the vault. Post removal soil samples were collected throughout the site to characterize existing on-site soils.

The Record of Decision (ROD), signed on September 29, 2003, set forth the selected remedy for the site, which includes monitored natural attenuation of the constituents of concern in the groundwater, no further action for the on-site soils and offsite sediments, long-term maintenance of the RCRA vault, and placement of institutional controls. The remedy was designed and implemented, and EPA conducted the final site inspection for the site and issued the Preliminary Close Out Report on September 30, 2003.

EPA has conducted two pilot studies to evaluate the effectiveness of chemical oxidants to reduce pentachlorophenol (PCP) contamination in the groundwater. The first pilot test conducted in October 2006 was unsuccessful in treating PCP due to difficulties injecting the chemical oxidant. A supplemental pilot study was conducted in June 2008 and groundwater samples were collected in August 2008 to evaluate the effectiveness of the pilot study. Results from the groundwater sampling will be available in September 2008.



The assessment of this five-year review found that the remedy for the Conroe Creosoting Superfund Site is protective of human health and the environment in the short term; however, several action items need to be implemented so that the remedy will remain protective in the long term.

Deficiencies identified in this five-year review include the following:

1. **RCRA Vault Maintenance** - The RCRA vault has not been maintained consistent with the intent of the ROD and there is no Operation and Maintenance (O&M) Plan for maintaining the RCRA vault. The only maintenance performed on the vault during the five year period occurred in the fall of 2007 with removal of woody growth from the surface cap, surface cap damage repaired, and measuring and sampling of the leachate within the leachate collection system. No documentation is available for this event. Presently, little to no vegetative cover is present over the entire vault area. Extensive erosional channels are evident along the entire extent of the vault's sidewalls. The depth of these channels average one foot deep; some are as deep as two feet. Landfill cover geotextiles are visible at approximately 30 locations due to this erosion.
2. **Groundwater Monitoring** – A comprehensive groundwater monitoring plan was not available as required in the ROD. Only three groundwater sampling events have taken place since the ROD was signed. The lack of groundwater samples makes it difficult to determine the effectiveness of the monitored natural attenuation remedy.
3. **Institutional Controls** - The institutional controls required in the ROD have not been implemented. The ROD required the placement of appropriate institutional controls to ensure that any future land owners will be notified that the land was a former Superfund site and hazardous substances remaining on-site in the groundwater are above health-based concentration levels; prevent future installation of water supply wells at the Site; and restrict future redevelopment of the property to non-residential use based on contaminant concentrations remaining in the surface soils.

The following actions are recommended in response to these issues:

1. Create and implement an O&M Plan for the RCRA vault.
2. Repair erosion channels on RCRA vault sidewalls and re-establish a vegetative cover on the cap.
3. Create and implement a comprehensive groundwater monitoring program, based on updated, comprehensive analytical data.
4. Implement the institutional controls required by the ROD.



## Five-Year Review Summary Form, cont'd.

### Issues:

**Regarding the RCRA vault:** There is currently little to no vegetative cover on the cap. The sidewalls contain numerous erosional channels up to two feet in depth. As a result of the sidewall erosion, vault geotextiles are exposed in approximately 30 locations. There are also large gaps between the bottom of the vault fencing and ground surface, due to erosion. There is no current Operation and Maintenance Plan to address the cap maintenance or leachate collection system.

**Regarding the Groundwater:** A comprehensive groundwater monitoring program needs to be implemented, based on updated, comprehensive analytical data. Currently, only a portion of the groundwater network is being monitored; those wells being sampled are only analyzed for semivolatile organic compounds. The current sampling strategy is based on the 2003 Remedial Investigation limited groundwater data which was inadequate. Currently, pentachlorophenol (PCP) is the only constituent of concern (COC); however, groundwater monitoring is necessary to ensure the remedy remains protective for additional chemicals being found in the groundwater (e.g. chromium, naphthalene, and other volatile organic compounds).

PCP concentrations appear to be increasing and the plume migrating in a southerly direction, potentially off-site. Monitoring well results show that PCP continues to be detected above maximum Contaminant Levels at various wells. The highest PCP concentrations are now directly along the site's southern fence line. Recent developments indicate that free product (at the location MW-8A) may be more prevalent than previously characterized by earlier investigations.

**Regarding Institutional Controls:** The Institutional Controls (e.g. deed notice) required by the Record of Decision (ROD) have not yet been filed with Montgomery County.

**Recommendations and Follow-up Actions:** Recommended follow-up actions include continuing and upgrading site operations, maintenance and monitoring. Write an O&M Plan for the Resource Conservation and Recovery Act (RCRA) vault. A comprehensive groundwater monitoring program needs to be implemented, based on updated comprehensive analytical data; perform at least four consecutive quarterly events for a broad suite of parameters on all wells on-site and reanalyze potential COCs for such a plan. Analyze results of in situ chemical oxidation pilot tests; determine if the PCP (and/or other COC) plume is migrating off-site. Furthermore, the required deed restrictions should be filed with the County of Montgomery at the earliest opportunity followed by notification to the regulators.

**Protectiveness Statement(s):** The remedy for the on-site soils and off-site sediments at the Conroe site is protective of human health and the environment because the waste has been removed or contained. The remedy for groundwater is protective of human health and the environment in the short term because there is no evidence that there is current exposure and the remedy is being implemented as planned to reduce the volume of contamination and to control migration. However, in order to remain protective for the long term, the recommendations listed in section 8.0 should be implemented. Ongoing implementation of performance and compliance monitoring will allow verification that the migration of contamination continues to be controlled. Because the completed remedial actions and monitoring program for the Conroe site are protective in the short term, the remedy for the site is protective of human health and the environment and will continue to be protective if the action items identified in this report are addressed.

## 1.0 Introduction

The purpose of this Five-Year Review is to determine whether the remedy at the site is protective of human health and the environment, identify any problems or concerns that are affecting or may in the future affect the protectiveness of the remedy, and to make recommendations to address problems or concerns. This is the First Five-Year Review for the Conroe Creosoting Company Superfund Site (Conroe site), located in Conroe, Montgomery County, Texas, and was conducted during the period of April 2008 through September 2008 by the U.S. Army Corps of Engineers (USACE), Tulsa District, on behalf of the U.S. Environmental Protection Agency (EPA) Region 6.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) call for Five-Year Reviews of certain remedial actions. The statutory requirement to conduct a Five-Year Review was added to CERCLA as part of the Superfund Amendments and reauthorization Act (SARA) of 1986. The EPA classifies each Five-Year Review as either statutory or policy depending on whether it is being required by statute or is being conducted as a matter of policy.

The Record of Decision (ROD) for the Conroe site categorized the review as policy: However, based on a review of the NCP and EPA guidance on performing Five Year Reviews, it is more appropriate to classify this review as a “Statutory Five-Year Review.” CERCLA §121(c), as amended by SARA, 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.

NCP, Section 300.430(f)(4)(ii) 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 action no less often than every five years after the initiation of the selected remedial action.

The EPA five-year review guidance further states that a five-year review should be conducted as a matter of policy for the following types of actions:

- A pre-Superfund Amendments and Reauthorization Act (SARA) RA that leaves hazardous substances, pollutants, or contaminants onsite above levels that allow for unlimited use and unrestricted exposure
- A pre- or post-SARA RA that, once completed, will not leave hazardous substances, pollutants, or contaminants onsite above levels that allow for unlimited use and unrestricted exposure but will require more than five years to complete
- A removal-only site on the National Priorities List (NPL) where the removal action leaves hazardous substances, pollutants, or contaminants onsite above levels that allow for unlimited use and unrestricted exposure and no RA has or will be conducted.

The Five-Year Review is required as statute, not policy, based on the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use or unrestricted exposure.

## **2.0 Site Chronology**

A chronology of events and dates is included in **Table 1**, provided at the end of the report.

## **3.0 Background**

This section describes the physical setting of the site, a description of the land and resource use, and the environmental setting. This section also describes the history of contamination associated with the site, the initial response actions taken, and the basis for each action.

### **3.1 Physical Characteristics**

The Conroe site is an abandoned wood treating facility located at 1776 E. Davis Street, Conroe, Montgomery County, Texas (**Figure 1**). The geographic center of the site is Latitude 30.319° North and Longitude 95.435° West. A Site Area Plan is provided as **Figure 2**. The facility is located within the City of Conroe and is referenced on the Conroe Quadrangle, USGS 7.5-minute quadrangle.

The wood treating facility occupies approximately 147 acres. The site is bordered to the east by residential property, to the south by State Highway 105, and to the north and west by forested land. The preserving processes used PCP, creosote, and copper chromated arsenate (CCA) at the facility.

Prior to remediation, the Conroe site consisted of two process areas, one tank battery area, two kilns, a re-work area, a vehicle maintenance shop at the Plane Fast Trucking Company, boiler, lumber shed, a pole machine plant, two fuel pumps, an office, a sales office, a retail office along with several storage sheds and storage areas, and a pit. The perimeter of the site is defined by a fenced boundary. An on-site groundwater well (State Well No. 60-45-555) is located near the center of the site. The well's reported completion depth is 165 feet below ground surface (bgs).

The facility was closed down by the Montgomery County Tax Assessor/Collector in March 1997, due to delinquent taxes. The site's assets were sold by the county at an auction. Based on analytical sample results from Site Assessments, approximately 65,000 cubic yards of soil; 540,00 gallons of liquid, sludge, and contaminated water; several thousand feet of stream sediment; and approximately 11,000 pounds of copper and ammonia sulfate in a granular form were targeted for remediation at the site. All identified wastes were isolated and remediated. A RCRA vault, approximately eight acres in size, was constructed on-site to hold the wastes. Twenty-four groundwater monitoring wells were installed to investigate and monitor site groundwater. The majority of the surface of the site is now covered with planted grasses. Security for the RCRA vault is provided by a chain link fence. The entire Conroe site itself is surrounded by fencing, mostly 4-strand barbed wire, but there is no site security, and site access is not controlled via locked gates. The land, waste management units, and process units remain properties of Conroe Creosoting Company.

The surface topography of northern and western portions of Montgomery County are undulating; the southern and southeastern parts are level to gently sloping. The elevations range from 79 feet above mean sea level (msl) in the southern part to 330 feet above msl in the northwestern part of Montgomery County. General site elevations range from approximately 175 to 200 feet above

msl, the highest of which being generally the center of the site. Runoff from the site flows via ditches in both easterly and westerly directions.

The Conroe site is located in the San Jacinto River Basin. The general site drainage is overland sheet flow into an on-site drainage canal that flows east and west. The site is bordered by Little Caney Creek on the east side of the site and Stewart's Creek on the west side of the site. Runoff from the site flows via ditches in both easterly and westerly directions. On the east side of the site, the drainage ditches flow to the site's pond (also known as "The Lake"), which feeds Little Caney Creek. Little Caney Creek flows approximately 7.5 creek miles to its confluence with the West Fork of the San Jacinto River. Stewart's Creek, on the west side of the site, flows approximately 6.1 creek miles to its confluence with the West Fork of the San Jacinto River. Both Little Caney Creek and Stewart's Creek are considered perennial. The San Jacinto River ultimately empties into the Gulf of Mexico.

Montgomery County and the Conroe site are located in the Gulf Coastal Plain of Southeast Texas. The hydro-stratigraphic units, which comprise the aquifers of Montgomery County, range in age from Eocene to Holocene. These hydro-stratigraphic units, from oldest to youngest, are identified as the Jackson Group of Eocene age; the Catahoula Sandstone, Jasper aquifer, and Burkeville aquiclude of Miocene age; and the Evangeline Aquifer of Lower Pleistocene Age. Collectively, these units are estimated to attain a thickness of approximately 6,000 feet, and consist primarily of interbedded sand and clay with lesser amounts of limestone, lignite, gravel, gypsum, and volcanic ash. Regionally, these stratigraphic units dip toward the Gulf of Mexico at an angle greater than the land surface, and they tend to thicken and occur progressively deeper basinward. Near the site the Evangeline Aquifer ranges from surface to approximately 500 to 550 ft bgs.

The geology and hydrogeology of the Conroe site is relatively uniform throughout the site. A confining clay/silty clay layer is present from the ground surface to approximately 60 feet bgs. Small, thin discontinuous layers of clayey silt are present at certain boring locations, and were observed to exhibit strong chemical odors and oily staining in two locations. While there were strong odors from the more silty zones within these two boring locations, they are not a water-

bearing zone, nor does it appear that they are continuous across the site. Because of the discontinuous nature of the silty zones, substantial lateral migration was deemed unlikely.

Underneath this initial clay lies the first water bearing unit or SAND-1, which typically consists of a 40-foot thick unit of silty sand to sand. The sand unit is saturated throughout, and contains a fine to medium-grained sand, becoming coarse grained with depth. The unit includes a zone of gravelly sand near the bottom of the SAND-1 unit, with gravel ranging in sizes of 15 millimeters and smaller. Underneath SAND-1 is the silty clay aquitard separating the SAND-1 and deeper SAND-2 unit. The aquitard ranges in thickness from 10 to 20 feet, and varies in clay content across the site. The second sand or SAND-2 lies below the silty clay aquitard at a fairly constant depth of 130 feet bgs.

The potentiometric gradient in SAND-1 appears to be to the south southwest (**Figure 3**). The potentiometric surface for SAND-2 can only be inferred as the same direction based on the limited number of wells installed in that aquifer. No significant difference in groundwater elevations from the SAND-1 and SAND-2 zones is apparent from the groundwater elevation data. The shallow groundwater at the site appears to be a high-yielding water bearing unit, as substantial quantities of water were removed during well development while never dewatering the wells. The on-site water well was installed in 1982, and was used for site operations. This well is screened in the SAND-2 unit at a depth of 165 ft bgs. Residential water wells have been discovered in adjacent neighborhoods, and are believed to be screened in the SAND-2 water-bearing zone.

### **3.2 Land and Resource Use**

Land use in the area is divided principally between industrial and residential, leaning more towards industrial. There is a small residential area bordering the eastern portion of the site that consists of approximately 50 small residences. An industrial park borders the southern portion of the site and several businesses are located directly west of the site. Railroads, highways, and pipelines, cross the area.



The ROD considered the reasonable future use of the Conroe site as industrial or commercial use. Based on activities conducted for this First Five-Year Review, industrial or commercial use is still the probable future use of the site.

The Time-Critical Removal Action completed for the surface soils and sediments provided for a potential redevelopment opportunity at the Conroe site. The soils cleanup levels are suitable for commercial/industrial redevelopment of the property consistent with the future site use restrictions, excluding the area containing the RCRA vault. In addition, the removal action also produced an ecological benefit through remediation of the Stewarts Creek sediments and the prevention of further migration of creosote constituents into the stream segment.

The City of Conroe has plans to widen Stewart's Creek from State Highway 105 downstream to Spur 336 in southern Conroe to reduce flooding in residential areas. The creek will be widened to approximately 60 feet at the base and the slopes will be protected with cement and a cement-stabilized sand cover.

### **3.3 History of Contamination**

The Conroe site is an abandoned wood treating facility occupying approximately 147 acres that operated from 1946 until March 1997. The facility treated lumber, railroad cross-ties, poles and fence posts via three wood preserving processes that used PCP, creosote, and CCA at the facility. The wood preserving processes used pressure to force a solution of PCP dissolved in diesel, or creosote dissolved in diesel, or a solution of CCA, into the pore spaces of the wood. The treated wood was then allowed to dry on a drip pad.

Several compliance investigations were conducted by the Texas Commission on Environmental Quality (TCEQ) or its predecessor agency, both of which referred to as TCEQ here within, at the Conroe site during the 1980s and 1990s. Regulatory violations documented at the site resulted in the issuance of Agreed Orders in 1994 and 1999 to the Conroe Creosoting Company. On September 20, 1996, JHA Environmental Services, Inc., reported to the Conroe Creosoting Company the sample results which indicated elevated levels of creosote compounds, arsenic, and chromium in the soil and shallow groundwater. On June 1, 2001, an inventory of all tanks and

cylinders and the types of material that they either contain or used to contain was prepared by a consultant to the Conroe Creosoting Company. On March 22, 2001, the TCEQ inspectors observed leaking containers at the site. During the Expanded Site Inspection (ESI) conducted by the TCEQ the week of November 26, 2001, releases were sampled and hazardous substances were detected in the soils and sediments. Surface impoundments containing waste were draining off-site via drainage canals at the Conroe site. A drainage ditch running east to west, north of the process areas and south of the former maintenance shop, contained contaminated sediment. Runoff from the site flowed overland to the east to Little Caney Creek and to the west to Stewarts Creek. Secondary containment areas which held contaminated water were observed to be compromised in several areas, and the contaminated water was spilling out. Soil throughout the PCP and creosote process areas was heavily contaminated with semivolatile organic compounds (SVOCs), pesticides, and inorganics. A waste inventory conducted on June 1, 2001, listed several cylinders and tanks containing CCA solution, creosote sludge, PCP solutions and solids, and tank bottoms. The total quantity of hazardous waste in the tanks and containers, other than drums, was estimated to be over 100,000 gallons. Approximately sixty-two (62) drums were stored in an on-site shed. During the November 2001 ESI sampling event, an alleged waste burial area was determined by TCEQ to be a hazardous waste dumping area.

### **3.4 Initial Response**

The facility was closed down by the Montgomery County Tax Assessor/Collector in March 1997, due to delinquent taxes. The site's assets were sold by the county at an auction. The land, waste management units, and process units remained properties of Conroe Creosoting Company. Several compliance investigations and regulatory violations documented at the site resulted in the issuance of Agreed Orders in 1994 and 1999 to the Conroe Creosoting Company.

JHA Environmental Services, Inc. performed various investigations and an Environmental Site Assessment (ESA) from September 1996 through June 2001 (see **Figure 4**). The purpose of the ESA was to determine if contamination existed in discrete areas of the facility with regard to surface soils, subsurface soils, and shallow groundwater. The investigations and ESA indicated elevated levels of creosote compounds, arsenic, and chromium in soil and shallow groundwater and heavily contaminated soil was documented in the CCA, PCP, and creosote processing areas.

An inventory of the on-site tanks and cylinders and of the type of material that they contain or previously contained was conducted.

EPA issued a General Notice letter to the Conroe Creosoting Company on July 2, 2002, for the removal action at the site. The Company was unable to conduct the removal action based on a claim of inability-to-pay. A waiver of Special Notice letter for the Remedial Investigation (RI)/Feasibility Study (FS) and Remedial Design (RD)/Remedial Action (RA) was issued to the Company on July 2, 2003. Information requests were sent to the company to obtain financial and operational information. A Superfund lien was filed on the site property on November 12, 2002, pursuant to Section 107(1)(1) of CERCLA, 42 U.S.C. § 9607(1)(1).

During December 2002, the TCEQ conducted an ESI at the Conroe Creosoting site. The ESI included collecting and analyzing water samples from private and municipal water wells (see **Figure 6**). The analytical results from the water samples indicated no presence of creosote compounds. The TCEQ ESI report stated that they observed the release of creosote from the site into Stewart's Creek during their sampling activities. Releases were sampled and hazardous substances were detected in soils and sediments and an alleged waste burial area was determined by TCEQ to be a hazardous waste dumping area.

A Removal Assessment was conducted by the Superfund Technical Assessment and Response Team (START-2) personnel in 2002 and confirmed that 77 aboveground storage tanks (ASTs) and other vessels (four surface water impoundments, 75 drums, and a laboratory with 244 various-sized containers and jars) were present on-site. A total of 34 soil/sediment samples, six surface water samples, five dioxin/furan soil samples, and 44 waste liquid samples were collected during the Removal Assessment. Based on the analytical data received, approximately 65,000 cubic yards of soil exceeded the EPA Region 6 Screening Guidance for arsenic, chromium, PCP, total creosote, or dioxin/furan compounds. An estimated total of 540,000 gallons of liquid, sludge, and contaminated water and approximately 11,000 pounds of copper and ammonia sulfate in a granular form were identified on-site.

Based on the results of ESA, ESI and the START-2 Removal Assessment, the EPA also conducted an Off-Site Assessment of Stewart's Creek and Little Caney Creek to determine the extent of the off-site migration of the creosote related compounds and dioxin/furan from the site. A total of 425 sediment samples were collected during the assessment.

The EPA Emergency Response/Prevention Branch began an Emergency Response Removal Action on September 3, 2002, to prevent any further migration of chemicals from the site. The Time-Critical Removal Action focused on the on-site structures and soils; both on- and off-site sediments were targeted. Several additional source areas were discovered during the removal action. The two process units along with the raw product contained within the tanks were primary sources. The Creosote/PCP Process Unit was demolished along with some of the on-site buildings as necessary to remove any contamination from within or under the buildings. The liquids and materials located within the tanks were solidified with fly ash and on-site soil. Seventeen buried pits of various size and depths were found across the site (**Figure 5**). Based on the results from the site assessment, the removal action was expanded to include a removal action off-site in the drainage ditch and within Stewarts Creek. The EPA conducted a removal action within Stewarts Creek for approximately 2,400 linear feet downstream of the confluence of Division 3's drainage ditch and Stewarts Creek. The sediment and soil removed from Stewarts Creek was transported back to the site and stockpiled on the waste stockpile for final disposal. All the contaminated material, soils, sediments, and solidified wastes were placed inside an on-site RCRA vault. A total of 252,000 cubic yards of contaminated material was eventually placed inside the vault.

### **3.5 Summary of Basis for Taking Action**

The purpose of the response actions conducted at the Conroe site was to protect public health and welfare and the environment from releases or threatened releases of hazardous substances from the site. Exposure to affected soil, groundwater, surface water and sediment was determined to be associated with human health risks higher than the acceptable range. The primary threats that the Conroe site posed to public health and safety was the transport of on-site waste material and/or potential hazardous constituents and/or air emissions to nearby populated areas by surface

runoff, severe flooding, dike rupture, or disruption of the waste pits. This threat was minimized with the Time-Critical Removal Action and completion of the RCRA vault. The secondary threat that the Conroe site posed to public health and safety was direct contamination of groundwater supplies in the area.

## **4.0 Remedial Actions**

This section provides a description of the Remedial Action Objectives (RAOs), remedy selection, and implementation. It also addresses O&M, and the overall progress made at the Conroe site. At this site, the EPA Time-Critical Removal Action started in September 2002 has addressed the principal threat posed by wastes comprised of contaminated soil, sludge, and waste at the former process areas. The contaminated materials that exceeded health based levels at the site, drainage areas, and Stewarts Creek were excavated and placed in an on-site RCRA vault. Placement of the contaminated materials in the on-site RCRA vault prevents surface exposure to wastes and the migration of contaminants to the site groundwater zones. During April and June 2003, the EPA contracted Weston Solutions, Inc. to perform a two-phased groundwater RI. Because the contaminated soils and sediments were addressed through EPA's removal actions, only investigations and remedial alternatives for the groundwater were considered during the RI through the ROD process. The ROD set forth the selected remedy for site groundwater, which includes natural attenuation of the hazardous substances in the groundwater.

### **4.1 Remedy Objectives**

RAOs were developed for the Conroe site for those chemical and contaminant sources that pose a carcinogenic risk above EPA's target cancer risk range or non-carcinogenic hazard to human health and the environment based on site-specific risk calculations. RAOs were also defined to meet Applicable or Relevant and Appropriate Requirements (ARARs). The RAOs refer to specific sources, contaminants, pathways, and receptors. As outlined in the ROD, the EPA removal action has addressed the soil and sediment contamination at this site and has addressed the following RAOs:

- Prevent direct contact, ingestion, and inhalation of surface and subsurface soils that

exceed human health based levels for the constituents of concern (COCs).

- Prevent direct contact, ingestion, and inhalation of sediments in the drainage areas and creek that exceed human and ecological based levels for the COCs.
- Prevent the release of contaminants to surface and subsurface soils, surface water, and groundwater.
- Protect off site ecological receptors by preventing off site contaminant migration as a result of on-site releases.

Contamination in the Sand-1 aquifer, which has the potential to affect the local water supply for private residences as well as the City of Conroe, exceeds the MCLs established under the Safe Drinking Water Act. Data collected from sampling of monitoring wells located in the Sand-2 aquifer, which is a part of the local drinking water supply for nearby private residences as well as the City of Conroe, has not indicated contamination exists in this aquifer according to the limited data. Thus, protecting the Sand-2 aquifer from contamination as well as returning the contaminated portion of the Sand-1 aquifer to its beneficial use forms the basis for the following site-wide RAOs as developed in FS Report.

- Minimize further migration of the contaminant plume in the Sand-1 aquifer and prevent migration of contaminants to the Sand-2 aquifer.
- Restoration of the groundwater throughout the contaminant plume to its expected beneficial uses wherever practicable.

## **4.2 Remedy Selection**

The ROD for the Conroe site was signed on September 29, 2003. Remedial action objectives (RAOs) were developed for the Conroe Site for those chemical and contaminant sources that pose a carcinogenic risk above EPA's target cancer risk range or non-carcinogenic hazard to human health and the environment based on site-specific risk calculations. RAOs are also defined such that Applicable or Relevant and Appropriate Requirements (ARARs) are met. The RAOs refer to specific sources, contaminants, pathways, and receptors. The EPA's removal

action has addressed the soil and sediment contamination at this Site and has addressed the following RAOs:

- Prevent direct contact, ingestion, and inhalation of surface and subsurface soils that exceed human health based levels for the chemicals of concern.
- Prevent direct contact, ingestion, and inhalation of sediments in the drainage areas and creek that exceed human and ecological based levels for the chemicals of concern.
- Prevent the release of contaminants to surface and subsurface soils, surface water, and ground water. Protect off site ecological receptors by preventing off site contaminant migration as a result of on-site releases.

The existing contamination in the Sand-1 aquifer, which has the potential to form part of the local water supply for private residences as well as the City of Conroe, exceeds the MCL for PCP established under the Safe Drinking Water Act. The Sand-2 aquifer, which is a part of the local drinking water supply for nearby private residences as well as the City of Conroe, has not been contaminated. Thus, protecting the Sand-2 aquifer from contamination as well as returning the contaminated portion of the Sand-1 aquifer to its beneficial use forms the basis for the following site-wide RAOs.

- Minimize further migration of the contaminant plume in the Sand-1 aquifer and prevent migration of contaminants to the Sand-2 aquifer.
- Restoration of the ground water throughout the contaminant plume to its expected beneficial uses wherever practicable. This objective will require a much longer time frame to achieve with an optimum period of 10 years but may take up to 20 years.

The ROD set forth the selected remedy for the Site, which includes natural attenuation of the hazardous substances in the ground water, no further action for the on-site soils and offsite sediments, and long-term maintenance of the RCRA vault. The selected remedy is a comprehensive approach for this Site that addresses all current and potential future risks caused by ground water contamination and implements institutional controls to ensure future site use is consistent with the acceptable risk levels in the on-site soils. The major components of this remedy are:

- A ground water monitoring program to track the effectiveness of natural attenuation processes in reducing contaminant concentrations in the Sand-1 aquifer as well as ensure that there is no exposure to contaminants above the drinking water limits;
- Placement of appropriate institutional controls to ensure that any future land owners will be notified that the land was a former Superfund site and hazardous substances remaining on-site in the ground water are above health-based concentration levels; prevent future installations of water supply wells at the Site; and restrict future redevelopment of the property to non-residential use based on contaminant concentrations remaining in the surface soils. EPA will attempt to negotiate an Administrative Order on Consent or other mechanism implementing a property easement and/or other appropriate controls with the landowner of the Site; and
- Long-term maintenance of the RCRA vault containing the contaminated soils and sediments excavated from the Site and adjacent Stewart's Creek.

### **4.3 Remedy Implementation**

The EPA initiated a Time-Critical Removal Action on September 3, 2002 which focused on the on-site structures and soils; both on- and off-site sediments were also targeted. The two process units along with the raw product contained within the tanks were primary sources, although several additional source areas were discovered during the removal action. The EPA and removal contractor divided the site into ten divisions based on geographic location and previous investigations (see **Figure 4**). Two divisions included the two process units due to the amount of product in the tanks and the type of work needed to handle and remove the product. The other eight divisions were established based on geographic locations and natural site boundaries. The Creosote/PCP Process Unit was demolished along with some of the on-site buildings as necessary to remove any contamination from within or under the buildings. The liquids and materials located within the tanks were solidified with fly ash and on-site soil. During the removal action, 17 buried pits of various size and depths were identified throughout the site. Excavated and demolished material was segregated and stockpiled into separate soil/waste/debris/concrete piles in several areas of the site. The soil/waste/debris piles were eventually placed in the RCRA vault. A total of 252,000 cubic yards of contaminated material was eventually placed inside the vault. The concrete was utilized on-site for riprap or was placed



on top of existing concrete slabs. Scrap metal was stockpiled on-site and eventually transported off-site for recycling to J&L Recycling of Conroe, Texas.

A groundwater monitoring well network was installed from May 2 to 29, 2003, and consisted of 21 wells in the Sand-1 aquifer and three wells in the Sand-2 aquifer (**Figure 6**). Of the 21 Sand-1 monitoring wells, the eleven labeled as MW-1A through MW-11A were screened in the upper 15 feet of the sand to capture potential LNAPL. Ten Sand-1 monitoring wells, labeled MW-1B through MW-10B, were screened in the lower ten feet of the sand to capture potential dense non-aqueous phase liquids. The individual monitoring wells were constructed of 4-inch PVC casing. The deep Sand-2 wells (MW-12, MW-13, and MW-14) were completed with 10-foot sections of screen below the base of the silty clay. The EPA and TCEQ conducted the Final Construction Inspection on September 22, 2003, and determined that the contractor had completed the Time-Critical Removal Action and installation of the groundwater wells for the MNA remedy for the Conroe site, and no further remedial construction activities were anticipated.

Following a review of water quality data generated from groundwater sampling events conducted at the site from May 2003 to February 2006, EPA decided to evaluate methods for the rapid destruction of PCP through the focused addition of an oxidant in the immediate vicinity of impacted wells (well clusters 8 and 10). An initial pilot test was conducted during September 2006 using existing on-site monitoring wells as injection points. The initial application of RegenOx™ in existing wells was not successful in lowering the PCP concentrations below the MCLs at the impacted wells. At the same time, it appears that the wells used in the initial pilot test may have been impacted (plugged) during the initial RegenOx™ application. In addition, the activities documented during the September 2006 ISCO pilot test and 2006 groundwater sampling events indicate that free product at the location (MW-8A) may be more prevalent than previously hypothesized during earlier investigations. Therefore, additional characterization may be necessary to determine if NAPL source areas are still present.

A Supplemental Pilot Test was conducted during June 2008 at the Conroe site to address localized PCP groundwater contamination. The following actions were conducted:

- Abandonment of existing monitoring wells rendered inoperable during the initial pilot test (MW-8A, MW-10A, and MW-10B)
- Installation of replacement monitoring wells
- Supplemental ISCO injection using direct-push technology
- Groundwater monitoring to validate the efficacy of the supplemental pilot study, and monitor groundwater quality beneath the entire site.

Groundwater sampling results were not available during preparation of this First Five-Year Review.

#### **4.4 Operations and Maintenance**

Because hazardous materials remain on-site, access to the Conroe site should be restricted. On-site soils and off-site sediments remaining on-site, aside from the RCRA vault, are below target industrial action levels as a result of the removal action; no O&M are required for site soils.

Regarding the RCRA vault, the vegetative cover and capped area of the vault should be maintained and the leachate collection system monitored; however, O&M of the RCRA vault has only occurred once since the ROD was signed, and activities were limited. MNA was selected as the appropriate action for affected groundwater, and as a result, a long-term groundwater monitoring program needs to be prepared and implemented. However, a groundwater monitoring program has not been formally developed or implemented, though sporadic sampling has occurred since the ROD was signed.

The RCRA vault is appropriately fenced and posted. A written O&M plan has not been created at this point in time. With the exception of one maintenance event occurring in the fall of 2007, no O&M has occurred regarding the vault since its completion. During the fall of 2007 maintenance event, some grubbing and clearing of brush and small trees apparently occurred on the cap, and the leachate collection system was monitored and sampled. Records or data regarding this event indicate a substantial amount of leachate present in the RCRA vault that needs to be remediated.

A groundwater monitoring well network was installed during the RI in May 2003 and sampled three times during 2003. The ROD, which initiated the implementation of MNA, was submitted in September 2003. The first sampling event, after submission of the ROD, did not occur until November 2005, with only nine of the 24 wells being sampled. Fourteen of the 24 wells were sampled in February 2006. The last sampling round to occur was October 2006 when all 24 wells were sampled. Based on the last three sampling rounds, EPA is currently evaluating methods for the rapid destruction of PCP through an in-situ chemical oxidation (ISCO) pilot test in the immediate vicinity of the impacted wells. An initial pilot test was conducted during September 2006, and a second injection application was performed during June 2008. Groundwater Sampling reports for the last three events are available as well as a report for the initial ISCO pilot test.

The annual O&M costs for sampling the groundwater monitoring well network was estimated to be between \$23,000 and \$84,000, according to the ROD. An estimate for O&M costs for the RCRA vault was not provided for within the FS or ROD. Actual costs associated with the three groundwater monitoring events and the oxidant injection tests performed during the five-year review period are forthcoming from the EPA (to be provided shortly). O&M costs for the fall 2007 RCRA vault maintenance event were not available.

## **5.0 Five-Year Review Process**

This Five-Year Review has been conducted in accordance with the EPA's *Comprehensive Five-Year Review Guidance*, dated June 2001 (EPA, 2001). The Five-Year Review for this site was initiated by the EPA which tasked the USACE to perform the technical components of the multidisciplinary review. The ROD, signed on September 29, 2003, set forth the selected remedy for the site, which includes natural attenuation of the hazardous substances in the groundwater. Initiation of this First Five-Year Review was based on the ROD. Members of the review team include Mr. David Jones, Mr. Frank Roepke, and Ms. Susan Trussell, all of the Tulsa District USACE.

Interviews were conducted with relevant parties; a site inspection was conducted; and applicable data and documentation covering the period of the review were evaluated. The findings of the review are described in the following sections.

### **5.1 Community Involvement**

A public notice announcing initiation of the Five-Year Review was published in the Conroe Courier Daily News on May 18, 2008. Upon signature, the Five-Year Review will be placed in the information repositories for the site, including the Conroe site and the TCEQ office in Austin, Texas. A notice will be published in the Conroe Courier Daily News to summarize the findings of the review and announce the availability of the report at the information repositories. A copy of the first public notice is provided as **Attachment 7** to this report.

### **5.2 Document Review**

This Five-Year Review included a review of relevant site documents, including the ROD, RI Report, FS Report, construction and implementation reports, quarterly reports, and related monitoring data. Documents that were reviewed are listed in **Attachment 1**.

### **5.3 Data Review**

Prior to the Time-Critical Removal Action and construction of the RCRA vault, numerous site assessments were performed at the Conroe site in order to characterize the nature and extent of any COCs present. The removal action then focused on the on-site structures and soils; both on- and off-site sediments were targeted. During the removal action, 17 buried pits of various size and depths were identified throughout the site and remediated. A total of 252,000 cubic yards of contaminated material was eventually placed inside a RCRA vault. Post removal confirmation soil samples were collected upon the completion of the removal action. All site assessments and remedial activities and analytical data generated are documented in various reports and are available for review within the Administrative Record.

The site hydrogeology was investigated by conducting cone penetrometer testing, evaluating a site-wide surface resistivity survey, and the installation and sampling of the 24 wells installed during the RI. The site hydrogeology is relatively uniform, with a confining clay/silty clay layer present from the ground surface to approximately 60 feet bgs. Underneath this clay layer is a 40-

foot thick sand unit that is the uppermost water bearing sand of the Chicot Aquifer (Sand-1). A silty clay ranging in thickness from 10 to 20 feet separates the Sand-1 unit from the Sand-2 unit. The Sand-2 unit occurs at a fairly constant depth of 130 feet bgs.

A groundwater monitoring well network was installed during May 2003, and consists of 21 wells in the Sand-1 aquifer and three wells in the Sand-2 aquifer (**Figure 5**). Of the 21 Sand-1 monitoring wells, the eleven labeled as MW-1A through MW-11A are screened in the upper 15 feet of the sand to capture potential LNAPL. Ten Sand-1 monitoring wells, labeled MW-1B through MW-10B, are screened in the lower ten feet of the sand to capture potential dense non-aqueous phase liquids. The individual monitoring wells are constructed of 4-inch PVC casing. The deep Sand-2 wells (MW-12, MW-13, and MW-14) were completed with 10-foot sections of screen below the base of the silty clay. A private water supply well at the Conroe Creosoting facility was screened at a depth of 150 to 165 feet bgs, within the Sand-2 unit.

The 21 wells constructed within the Sand-1 aquifer were sampled May 7 through May 21, 2003 for SVOCs. All 24 wells were then sampled May 27 through May 30, 2003 for SVOCs, volatile organic compounds (VOCs), and RCRA metals. Four wells were resampled June 17 through June 20, 2003 for SVOCs and RCRA metals. The principal contaminants detected in groundwater include naphthalene and PCP, with maximum detected concentrations of 174 micrograms per liter ( $\mu\text{g/L}$ ) naphthalene and 94  $\mu\text{g/L}$  PCP. Chromium was also widely detected above the MCL, but according to the ROD, chromium was determined to be a product of the leachate originating from the grout used in the monitoring well construction. NAPL was not detected in the Sand-1 aquifer, and the low dissolved-phase concentrations do not indicate the presence of a separate NAPL in groundwater. The groundwater contamination is located under the former tank battery and the adjacent creosote and PCP process area, which was concluded to be the source of the groundwater contamination. **Figure 7** shows the PCP plume in 2003; monitoring well clusters 8 and 10 are located within the plume. Samples from the three monitoring wells and the existing on-site water supply well, all screened in the Sand-2 unit, did not detect contamination in the Sand-2 aquifer. **Table 2** indicates PCP concentrations from the three 2003 sampling events.

Based on these initial three sampling events, the EPA determined that while there is no current exposure to contaminated groundwater above acceptable risk levels, monitoring of the groundwater will be necessary to ensure site conditions do not change, resulting in exposure to contaminated groundwater that is above acceptable risk levels. EPA submitted the ROD, initiating MNA for the site. The Remedial Goals for COCs in groundwater are based on the MCLs established under the Federal Safe Drinking Water Act. The COC in groundwater for this site is PCP and the remedial action goal is 1 µg/L. One of the major components of the site remedy, as stated in the ROD is to establish a groundwater monitoring program to track the effectiveness of natural attenuation processes in reducing contaminant concentrations in the Sand-1 aquifer as well as ensure that there is no exposure to contaminants above the drinking water limits.

Once the ROD was submitted, sampling did not resume until November 2005. Three events have occurred since November 2005 (see **Table 3**). Over the course of the O&M program, the list of designated wells to be sampled has been modified. During November 2005, only 9 of the 24 wells were sampled. Fourteen of the 24 wells were sampled in February 2006. The last sampling round to occur was October 2006 when all 24 wells were sampled. Only SVOCs were tested for each of these three sampling events. The three wells installed in the deeper Sand-2 unit were only sampled once during these events.

While it is difficult to determine any trends from the limited data available, analytical results from these recent sampling events indicate that PCP concentrations may not be declining. In November 2005 PCP concentrations were 109 µg/L and 713 µg/L in monitoring wells MW-8A and MW-10B respectively. MW-10A had a concentration of 61.1 µg/L. These detected concentrations were significantly higher than those observed in 2003. However, PCP concentrations were down dramatically in the February 2006 event with only MW-8A having a detectable concentration of 13.3 µg/L. It may be noteworthy that in 2003, PCP concentrations were higher in well cluster 10 compared to 8. Presently, the highest PCP concentrations are located in well cluster 8 situated on the southern border of the Conroe site. **Figure 8** shows the PCP plume in 2006.

Based on the November 2005 and February 2006 sampling rounds, EPA conducted a pilot test for the rapid destruction of PCP through the focused addition of an oxidant in the immediate vicinity of impacted wells. This initial pilot test and injection of RegenOx™ in existing wells was conducted during September 2006, followed by a groundwater sampling event during October 2006. PCP was detected in four wells with the highest detection of 78.7 µg/L in MW-08A. The initial application of RegenOx™ did not appear successful in lowering the PCP concentrations below the MCLs at the impacted wells. Additionally, it appears that the wells used in the initial pilot test may have been impacted (plugged) during the initial RegenOx™ application. EPA has re-evaluated the injection process and a second injection application was performed during June 2008 utilizing direct push technology. Additional groundwater sampling will be performed to assess the success of the second application; however, analytical data from that sampling event will not be available for this five-year review period.

#### **5.4 Interviews**

A partial interview was conducted with the site O&M manager, Mr. Jeffrey Patterson during the site visit conducted on May 21, 2008. Mr. Patterson is also the TCEQ representative for this site. A follow-up interview was conducted via phone on June 30, 2008. An interview form was provided to the EPA Remediation Project Manager, Mr. Gary Baumgarten, who completed and returned the form on June 20, 2008. Mr. Jerry McGuire, the Conroe City Administrator was contacted and interviewed by phone on August 8, 2008. The completed interview record forms are presented in **Attachment 2**.

#### **5.5 Site Inspection**

An inspection was conducted at the site on May 21, 2008. The completed site inspection checklist is provided in **Attachment 3**. Site inspection tasks included a visual inspection of site features including the RCRA vault cap, monitoring wells, fences and gates. No site logs, documents, or records were available on-site. Photographs taken during the Conroe site inspection are provided in **Attachment 4**. The site inspection indicated that the chosen remedies appeared appropriate, but because site O&M was not being performed, the effectiveness of those remedies was at risk. Several concerns were noted, as stated on the inspection checklist and noted in Section 7.0 . The inspection team consisted of Mr. David Jones and Mr. Frank Roepke

of the USACE. They were accompanied by Mr. Gary Baumgarten of EPA Region 6 and Mr. Jeffrey Paterson, the TCEQ representative. Mr. Jeffrey Patterson is also the Conroe site O&M representative.

## **6.0 Technical Assessment**

The Five-Year Review must determine whether the remedy at a site is protective of human health and the environment. The EPA guidance describes three questions used to provide a framework for organizing and evaluating data and information, and to ensure all relevant issues are considered when determining the protectiveness of a remedy.

### **6.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?**

The document that details the remedial decisions for the site is the September 2003 ROD. The ROD set forth the selected remedy for the site, which includes natural attenuation of the hazardous substances in the groundwater, no further action for the on-site soils and off-site sediments, and long-term maintenance of the RCRA vault constructed to contain the excavated soils and sediments. The selected remedy is a comprehensive approach for this site that addresses all current and potential future risks caused by groundwater contamination and implements institutional controls to ensure future site use is consistent with the acceptable risk levels in the on-site soils. The major components of this remedy are:

- Long-term maintenance of the RCRA vault containing the contaminated soils and sediments excavated from the site and adjacent Stewart's Creek
- A groundwater monitoring program to track the effectiveness of natural attenuation processes in reducing contaminant concentrations in the Sand-1 aquifer as well as ensure that there is no exposure to contaminants above the drinking water limits. For this site, a contingency measure also includes the use of an oxygen (either air or a liquid additive) and/or nutrient delivery system to enhance the natural degradation of the PCP, should examination of the MNA process warrant it.
- Placement of appropriate institutional controls to ensure that any future land owners will be notified that the land was a former Superfund site and hazardous substances remaining



on-site in the groundwater are above health based concentration levels; prevent future installation of water supply wells at the site; and restrict future redevelopment of the property to non-residential use based on contaminant concentrations remaining in the surface soils. EPA will attempt to negotiate an Administrative Order on Consent or other mechanism implementing a property easement and/or other appropriate controls with the landowner of the site.

The text below further describes the function of each component of the selected remedy.

**RCRA Vault.** The EPA's removal action addressed the soil and sediment contamination at this site. Removal of the contaminant sources and placement in the RCRA vault has prevented direct contact, ingestion, and inhalation of sediments, surface and subsurface soils that exceed human health based levels for the chemicals of concern. It has also prevented release of contaminants to surface and subsurface soils, surface water, and groundwater and protected off-site ecological receptors by preventing off site contaminant migration as a result of on-site releases. The soil remedy is effective and functioning as designed; however long-term maintenance of the RCRA vault has been minimal since its construction, and the RCRA vault is in need of maintenance to ensure long-term protection of human health and the environment.

**Groundwater.** Shallow groundwater at the site is contaminated with PCP. The ROD set the remedial goal for the Sand-1 aquifer at 1 µg/L based on the MCL. While sporadic groundwater sampling events have taken place in the last five years, a groundwater monitoring program/plan has not been implemented at the site. PCP concentrations may have increased and the center of the PCP plume may have migrated to the southern boundary of the site. EPA has implemented two separate pilot tests using in-situ chemical oxidation to enhance the natural degradation of the PCP. Results of the second injection process have not been determined at the writing of the five year review. Because of the limited amount of groundwater analytical data, coupled with uncertainty of the recently implemented contingency, it is uncertain whether the remedy selection is functioning as designed. Because the contaminated groundwater is not currently used as a drinking source, and evidence does not indicate that contamination has migrated to the lower aquifer that is used as a drinking water, the groundwater remedy appears to be effective,

however, long-term groundwater monitoring needs to be implemented to ensure long-term protection of human health and the environment. In addition, the monitoring well network in the Sand-2 aquifer may not be sufficient to characterize the flow directions in the Sand-2 aquifer; therefore, uncertainty exists about the presence of contamination in this aquifer, which leads to uncertainty about protectiveness.

**Implementation of Institutional Controls.** The EPA has attempted to negotiate an Administrative Order on Consent or other mechanism implementing a property easement and/or other appropriate controls with the landowner of the site, but has been unsuccessful. No deed restrictions or notices have been filed to date in Montgomery County. Therefore, institutional controls have not been implemented and are not functioning as intended in the ROD to ensure long-term protection of human health and the environment.

## **6.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of the Remedy Selection Still Valid?**

The purpose of this question is to evaluate the effects of any significant changes in standards or assumptions used at the time of remedy selection. Changes in promulgated standards or “to be considered” and assumptions used in the original definition of the remedial action may indicate that an adjustment in the remedy is necessary to ensure the protectiveness of the remedy.

Changes in ARARs. ARARs for this site were identified in the ROD dated September 29, 2003.

The primary ARAR was:

- Federal Safe Drinking Water Act Maximum Contaminant Levels, Maximum Contaminant Level Goals, and Action Levels (40 CFR Part 141), which specify primary drinking water standards for public water supply systems.

For groundwater at the Conroe site, the remedial action goal is 1 µg/L for PCP, the only COC. The TCEQ and the Federal regulations have not been revised to the extent that the effectiveness of the remedy at the site would be called into question.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics. The toxicity value used by EPA for their Integrated Risk Information System has changed for one compound since the ROD was approved. The Reference Dose (RfD) for chronic oral exposure for barium was increased from  $7 \times 10^{-2}$  milligrams per kilograms per day (mg/kg-day) to 0.2 mg/kg-day on July 7, 2005. Barium was a Contaminant of Potential Concern (COPC) during the development of the risk assessment for the site. This RfD change decreased the toxicity value; therefore, the remedy from the ROD is still more protective than the effects of the RfD changes on risk for this compound.

There have been no other changes in exposure pathways, toxicity characteristics, or other contaminant characteristics for the Conroe site. There has also been no change to the standardized risk assessment methodology that would affect the protectiveness of the remedy.

### **6.3 Question C: Has Any Other Information Come to Light That Could Call into Question the Protectiveness of the Remedy?**

The ROD requires placement of institutional controls to prevent exposure to contaminated ground water above acceptable risk levels during the remedial action activities. Access to the Site and potential future uses would be limited through the use of a property easement or other restrictive mechanisms. No deed notices or restrictions have been implemented on the property, and this may impinge on the effectiveness of the remedy.

## **7.0 Issues**

Several issues are identified for this site, as described in the following table.

No.	Issues	Affects Protectiveness (Y/N)	
		Current	Future
1	<u>RCRA vault cap requires repair.</u> There is currently little to no vegetative cover on the cap. The side slopes contain numerous erosional channels up to two feet in depth. As a result of the side slope erosion, vault geotextiles are exposed in approximately 30 locations. There are also large gaps between the bottom of the vault fencing and ground surface.	N	Potential Impact

2	<u>An O&amp;M plan needs to be created and implemented for the vault.</u> There is no current plan to address the cap maintenance or leachate collection system. Leachate sampling occurred in the fall of 2007 and results indicated a significant amount of leachate present that needs to be addressed.	N	Potential Impact
3	<u>A comprehensive groundwater monitoring program needs to be implemented, based on updated comprehensive analytical data.</u> Only three groundwater sampling rounds have occurred in the last five years, with only SVOCs analyzed, and then only on a portion of the site's 24 wells. The deep wells in the Sand-2 unit, which EPA is trying to prevent from being contaminated, are not being sampled regularly (only once during the last three events).  Recent developments documented during the September ISCO pilot test and October 2006 groundwater sampling event indicate that free product at the location (MW-8A) may be more prevalent than previously hypothesized during earlier investigations.	N	Potential Impact
4	Monitoring well results show that PCP continues to be detected above MCLs at various wells. The highest PCP concentrations are now directly along the site's southern fence line.	N	Potential Impact
5	<u>Implement Institutional Controls.</u> Institutional controls in the form of deed notice or restrictions have not yet been filed as required by the ROD. It is noted that the current landowner is attempting to sell this property.	N	Potential Impact

## 8.0 Recommendations and Follow-Up Actions

Recommended further actions are listed in the table below.

No.	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
					Current	Future
1	<u>RCRA vault cap requires repair.</u> Repair erosional channels and reseed cap.	TCEQ	EPA	March 2009	N	Y

2	<u>An O&amp;M plan needs to be created and implemented for the RCRA vault.</u> Write O&M Plan; document the fall 2007 maintenance event into a report.	TCEQ	EPA	March 2009	N	Y
3	<u>A comprehensive groundwater monitoring program needs to be developed and implemented, based on updated comprehensive analytical data.</u> Perform at least four consecutive events for a broad suite of parameters (e.g. SVOCs, metals, pesticides, and MNA parameters) on all wells on-site, and check all site wells during sampling events for the presence of LNAPL..	EPA	EPA	March 2009	N	Y
4	<u>Analyze results of ISCO pilot tests;</u> determine if PCP (and/or other COC) plume is migrating	EPA	EPA	January 2009	N	Y
5	<u>Enact institutional controls.</u> The required deed restrictions or notice should be filed with the County of Montgomery at the earliest opportunity followed by notification to the regulators.	EPA	EPA	January 2009	N	Y

## 9.0 Protectiveness Statement

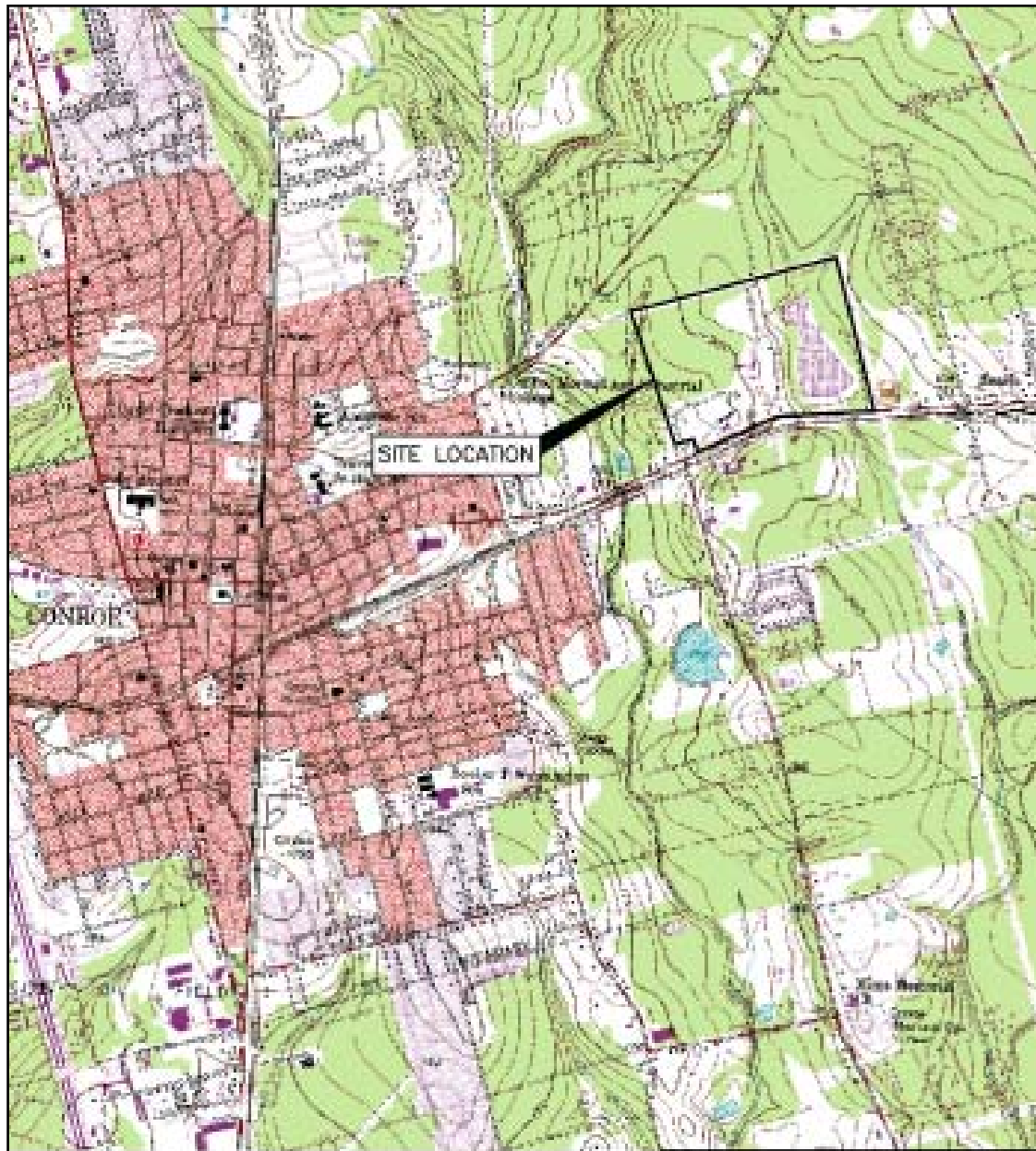
The remedy for on-site soils and off-site sediments at the Conroe site is protective of human health and the environment because the waste has been relocated and contained. The remedy for groundwater is protective of human health and the environment in the short term because there is no evidence that there is current exposure and the remedy is being implemented as planned to reduce the volume of contamination and to control migration. However, in order to remain protective for the long term, the recommendations listed in section 8.0 should be implemented. Ongoing implementation of performance and compliance monitoring will allow verification that the migration of contamination of site groundwater continues to be restricted. Because the

completed remedial actions and monitoring program for the Conroe site are protective in the short term, the remedy for the site is protective of human health and the environment and will continue to be protective if the action items identified in this report are addressed.

## **10.0 Next Review**

The next Five-Year Review, the second for this site, should be completed by September 30, 2013. The review should focus primarily on an update to the status of the natural attenuation of groundwater based on a sound, comprehensive Groundwater Monitoring Sampling Plan implemented during this next five-year review period. The review should also focus on the long-term maintenance of the RCRA vault, coupled with an O&M plan for the vault. Issues discussed in Section 7.0 should be reviewed and addressed where applicable.

# Figures and Tables



SOURCE: USGS 7.5 SERIES TOPOGRAPHIC,  
 CONROE, TEXAS 1978  
 DERIVED BY TOPOGRAF/RSI  
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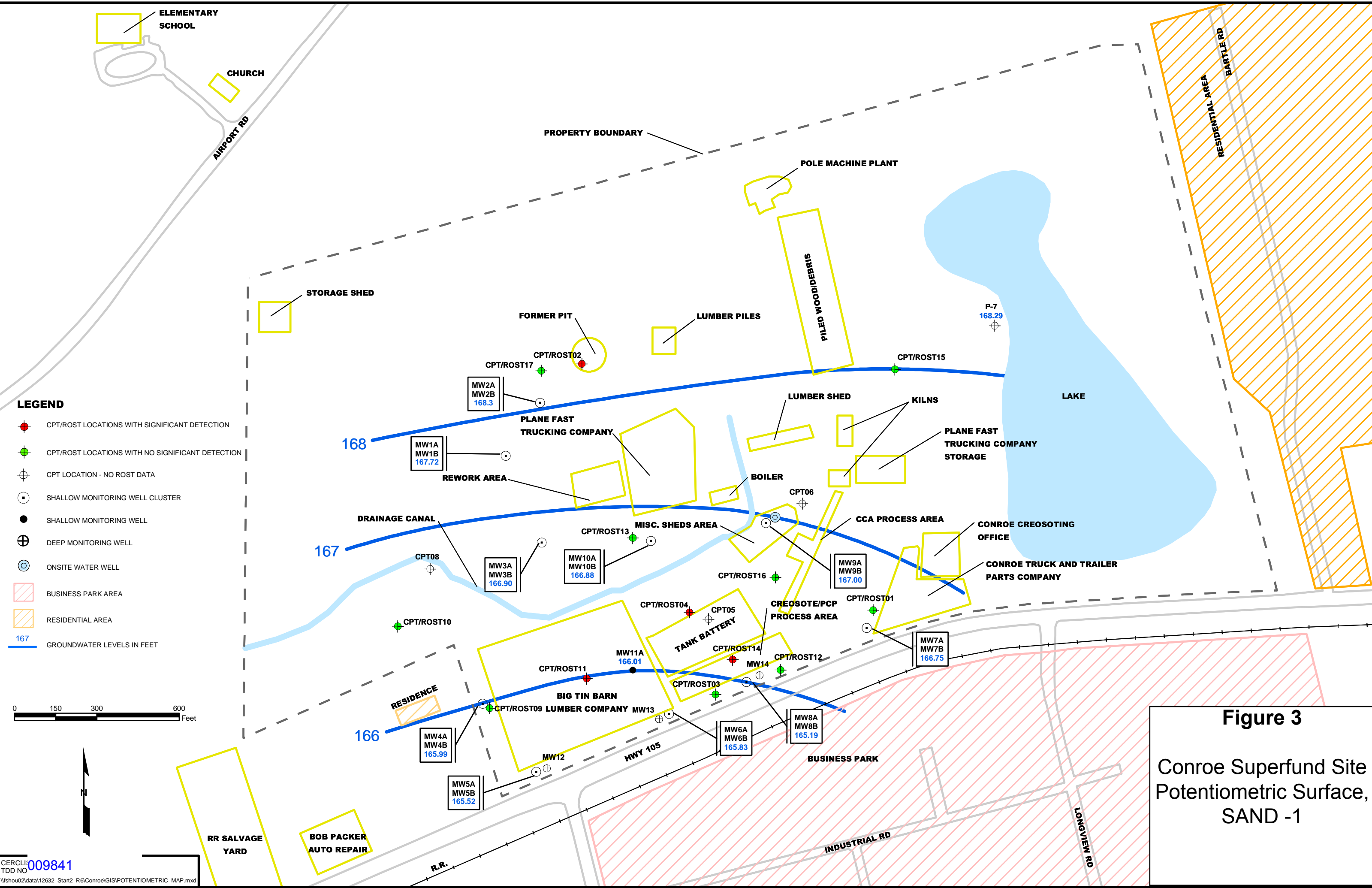
**Figure 1**

**Conroe Superfund Site  
 Location Map**

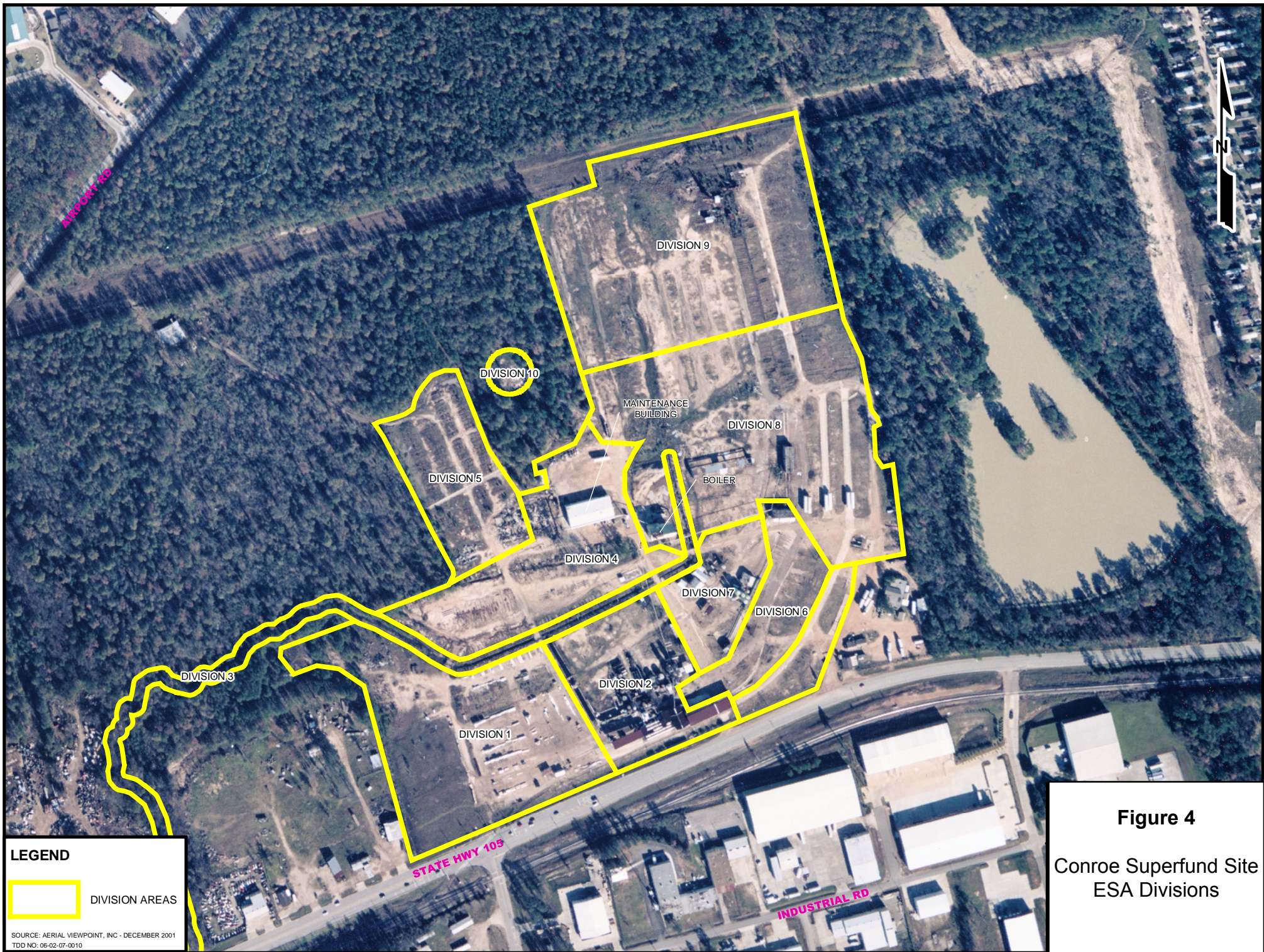


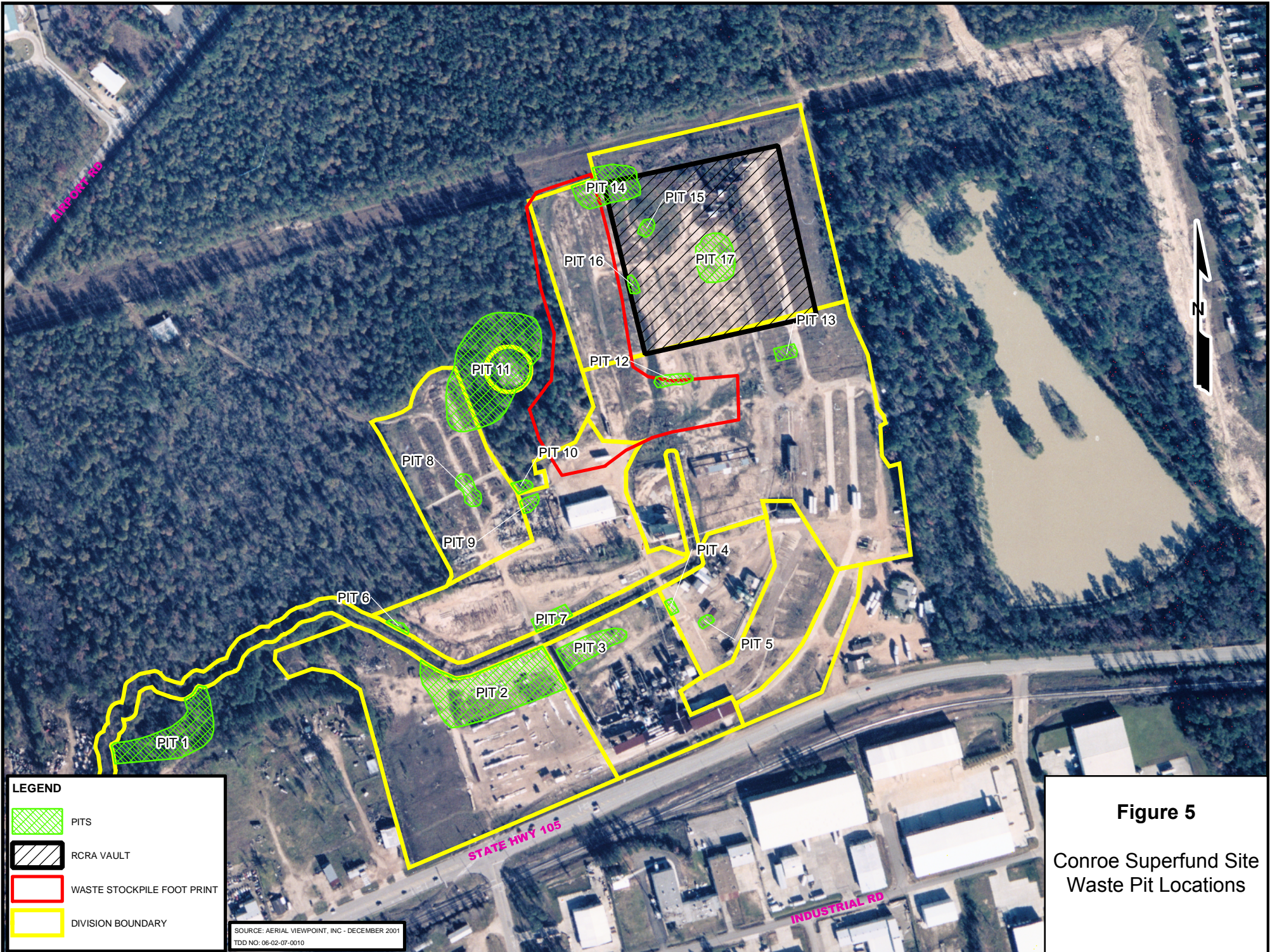
Figure 2 - Conroe Superfund Site Map

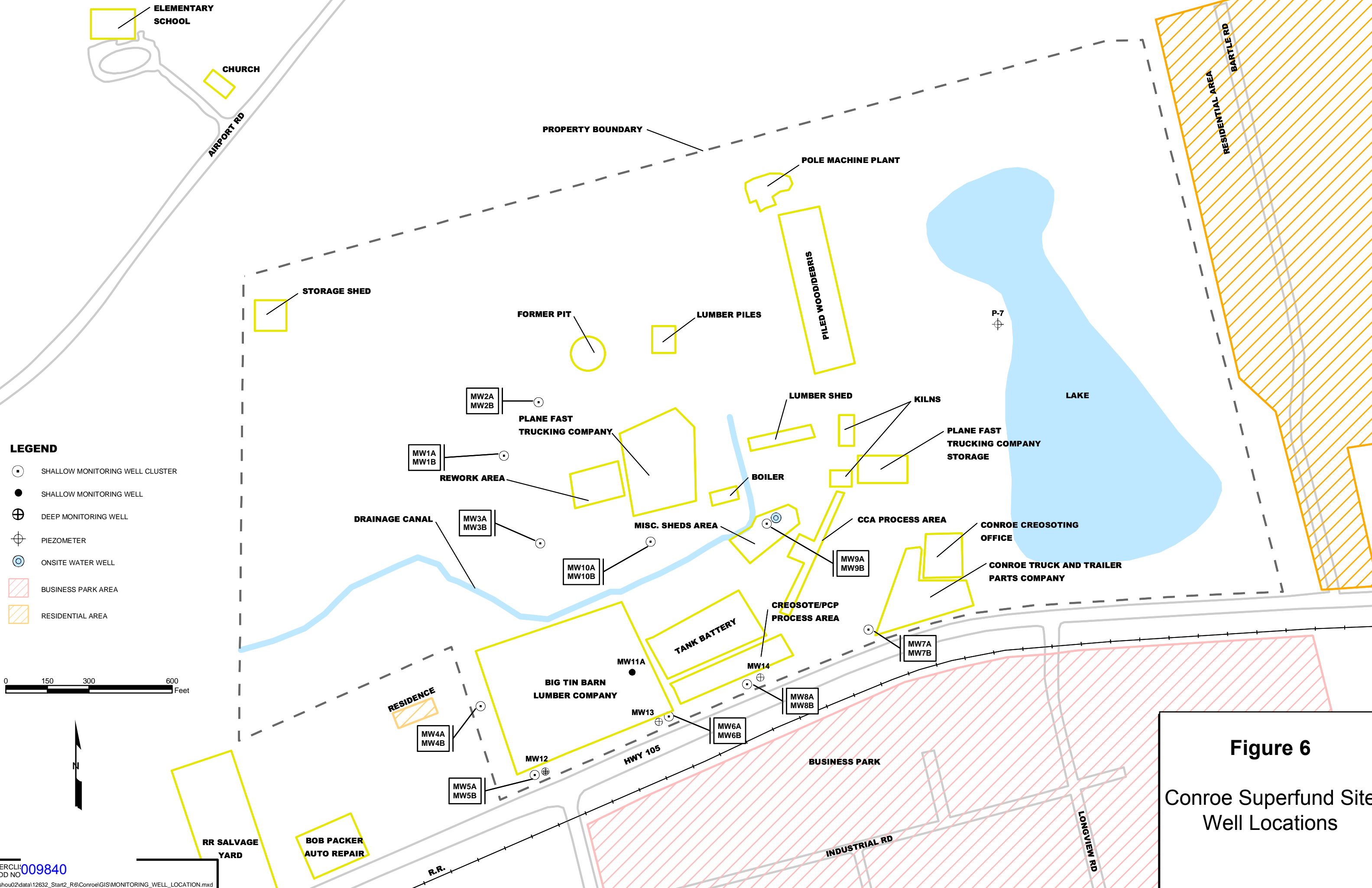




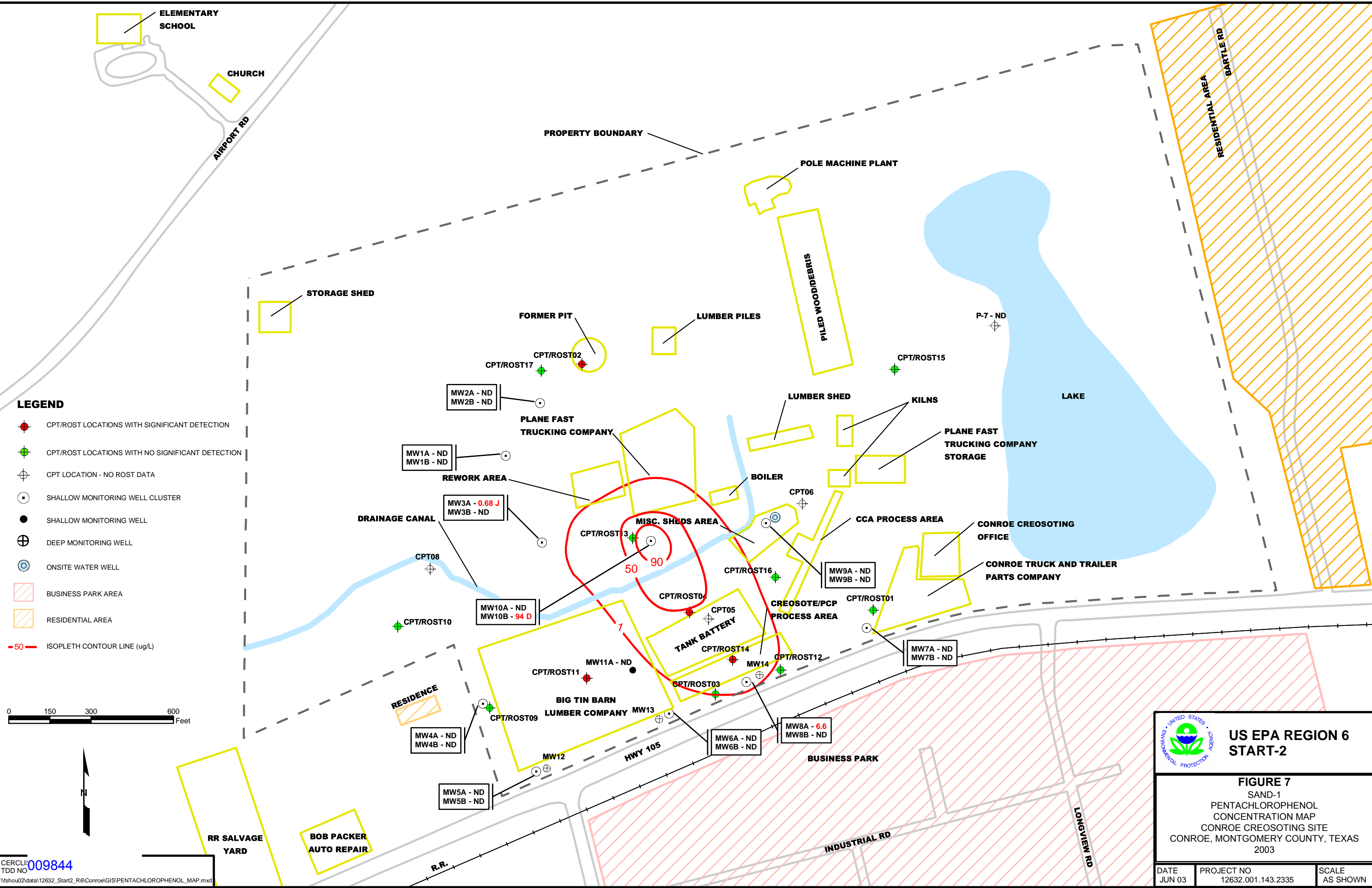
**Figure 3**  
 Conroe Superfund Site  
 Potentiometric Surface,  
 SAND -1





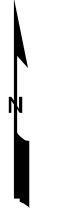


**Figure 6**  
 Conroe Superfund Site  
 Well Locations



- LEGEND**
- CPT/ROST LOCATIONS WITH SIGNIFICANT DETECTION
  - CPT/ROST LOCATIONS WITH NO SIGNIFICANT DETECTION
  - ⊕ CPT LOCATION - NO ROST DATA
  - ⊙ SHALLOW MONITORING WELL CLUSTER
  - SHALLOW MONITORING WELL
  - ⊕ DEEP MONITORING WELL
  - ⊙ ONSITE WATER WELL
  - ⊕ BUSINESS PARK AREA
  - ⊙ RESIDENTIAL AREA
  - 50 ISOPLETH CONTOUR LINE (ug/L)

0 150 300 600 Feet



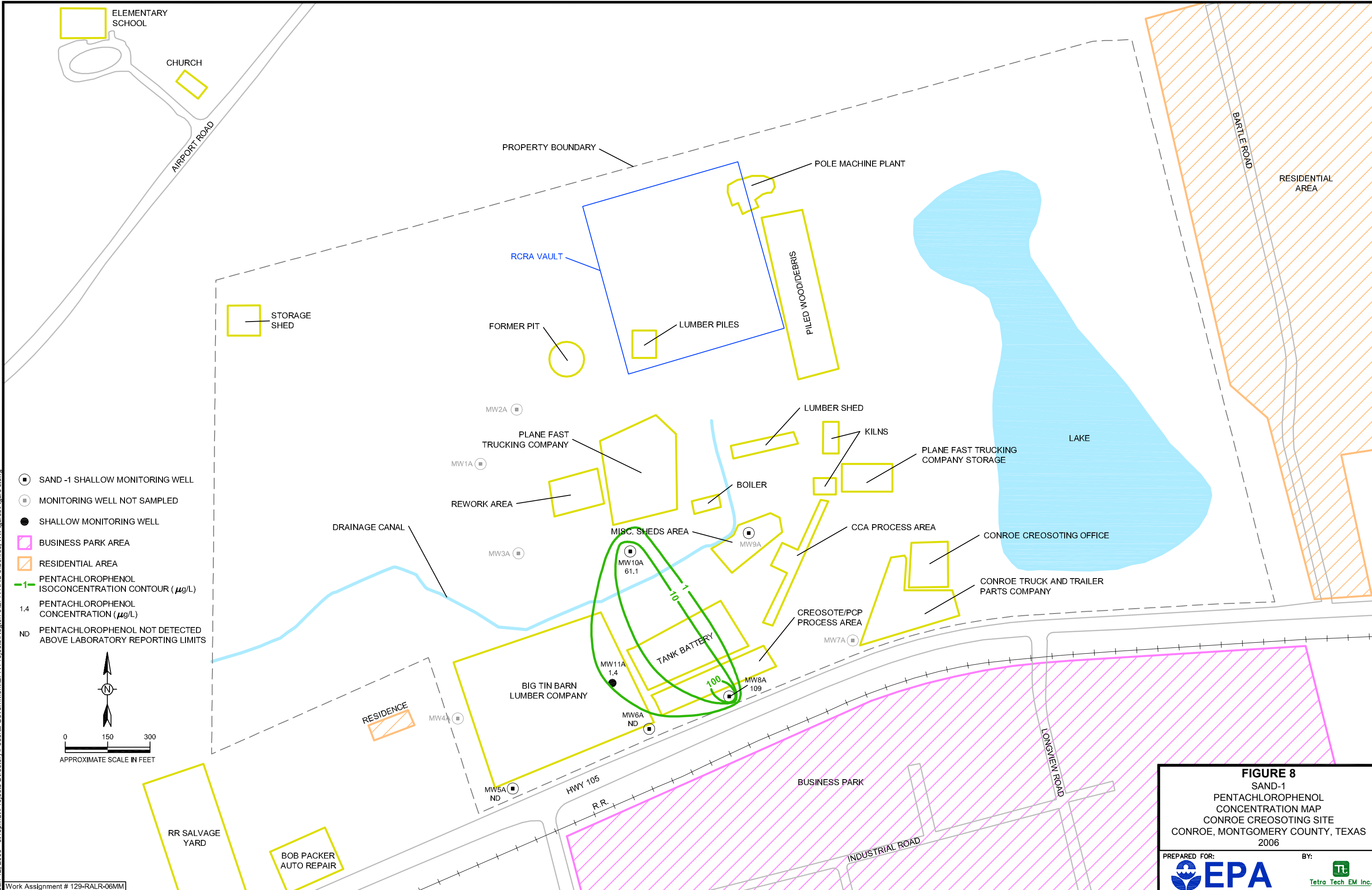
**US EPA REGION 6  
START-2**

**FIGURE 7**  
SAND-1  
PENTACHLOROPHENOL  
CONCENTRATION MAP  
CONROE CREOSOTING SITE  
CONROE, MONTGOMERY COUNTY, TEXAS  
2003

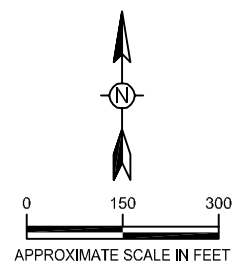
DATE JUN 03	PROJECT NO 12632.001.143.2335	SCALE AS SHOWN
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Jan 12, 2006 - 3:45pm S:\Projects\Directory\Federal Government\EPA Projects\Region 6\EPA RAC 6\Conroe, TX\Figures\Figure 8.dwg



- SAND -1 SHALLOW MONITORING WELL
- MONITORING WELL NOT SAMPLED
- SHALLOW MONITORING WELL
- BUSINESS PARK AREA
- ▨ RESIDENTIAL AREA
- PENTACHLOROPHENOL ISOCONCENTRATION CONTOUR (µg/L)
- 1.4 PENTACHLOROPHENOL CONCENTRATION (µg/L)
- ND PENTACHLOROPHENOL NOT DETECTED ABOVE LABORATORY REPORTING LIMITS



**FIGURE 8**  
 SAND-1  
 PENTACHLOROPHENOL  
 CONCENTRATION MAP  
 CONROE CREOSOTING SITE  
 CONROE, MONTGOMERY COUNTY, TEXAS  
 2006

PREPARED FOR: BY:

<b>Table 1 Chronology of Site Events Conroe Superfund Site Conroe, Texas</b>	
<b>Date</b>	<b>Event</b>
1946 through 1997	Site operated as a wood treating facility
1988	TCEQ conducts Compliance Evaluation Investigations at the site
1991	TCEQ conducts Compliance Evaluation Investigations at the site
1993	TCEQ conducts Compliance Evaluation Investigations at the site
1994	Violations documented result in issuance of Agreed Order
20 September 1996	JHA Environmental Services, Inc. conducts Environmental Site Assessment to determine if contamination existed in nine discrete areas of the facility with regard to surface soils, subsurface soils, and shallow groundwater. Creosote compounds, arsenic, and chromium contamination was determined to be found in the soil samples analyzed. Creosote compounds, chromium, and Biochemical Oxygen Demand (BOD) were determined to be in the groundwater samples analyzed.
March 1997	Site closed down by Montgomery County Tax Assessor/Collector due to delinquent taxes
1999	Violations documented result in issuance of Agreed Order
2000	The facility was referred to the State Attorney General's Office for noncompliance with the provisions of the 1999 Order
22 March 2001	Heavily contaminated soil was documented by JHA Environmental Services in CCA, PCP, and creosote processing areas
22 March 2001	TCEQ inspectors observe leaking containers at the site
1 June 2001	JHA Environmental Services prepared an inventory of the on-site tanks and cylinders and of the type of material that they contain or previously contained
Week of 26 November 2001	Releases were sampled and hazardous substances were detected in soils and sediments and an alleged waste burial area was determined by TCEQ to be a hazardous waste dumping area.
January 2002	EPA Region 6 Superfund Technical Assessment and Response Team (START-2) conducted a Removal Assessment of the facility. The tanks, cylinders, impoundments, drums and soils were sampled and analyzed for volatile organic compounds, semivolatile organic compounds, and metals. In addition, five soil samples were analyzed for dioxins and furans. An initial estimate of approximately 65,000 cubic yards of soils exceeded the EPA Region 6 Human Health MSSL for either arsenic, chromium, pentachlorophenol, total creosote compounds, or dioxin and furans.
June 2002	Removal Assessment confirmed that 77 aboveground storage tanks (ASTs) and other vessels (four surface water impoundments, 75 drums, and a laboratory with various-sized containers and jars) were present on-site. A total of 34 soil/sediment samples, six surface water samples, five dioxin/furan soil samples, and 44 waste liquid samples were collected and analyzed during the Removal Assessment. Based on the analytical data received, surface and subsurface soil constituents exceeded the EPA Region 6 Screening Guidance dated November 2001 for arsenic, chromium, PCP, total creosote, or dioxin/furan compounds. An estimated total of 540,000 gallons of liquid, sludge, and contaminated water and approximately 11,000 pounds of copper and ammonia sulfate in a granular form were identified on-site.
2 July 2002	EPA issued a General Notice letter to the Conroe Creosoting Company for the removal action at the Site
July 2002	Off-site Assessment was conducted by START-2 in 2002 and 2003. The primary objective of the assessment was to determine the nature and extent of the site-related, wood treating contaminants in off-site drainage pathways including Stewart's Creek and Little Caney Creek. A total of 425 sediment samples were collected during the assessment. Two sample locations within Stewart's Creek exceeded the Texas Risk Reduction Program (TRRP) values for Benzo(a)pyrene, Benzo(b)anthracene, Benzo(b)fluoranthene, and Dibenzo(a,h)anthracene and were addressed during the removal. No samples collected from Little Caney Creek were determined to have a potential threat to human health.
September 2002	Removal action was initiated and conducted under the direction of EPA of on-site structures and soils/sediments. RCRA vault of approximately 8 acres built on-site.
12 November 2002	A Superfund lien was filed on the Site property, pursuant to Section 107(1)(1) of CERCLA, 42 U.S.C. § 9607(1)(1).
14 November	EPA held open houses and workshop to update the community on activities at the Site



<b>Table 1</b>	
<b>Chronology of Site Events</b>	
<i>Conroe Superfund Site</i>	
<i>Conroe, Texas</i>	
2002	
December 2002	Expanded Site Investigation performed by TCEQ. The ESI included collecting and analyzing water samples from private and municipal water wells. The analytical results from the water samples indicated no presence of creosote compounds. However, the TCEQ ESI report stated that they observed the release of creosote from the site into Stewart's Creek during their sampling activities.
21- through 29 April 2003	Weston conducts Phase I RI activities consisting of 17 CPT technology. USGS performs geophysical survey.
29 April 2003	EPA held open houses and workshop to update the community on activities at the Site
April 2003	Additional sediment samples were collected from Stewart's Creek. The Stewart's Creek removal action included approximately 1,000 stream feet of sediments from the probable point of entry into Stewart's Creek down to State Highway 105. South of Highway 105, approximately 1,500 stream feet of Stewart's Creek sediments were also removed.
29 May 2003	EPA held open houses and workshop to update the community on activities at the Site
May 2003	Weston performs Phase II RI consisting of installing 24 groundwater wells and sampling those wells. Wells are sampled during three events during May and June 2003.
26 June 2003	EPA held open houses and workshop to update the community on activities at the Site
2 July 2003	A waiver of Special Notice letter for the RI/FS and RD/RA was issued to the Company
18 July 2003	Proposed Plan released
31 July 2003	Public Meeting held
July 2003	Remedial Investigation Report submitted by Weston
July 2003	Feasibility Study report submitted
22 September 2003	The Site was placed on the Superfund NPL
29 September 2003	Record of Decision finalized
September 2003	Removal Report submitted by Weston
September 2003	Preliminary Close out Report submitted
1 through 3 November 2005	Groundwater sampling of on-site wells performed by Tetra Tech EM Inc.
13 January 2006	November 2005 Groundwater Sampling Report submitted.
6 through 9 February 2006	Groundwater sampling of on-site wells performed by Tetra Tech EM Inc.
13 April 2006	February 2006 Groundwater Sampling Report submitted
26 through 28 September 2006	In Situ Chemical Oxidation Pilot Test performed
10 through 17 October 2006	Groundwater sampling of on-site wells performed by EA Engineering Science and technology, Inc.
January 2007	MW-8A (damaged during ISCO pilot test) abandoned
13 February 2007	ISCO Pilot Test and October 2006 Groundwater Sampling Report submitted.
2007	Three new groundwater wells installed to replace those damaged during ISCO pilot test
May 2008	MW-10A and MW-10B(damaged during ISCO pilot test) abandoned
June 23 – 27 2008	Second ISCO Pilot Test performed

**HISTORICAL PENTACHLOROPHENOL CONCENTRATIONS IN GROUND WATER  
(MAY 2003 - JUNE 2003)**

Monitoring Well ID	May 7 to 21 2003 (µg/L)	May 27 to 30 2003 (µg/L)	June 17 to 20 2003 (µg/L)
<b>SAND-1 Shallow Monitoring Wells</b>			
MW-1A	<10	<5	--
MW-2A	<10	<5	--
MW-3A	<10	0.68 J	--
MW-4A	<10	<5	--
MW-5A	<10	<5	--
MW-6A	<10	<5	--
MW-7A	<10	<5	--
MW-8A	<b><i>17.1</i></b>	<b><i>6.6</i></b>	<5
MW-9A	<10	<5	--
MW-10A	<10	<5	<5
MW-11A	<10	<5	--
<b>SAND-1 Deep Monitoring Wells</b>			
MW-1B	<10	<5	--
MW-2B	<10	<5	--
MW-3B	<10.8	<5	--
MW-4B	<10	<5	--
MW-5B	<10	<5	--
MW-6B	<10	<5	--
MW-7B	<10	<5	--
MW-8B	<10	<5	<5
MW-9B	<10	<5	--
MW-10B	<b><i>27.6</i></b>	<b><i>94</i></b>	2.3
<b>SAND-2 Monitoring Wells</b>			
MW-12	--	<5	--
MW-13	--	<5	--
MW-14	--	<10	--

NOTES: ***Bold, italicized*** entry indicates an exceedance of the Maximum Contaminant Level.  
 --No data available

**TABLE 3**  
**HISTORICAL PENTACHLOROPHENOL CONCENTRATIONS IN GROUND WATER**  
**(NOVEMBER 2005 - OCTOBER 2006)**

Monitoring Well ID	November 2005 <sub>1</sub> (µg/L)	February 2006 (µg/L)	October 2006 (µg/L)
<b>SAND-1 Shallow Monitoring Wells</b>			
MW-1A	--	--	<1.0
MW-2A	--	--	<1.0
MW-3A	--	<0.9	<1.0
MW-4A	--	--	<1.0
MW-5A	<1.0	<0.9	<1.0
MW-6A	<1.0	<0.9	<1.0
MW-7A	--	<1.0	<1.0
MW-8A	<b><i>109</i></b>	<b><i>13.3</i></b>	<b><i>78.7</i></b>
MW-9A	<1.0	<1.0	<1.0
MW-10A	<b><i>61.1</i></b>	--	<b><i>1.3</i></b>
MW-11A	<b><i>1.4</i></b>	<0.9	<b><i>1.6</i></b>
<b>SAND-1 Deep Monitoring Wells</b>			
MW-1B	--	--	<1.0
MW-2B	--	--	<1.0
MW-3B	--	<0.9	<1.0
MW-4B	--	--	<1.0
MW-5B	<1.0	<0.9	<1.0
MW-6B	<1.0	<1.0	<1.0
MW-7B	--	<0.9	<1.0
MW-8B	<1.0	<1.0	<1.0
MW-9B	<0.9	<0.9	<1.0
MW-10B	<b><i>713</i></b>	--	<b><i>7.0</i></b>
<b>SAND-2 Monitoring Wells</b>			
MW-12	--	--	<1.0
MW-13	--	--	<1.0
MW-14	--	<1.0	<1.0

NOTES: ***Bold, italicized*** entry indicates an exceedance of the Maximum Contaminant Level. --No data available

# **Attachment 1**

## **Documents Reviewed**

U.S. Environmental Protection Agency (EPA), 2001. *Comprehensive Five-Year Review Guidance*. OSWER No. 9355.7-03B-P. June 2001.

U.S. Environmental Protection Agency (EPA), 2003. *Off-Site Assessment Report Conroe Creosoting Site 1776 East Davis Conroe, Montgomery County. Texas*. July 2003

U.S. Environmental Protection Agency (EPA), 2003. *Remedial Investigation Report Conroe Creosoting Site 1776 East Davis Conroe, Montgomery County. Texas*. July 2003

U.S. Environmental Protection Agency (EPA), 2003. *Feasibility Study Report Conroe Creosoting Superfund Site Conroe, Montgomery County. Texas*. July 2003

U.S. Environmental Protection Agency (EPA), 2003. *Conroe Creosote Human Health Risk Assessment*. July 2003

U.S. Environmental Protection Agency (EPA), 2003. *Conroe Creosote Ecological Risk Assessment*. July 2003

U.S. Environmental Protection Agency (EPA), 2003. *Conroe Creosoting Superfund Site Conroe, Montgomery County. Texas*. Proposed Plan July 2003

U.S. Environmental Protection Agency (EPA), 2003. *Superfund Record of Decision Conroe Creosoting Company Montgomery County. Texas*. September 2003

U.S. Environmental Protection Agency (EPA), 2003. *Removal Report for Conroe Creosoting Site 1776 East Davis Conroe, Montgomery County. Texas*. September 2003

U.S. Environmental Protection Agency (EPA), 2003 *Preliminary Close Out Report Conroe Creosoting Company Superfund Site 1776 East Davis Conroe, Montgomery County. Texas*. September 2003

U.S. Environmental Protection Agency (EPA), *Conroe Creosoting Company Conroe. Texas Work Plan for Long-Term Remedial Action*

Tetra Tech EM Inc. 2005 *Submittal of Quarterly Ground Water Monitoring Report Conroe Creosoting Company Conroe, Montgomery County. Texas*. November 2005

Tetra Tech EM Inc. 2006 *Submittal of Quarterly Ground Water Monitoring Report Conroe Creosoting Company Conroe, Montgomery County, Texas*. February 2006

EA Engineering Science and Technology, Inc. 2007 *Technical Memorandum September 06 In Situ Chemical Oxidation Pilot Test and October 06 Groundwater Sampling Activities Conroe Creosoting Company Site Conroe, Long-Term Response Action*. February 2007

EA Engineering Science and Technology, Inc. 2007 *Supplemental Pilot Test Work Plan (Revision 1) Conroe Creosoting Company Site Conroe, Long-Term Response Action*. October 2007

# **Attachment 2**

## **Interview Record Forms**

<b>Five-Year Review Interview Record</b> Conroe Creosoting Company Superfund Site Conroe, Texas		<b>Interviewee:</b> Gary Baumgarten <b>Phone:</b> 214-665-6749 <b>email:</b> baumgarten.gary@epa.gov		
<b>Site Name:</b> Conroe Creosoting Company Superfund Site	<b>EPA ID No.</b> TXD008091951		<b>Date of Interview</b> June 20, 2008	<b>Interview Method</b> E-mail
<b>Interview Contacts</b>	<b>Organization</b>	<b>Phone</b>	<b>Email</b>	<b>Address</b>
<b>Interview Questions</b> (scope of the interview is from 2002 to present)				
1. What is your overall impression of the work conducted at the site since 2002?				
<p><b>Response:</b> Since the selected remedy for groundwater is monitored natural attenuation of pentachlorophenol (PCP), there has not been much work conducted at the site. Although site remediation has been completed at the Conroe site, localized areas of elevated PCP concentrations remain in groundwater. It has been speculated that the PCP may have been introduced into the groundwater as a result of well construction activities. EPA implemented an in situ chemical oxidation (ISCO) pilot test program in September 2006 to evaluate whether localized PCP contamination in three on-site monitoring wells could be remediated using ISCO. Results from the ISCO pilot test suggest that this technology is not conducive to implementation via injection directly into monitoring wells, either due to existing groundwater conditions (high iron content) and/or poor well construction. Consequently, it is necessary to implement the ISCO pilot test using a different methodology. Therefore, EPA will conduct a second ISCO pilot study in June 2008 using direct-push injection.</p>				
2. From your perspective, what effect have remedial operations at the site had on the surrounding community? Are you aware of any ongoing community concerns regarding the site or its operation and maintenance?				
<p><b>Response:</b> Since cleanup activities have been completed, there have been a few inquiries about reuse opportunities at the site. I am not aware of any ongoing community concerns.</p>				
3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.				
<p><b>Response:</b> EPA has conducted groundwater sampling events and a supplemental pilot study at the Conroe site. The purpose of the groundwater sampling was to evaluate if the selected remedy for groundwater (natural attenuation) was working as expected. As discussed above, EPA conducted a supplemental pilot study to evaluate whether in situ chemical oxidation (ISCO) would be effective in treating localized areas of elevated PCP concentrations in groundwater. EPA will conduct a second ISCO supplemental pilot study in June 2008. Once the pilot study is complete, additional groundwater samples will be collected to evaluate the effectiveness of the ISCO treatment.</p>				
4. Are you aware of any events, incidents, or activities that have occurred at the site such as dumping, vandalism, or				



anything that required emergency response from local authorities? If so, please give details.

**Response:** No

5. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and result.

**Response:** No

6. Are you aware of any problems or difficulties encountered which impacted the effectiveness of the remedial action, or a change in O&M procedures? If so, please describe changes and impacts.

**Response:** The RCRA cell cap is in need of repair due to considerable erosion of the cap and lack of vegetative cover. The Texas Commission on Environmental Quality (TCEQ) who has responsibility for O&M at the site is evaluating options and cost to repair the cap.

7. Have there been any changes in state or federal environmental standards since 2002 which may call into question the protectiveness or effectiveness of the remedial action?

**Response:** No.

8. Do you know of opportunities to optimize the operation, maintenance, or sampling efforts at the site since 2002, and have such changes been implemented?

**Response:** As noted above, the TCEQ is evaluating options and cost to repair the RCRA cell cap. If the supplemental ISCO pilot study is successful in treating the PCP in groundwater, groundwater sampling can be reduced and ultimately eliminated. Depending on the ISCO results, the remaining monitoring wells could be plugged and abandoned if groundwater sampling indicates that PCP is no longer present in groundwater.

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

**Response:** Yes.

10. Do you have any comments, suggestions, or recommendations regarding the site?

**Response:** No

<b>Five-Year Review Interview Record</b> Conroe Creosoting Company Superfund Site Conroe, Texas		<b>Interviewee:</b> Mr. Jeffrey Patterson Phone: 512 239-2489 email: jepatter@tceq.state.tx.org		
<b>Site Name:</b> Conroe Creosoting Company Superfund Site	<b>EPA ID No.</b> TXD008091951	<b>Date of Interview</b> August 4 2008	<b>Interview Method</b> E-mail	
<b>Interview Contacts</b>	<b>Organization</b> TCEQ Project Manager and Site O&M Manager	<b>Phone</b> 512 239- 2489	<b>Email</b> jepatter@tceq.state.tx.org	<b>Address</b>
<b>Interview Questions</b> (scope of the interview is from 2003 to present)				
1. What is your overall impression of the work conducted at the site since 2003?				
<b>Response:</b> EPA has conducted groundwater monitoring and attempted groundwater treatment. TCEQ has begun plans to restore side slope of the cap.				
2. From your perspective, what effect have remedial operations at the site had on the surrounding community? Are you aware of any ongoing community concerns regarding the site or its operation and maintenance?				
<b>Response:</b> None.				
3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.				
<b>Response:</b> Inspections of the cap have occurred.				
4. Are you aware of any events, incidents, or activities that have occurred at the site such as dumping, vandalism, or anything that required emergency response from local authorities? If so, please give details.				
<b>Response:</b> None that he is aware of.				
5. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and result.				
<b>Response:</b> None that he is aware of.				
6. Are you aware of any problems or difficulties encountered which impacted the effectiveness of the remedial action, or a change in O&M procedures? If so, please describe changes and impacts.				

**Response:** None.

7. Have there been any changes in state or federal environmental standards since 2002 which may call into question the protectiveness or effectiveness of the remedial action?

**Response:** None.

8. Do you know of opportunities to optimize the operation, maintenance, or sampling efforts at the site since 2002, and have such changes been implemented?

**Response:** This will be considered during development of an O&M plan in FY08.

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

**Response:** Yes.

10. Do you have any comments, suggestions, or recommendations regarding the site?

**Response:** The State remains concerned about costs of repairing the cap which appear to be the result of inadequate establishment of vegetation and possibly poor cap design. Side slopes are too steep.

<b>Five-Year Review Interview Record</b> Conroe Creosoting Company Superfund Site Conroe, Texas		<b>Interviewee:</b> Mr. Jerry McGuire Phone: 936 522-3001 email: admin@cityofconroe.org		
<b>Site Name:</b> Conroe Creosoting Company Superfund Site	<b>EPA ID No.</b> TXD008091951	<b>Date of Interview</b> August 4 2008	<b>Interview Method</b> Telephone	
<b>Interview Contacts</b>	<b>Organization</b> Conroe City Administrator	<b>Phone</b> 936 522- 3001	<b>Email</b> admin@cityofconroe.org	<b>Address</b>
<b>Interview Questions</b> (scope of the interview is from 2003 to present)				
1. What is your overall impression of the work conducted at the site since 2003?				
<b>Response:</b> Mr. McGuire is aware that there is a landfill of sorts at the site in addition to monitoring wells, but he is not aware of what work activities are ongoing at the site.				
2. From your perspective, what effect have remedial operations at the site had on the surrounding community? Are you aware of any ongoing community concerns regarding the site or its operation and maintenance?				
<b>Response:</b> Mr. McGuire indicated that any communications he has been involved with revolve around inquiries concerning development potential of the site. A significant amount of commercial development is occurring in the section of town that the Conroe site is located within. Because the Conroe site is listed for sale, developers have inquired about the site, primarily relating the status of the site regarding its superfund status and/or land classification (industrial verses residential land use). Mr. McGuire is aware that portion(s) of the site, mainly the vault/landfill area, may not be available for sale or reuse. He expressed his dismay at not being able to obtain answers from the EPA relevant to questions that developers have brought up regarding the Conroe site. He stated that he is aware that there is some type of agreement established by the EPA and the developer (or current site owner) regarding the site, but he has not been able to obtain that agreement.				
3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.				
<b>Response:</b> No				
4. Are you aware of any events, incidents, or activities that have occurred at the site such as dumping, vandalism, or anything that required emergency response from local authorities? If so, please give details.				
<b>Response:</b> No				

5. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and result.

**Response:** No

6. Are you aware of any problems or difficulties encountered which impacted the effectiveness of the remedial action, or a change in O&M procedures? If so, please describe changes and impacts.

**Response:** No

7. Have there been any changes in state or federal environmental standards since 2002 which may call into question the protectiveness or effectiveness of the remedial action?

**Response:** No

8. Do you know of opportunities to optimize the operation, maintenance, or sampling efforts at the site since 2002, and have such changes been implemented?

**Response:** No

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

**Response:** Mr. McGuire's initial response to this question was "not really". As discussed in question 2, his main communications revolved around potential development of the site. He stated that he has tried to obtain a copy of the "Final Order" for the site submitted when the site was closed. This document would provide information of the site concerning any deed restrictions for the site which may affect future land use.

10. Do you have any comments, suggestions, or recommendations regarding the site?

**Response:** Mr. McGuire stated that he basically would like to see the site redeveloped. He stated that there is currently some apprehension by potential developers for this site and for sites in close proximity to this site because of the unknown status surrounding the Conroe site.

# **Attachment 3**

## **Site Inspection Checklist**

## Five-Year Review Site Inspection Checklist

I. SITE INFORMATION			
<b>Site name:</b> Conroe Superfund Site	<b>Date of inspection:</b> May 21, 2008		
<b>Location and Region:</b> Conroe, TX	<b>EPA ID:</b> TXD008091951		
<b>Agency, office, or company leading the Five-Year Review:</b> USACE	<b>Weather/temperature:</b> clear, sunny, 80-85° F		
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Landfill cover/containment                Access controls  <input checked="" type="checkbox"/> Institutional controls                Groundwater pump and treatment                Surface water collection                Other: _____             </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Monitored natural attenuation                Groundwater containment (Cap)                Vertical barrier walls             </td> </tr> </table>		<input checked="" type="checkbox"/> Landfill cover/containment Access controls <input checked="" type="checkbox"/> Institutional controls Groundwater pump and treatment Surface water collection Other: _____	<input checked="" type="checkbox"/> Monitored natural attenuation Groundwater containment (Cap) Vertical barrier walls
<input checked="" type="checkbox"/> Landfill cover/containment Access controls <input checked="" type="checkbox"/> Institutional controls Groundwater pump and treatment Surface water collection Other: _____	<input checked="" type="checkbox"/> Monitored natural attenuation Groundwater containment (Cap) Vertical barrier walls		
<b>Attachments:</b> Inspection team roster attached                      Site map attached <i>Inspection Team: David Jones and Frank Roepke of USACE; Gary Baumgarten of EPA; Jeff Patterson of TCEQ</i>			
II. INTERVIEWS (Check all that apply)			
<b>1. O&amp;M site manager</b> Name: <b>Jeff Patterson</b> Title: Site O&M Manager                      Date: 6/30/08 Interviewed <input checked="" type="checkbox"/> at site    at office <input checked="" type="checkbox"/> by phone    Phone no. (281) 831-2107 Problems, suggestions: <i>see interview form</i>			
<b>2. EPA RPM</b> Name: <b>Gary Baumgarten</b> Title: Remedial Project Manager                      Date: 6/20/08 Interviewed    at site    at office    by phone (Interview form e-mailed to Mr. Miller) Phone no. (214) 665-8318 Problems, suggestions: <i>see interview form</i>			



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 Texas Commission on Environmental Quality  
 Contact  
 Name: **Jeff Patterson** (same as # 2 above) Title O&M Manager Date Phone no.  
 (512) 239-2531  
 Problems; suggestions:

\_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions; Report attached \_\_\_\_\_

\_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions; Report attached \_\_\_\_\_

\_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions; Report attached \_\_\_\_\_

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

Interview record forms are provided in Attachment 2 to the Five-Year Review.

<b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)				
1.	<b>O&amp;M Documents</b> O&M manual As-built drawings O&M logs Remarks: <i>No O&amp;M documents for RCRA vault created/maintained.</i>	Readily available Readily available Readily available	Up to date Up to date Up to date	N/A N/A N/A
2.	<b>Site-Specific Health and Safety Plan</b> Contingency plan/emergency response plan Remarks: <i>No SSHP created for the O&amp;M plan/site.</i>	Readily available Readily available	Up to date Up to date	N/A N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks: <i>No records of any kind available.</i>	Readily available	Up to date	✓ N/A
4.	<b>Permits and Service Agreements</b> Air discharge permit Effluent discharge Waste disposal, POTW Other permits _____ Remarks: <i>No discharge permit is required.</i>	Readily available Readily available Readily available Readily available	Up to date Up to date Up to date Up to date	✓ N/A ✓ N/A ✓ N/A ✓ N/A
5.	<b>Gas Generation Records</b> Remarks:	Readily available	Up to date	✓ N/A
6.	<b>Settlement Monument Records</b> Remarks:	Readily available	Up to date	✓ N/A
7.	<b>Groundwater Monitoring Records</b> Remarks: <i>Records/reports available.</i>	✓ Readily available	✓ Up to date	N/A
8.	<b>Leachate Extraction Records</b> Remarks: <i>Leachate collection system only checked once in five years. Data suggests significant amount of leachate present that needs to be remediated..</i>	Readily available	Up to date	N/A
9.	<b>Discharge Compliance Records</b> Air ✓ Water (effluent) Remarks: <i>Do not know what happened to collected leachate. No records available.</i>	Readily available Readily available	Up to date Up to date	✓ N/A N/A
10.	<b>Daily Access/Security Logs</b> Remarks: <i>The current owner leases the ability for a local trucking company to park/stage vehicles on the southeastern portion of the site. Site access remains "open" during most normal business hours.</i>	Readily available	Up to date	N/A
<b>IV. O&amp;M COSTS</b>				
1.	<b>O&amp;M Organization</b> ✓ State in-house PRP in-house Federal Facility in-house Remarks: <i>State contractor is ___ but they only performed maintenance once over the last five years..</i>	✓ Contractor for State Contractor for PRP Contractor for Federal Facility		

2.	<p><b>O&amp;M Cost Records</b>  Readily available                      Up to date  Funding mechanism/agreement in place (entirely funded by PRP)  Original O&amp;M cost estimate              Breakdown attached</p> <p style="text-align: center;">Total annual cost by year for review period if available</p> <table border="0"> <tr> <td>From</td> <td>Breakdown attached</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Date 1/1/2002</td> <td>Date 12/31/2002</td> <td>Total cost</td> </tr> <tr> <td>From</td> <td>Breakdown attached</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Date 1/1/2003</td> <td>Date 12/31/2003</td> <td>Total cost</td> </tr> <tr> <td>From</td> <td>Breakdown attached</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Date 1/1/2004</td> <td>Date 12/31/2004</td> <td>Total cost</td> </tr> <tr> <td>From</td> <td>Breakdown attached</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Date 1/1/2005</td> <td>Date 12/31/2005</td> <td>Total cost</td> </tr> <tr> <td>From</td> <td>Breakdown attached</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Date 1/1/2006</td> <td>Date 12/31/2006</td> <td>Total cost</td> </tr> </table>	From	Breakdown attached				Date 1/1/2002	Date 12/31/2002	Total cost	From	Breakdown attached				Date 1/1/2003	Date 12/31/2003	Total cost	From	Breakdown attached				Date 1/1/2004	Date 12/31/2004	Total cost	From	Breakdown attached				Date 1/1/2005	Date 12/31/2005	Total cost	From	Breakdown attached				Date 1/1/2006	Date 12/31/2006	Total cost
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3.	<p><b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b>  Describe costs and reasons:</p>																																								
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> Applicable    N/A																																									
<b>A. Fencing</b>																																									
1.	<p><b>Fencing damaged</b>                      Location shown on site map              Gates secured              N/A  Remarks: <i>Due to erosion of some slopes of the RCRA vault, there are several gaps between ground surface and the bottom of the fence surrounding the vault. Fencing surrounding the entire Conroe site is minimal; most is simple four-strand barb wire. A section of the four-strand barb wire fence has been cut at the northwest corner off the site. It is noted that this same "break" is noted in 2003 site documents. ATV tracks were visible at this location.</i></p>																																								
<b>B. Other Access Restrictions</b>																																									
1.	<p><b>Signs and other security measures</b>                      Location shown on site map              N/A  Remarks: <i>Signs posted every 50 yards along the vault fence. No signs posted along the Conroe site proper fence.</i></p>																																								

<b>C. Institutional Controls (ICs)</b>			
1.	<b>Implementation and enforcement</b>		
	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: <i>groundwater compliance</i>		
	Frequency: <i>quarterly and annual</i>		
	Responsible party/agency: <i>EPA</i>		
	Contact:		
	Name: Gary Baumgarten	Title	Date
			Phone no. (214) 665-6749
	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
	Remarks: <i>The EPA has attempted to negotiate an Administrative Order on Consent or other mechanism implementing a property easement and/or other appropriate controls with the landowner of the Site, but has been unsuccessful. No deed restrictions have been filed in Montgomery County to date.</i>		
2.	<b>Adequacy</b>	ICs are adequate	✓ ICs are inadequate N/A
	Remarks: .		
<b>D. General</b>			
1.	<b>Vandalism/trespassing</b>	Location shown on site map	No vandalism evident
	Remarks <i>A section of the four-strand barb wire fence has been cut at the northwest corner off the site. ATV tracks were visible at this location. Located centrally within the site is a potential ATV course; this is a series of stacked/placed tires on a flat dirt area. No tracks were evident.</i>		
2.	<b>Land use changes on site</b>	N/A	
	Remarks: Site is remediated to industrial standards. The current owner leases the ability for a local trucking company to park/stage vehicles on the southeastern portion of the site. Site access remains "open" during most normal business hours.		
3.	<b>Land use changes off site</b>	✓ N/A	
	Remarks _____		
	_____		
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b>	✓ Applicable	N/A	
1.	<b>Roads damaged</b>	Location shown on site map	✓ Roads adequate N/A
	Remarks:		

<b>B. Other Site Conditions</b>			
Remarks _____ _____ _____ _____ _____			
<b>VII. ENGINEERED COVERS</b> ✓ Applicable    N/A			
<b>A. Surface</b>			
1.	<b>Settlement</b> (Low spots) Areal extent _____ Remarks:	Location shown on site map Depth _____	✓ Settlement not evident
2.	<b>Cracks</b> Lengths _____    Widths _____ Remarks _____	Location shown on site map Depths _____	Cracking not evident
3.	<b>Erosion</b> Areal extent _____  Remarks: <i>See note for item 9</i>	Location shown on site map Depth _____	Erosion not evident
4.	<b>Holes</b> Areal extent _____ Remarks <i>See note for item 9</i>	Location shown on site map Depth _____	Holes not evident
5.	<b>Vegetative Cover</b> Grass    Cover properly established Trees/Shrubs (indicate size and locations on a diagram)  Remarks: <i>No trees present, however, the cover was not maintained from 2003 until fall of 2007. In the fall 2007, a contractor groomed the cover. Based on both conversations with O&amp;M manager and EPA manager, and the abundant presence of pine trees growing up to the base of the landfill, it is assumed that many pine trees up to 6 feet tall were removed from the landfill cover during the grooming process. Presently, no to very little vegetative cover is present over the entire vault area.</i>		No signs of stress
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks _____		✓ N/A
7.	<b>Bulges</b> Areal extent _____ Remarks	Location shown on site map Height _____	✓ Bulges not evident

8.	<b>Wet Areas/Water Damage</b> Wet areas Ponding Seeps Soft subgrade	Wet areas/water damage not evident Location shown on site map Location shown on site map Location shown on site map Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
Remarks: <i>The toes of the side slopes of the vault's four sides are graded to provide drainage to natural site features. Approximately 40% of the northern side's drainage feature/ditch allows for standing water, as observed by standing water and/or cattails.</i>			
9.	<b>Slope Instability</b> Slides Areal extent _____	Location shown on site map	No evidence of slope instability
Remarks: <i>Extensive erosional channels evident along entire extent of slopes of the vault. Depth of channels average one foot deep; some are as deep as 2 feet. Landfill cover geotextiles are visible in approximately 30 locations due to this erosion. It is assumed that the contractor that groomed the cover in the fall of 2007, repaired some erosional channels of the top cover?</i>			
<b>B. Benches</b> 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.	<b>Flows Bypass Bench</b> Remarks	Location shown on site map	okay
2.	<b>Bench Breached</b> Remarks	Location shown on site map	okay
3.	<b>Bench Overtopped</b> Remarks	Location shown on site map	okay
<b>C. Letdown Channels</b> 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.	<b>Settlement</b> Areal extent _____ Remarks _____	Location shown on site map Depth _____	No evidence of settlement
2.	<b>Material Degradation</b> Material type _____ Remarks _____	Location shown on site map Areal extent _____	No evidence of degradation
3.	<b>Erosion</b> Areal extent _____ Remarks:	Evidence of Erosion Depth _____	No evidence of erosion
4.	<b>Undercutting</b> Remarks:	Evidence of undercutting	No evidence of undercutting

5.	<b>Obstructions</b>	Type_____	No obstructions
	Location shown on site map		Areal extent_____
	Size_____		
	Remarks_____		
6.	<b>Excessive Vegetative Growth</b>	Type_____	
	No evidence of excessive growth		
	Vegetation in channels does not obstruct flow		
	Location shown on site map		Areal extent_____
	Remarks_____		
<b>D. Cover Penetrations</b> ✓ Applicable    N/A			
1.	<b>Gas Vents</b>	Active    Passive	
	Properly secured/locked	Functioning	Routinely sampled    Good condition
	Evidence of leakage at penetration	Needs Maintenance	
	N/A		
	Remarks:_____		
2.	<b>Gas Monitoring Probes</b>		
	Properly secured/locked	Functioning	Routinely sampled    Good condition
	Evidence of leakage at penetration	Needs Maintenance	N/A
	Remarks_____		
3.	<b>Monitoring Wells</b> (within surface area of landfill)		
	Properly secured/locked	Functioning	Routinely sampled    Good condition
	Evidence of leakage at penetration	Needs Maintenance	N/A
	Remarks_____		
4.	<b>Leachate Extraction Wells (dual purpose: same as gas vent wells)</b>		
	✓ Properly secured/locked	✓ Functioning	Routinely sampled    Good condition
	Evidence of leakage at penetration	Needs Maintenance	N/A
	Remarks: <i>Only one extraction point services the entire landfill/vault. It appeared in good condition but was locked such that complete inspection was not possible.</i>		
5.	<b>Settlement Monuments</b>	Located	Routinely surveyed    ✓ N/A
	Remarks:_____		

<b>E. Gas Collection and Treatment</b>		Applicable	✓ N/A
1.	<b>Gas Treatment Facilities</b> Flaring                      Thermal destruction                      Collection for reuse Good condition      Needs Maintenance Remarks _____ _____		
2.	<b>Gas Collection Wells, Manifolds and Piping</b> Good condition      Needs Maintenance Remarks _____		
3.	<b>Gas Monitoring Facilities</b> ( <i>e.g.</i> , gas monitoring of adjacent homes or buildings) Good condition      Needs Maintenance                      N/A Remarks _____ _____		
<b>F. Cover Drainage Layer</b>		Applicable	N/A
1.	<b>Outlet Pipes Inspected</b> Remarks _____ _____	Functioning	N/A
2.	<b>Outlet Rock Inspected</b> Remarks: <i>Concrete Pad.</i>	Functioning	N/A
<b>G. Detention/Sedimentation Ponds</b>		Applicable	✓ N/A
1.	<b>Siltation</b> Areal extent _____                      Depth _____                      N/A Siltation not evident Remarks _____		
2.	<b>Erosion</b> Areal extent _____                      Depth _____ Erosion not evident Remarks _____		
3.	<b>Outlet Works</b> Remarks _____ _____	Functioning	N/A
4.	<b>Dam</b> Remarks _____ _____	Functioning	N/A



<b>H. Retaining Walls</b>		Applicable	✓ N/A
1.	<b>Deformations</b> Horizontal displacement _____ Rotational displacement _____ Remarks _____	Location shown on site map	Deformation not evident Vertical displacement _____
2.	<b>Degradation</b> Remarks _____	Location shown on site map	Degradation not evident
<b>I. Perimeter Ditches/Off-Site Discharge</b>		✓ Applicable	N/A
1.	<b>Siltation</b> Areal extent _____ Remarks <i>The toes of the side slopes of the vault's four sides are graded to provide drainage to natural site features. Approximately 40% of the northern side's drainage feature/ditch allows for standing water, as observed by standing water and/or cattails.</i>	Location shown on site map	Siltation not evident Depth _____
2.	<b>Vegetative Growth</b> ✓ Vegetation does not impede flow Areal extent _____ Remarks: _____	Location shown on site map	N/A Type _____
3.	<b>Erosion</b> Areal extent _____ Remarks _____	Location shown on site map	✓ Erosion not evident Depth _____
4.	<b>Discharge Structure</b> Remarks <i>Off-site discharge pipe in good condition.</i>	✓ Functioning	N/A
<b>VIII. VERTICAL BARRIER WALLS</b>		Applicable	✓ N/A
1.	<b>Settlement</b> Areal extent _____ Remarks _____	Location shown on site map	Settlement not evident Depth _____
2.	<b>Performance Monitoring</b> Performance not monitored Frequency <i>Annual</i> Head differential _____ Remarks _____	Type of monitoring	<i>DNAPL compliance</i> Evidence of breaching

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> ✓ Applicable    N/A			
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b>		Applicable	✓ N/A
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> Good condition    All required wells properly operating    Needs Maintenance    N/A Remarks _____ _____		
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> Good condition    Needs Maintenance Remarks _____ _____		
3.	<b>Spare Parts and Equipment</b> Readily available    Good condition    Requires upgrade    Needs to be provided Remarks _____ _____		
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b>		Applicable	✓ N/A
1.	<b>Collection Structures, Pumps, and Electrical</b> Good condition    Needs Maintenance Remarks _____ _____		
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> Good condition    Needs Maintenance Remarks _____ _____		
3.	<b>Spare Parts and Equipment</b> Readily available    Good condition    Requires upgrade    Needs to be provided Remarks: _____ _____		

<b>C. Treatment System</b>		Applicable	✓	N/A
1.	<b>Treatment Train</b> (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 Remarks: _____ _____			
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) N/A                      Good condition    Needs Maintenance Remarks: _____ _____			
3.	<b>Tanks, Vaults, Storage Vessels</b> N/A                      Good condition    Proper secondary containment                      Needs Maintenance Remarks: _____			
4.	<b>Discharge Structure and Appurtenances</b> N/A                      Good condition    Needs Maintenance Remarks: _____ _____			
5.	<b>Treatment Building(s)</b> N/A                      Good condition (esp. roof and doorways)                      Needs repair Chemicals and equipment properly stored Remarks: <i>Sulfuric acid purchased as needed; not stored on site.</i>			
6.	<b>Monitoring Wells</b> (pump and treatment remedy) Properly secured/locked    Functioning                      Routinely sampled                      Good condition All required wells located                      Needs Maintenance                      N/A Remarks: <i>Static water levels measured monthly. Flow is checked daily.</i>			
<b>D. Monitoring Data</b>				
1.	Monitoring Data ✓ Is routinely submitted on time                                      ✓ Is of acceptable quality			

**F. 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: *Three monitoring wells have been rendered inoperable during an oxidation reagent injection activity. While those three wells have been replaced, the three damaged wells have not been abandoned.*

**X. OTHER REMEDIES**

If there are remedies applied at the site which are 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.).

*The initial part of the remedy, for site soils, has been completed and involved excavation and disposal of the waste within an on-site RCRA vault. The ongoing remedy is to maintain the vault cap such that placed wastes are contained and no contaminants released to the environment. Leachate from within the leachate collection system is to be tested and disposed of. The site inspection conducted May 21,, 2008 indicates that while the vault cap/cover appears to preventing contaminant release, the cover is in dire need of repair and yearly maintenance.*

*Regarding site groundwater: natural attenuation of contaminants within groundwater will be verified via groundwater monitoring, however, groundwater monitoring has not been performed on a regular basis. Contaminant concentrations are presently above MCLs, but trends can not be determined due to lack of consistent sampling events.*

**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.

*In order to speed up attenuation of the groundwater contaminants, in 2007 additional remedial activities incorporating oxidation reagent injection of the groundwater were initiated. The first trial injection in August 2007 was unsuccessful due to well construction and geologic conditions and resulted in rendering the three injection point wells inoperable. A second injection activity utilizing direct push technology was performed in June 2008. Sufficient data has not been collected to determine the success of this program.*

**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.

*Adequate funding for this site to the O&M and managing agencies appears to be the basic issue affecting protectiveness of the remedy.*

### **3.1.1. D. Opportunities for Optimization**

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

*Refer to Section 7.1 of the Five-Year Review (2007). Re-evaluate in next Five-Year Review.*

# **Attachment 4**

## **Site Inspection Photographs**



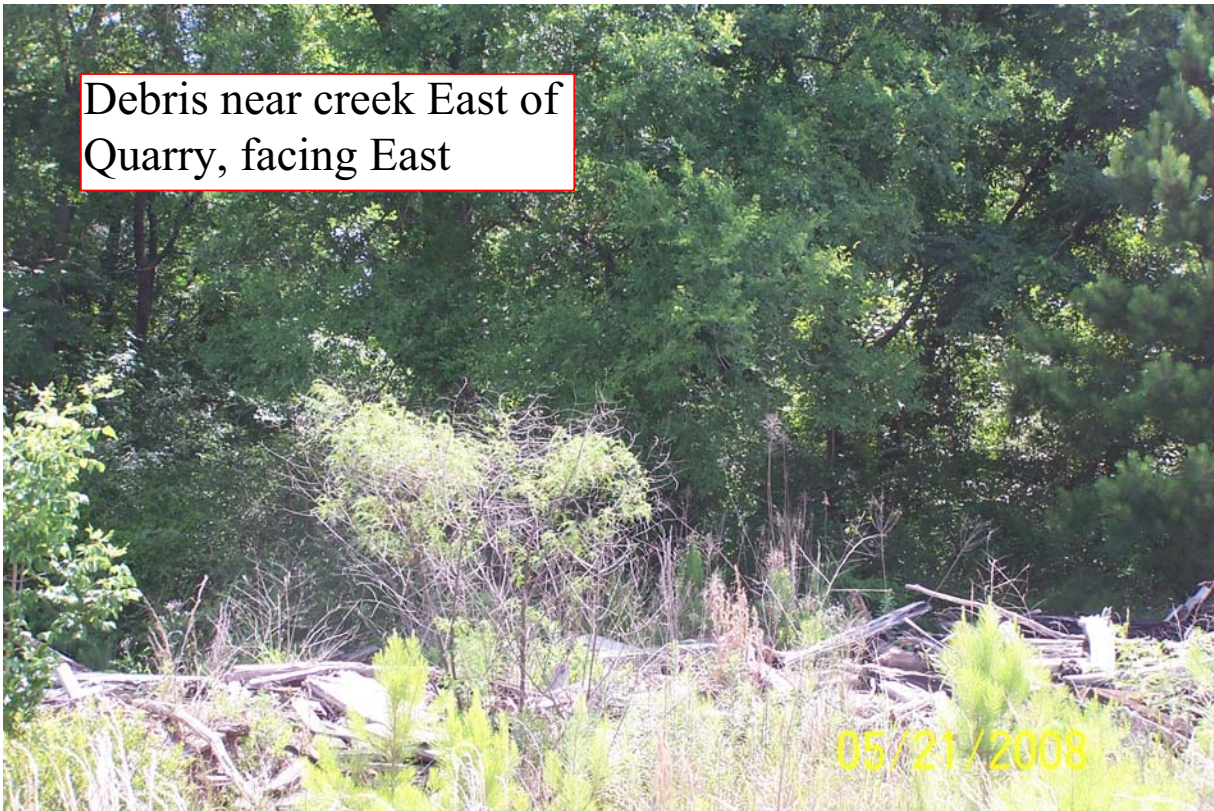
Entrance, facing West 05/21/2008



Old storage shed, facing West 05/21/2008



Vault, facing West 05/21/2008



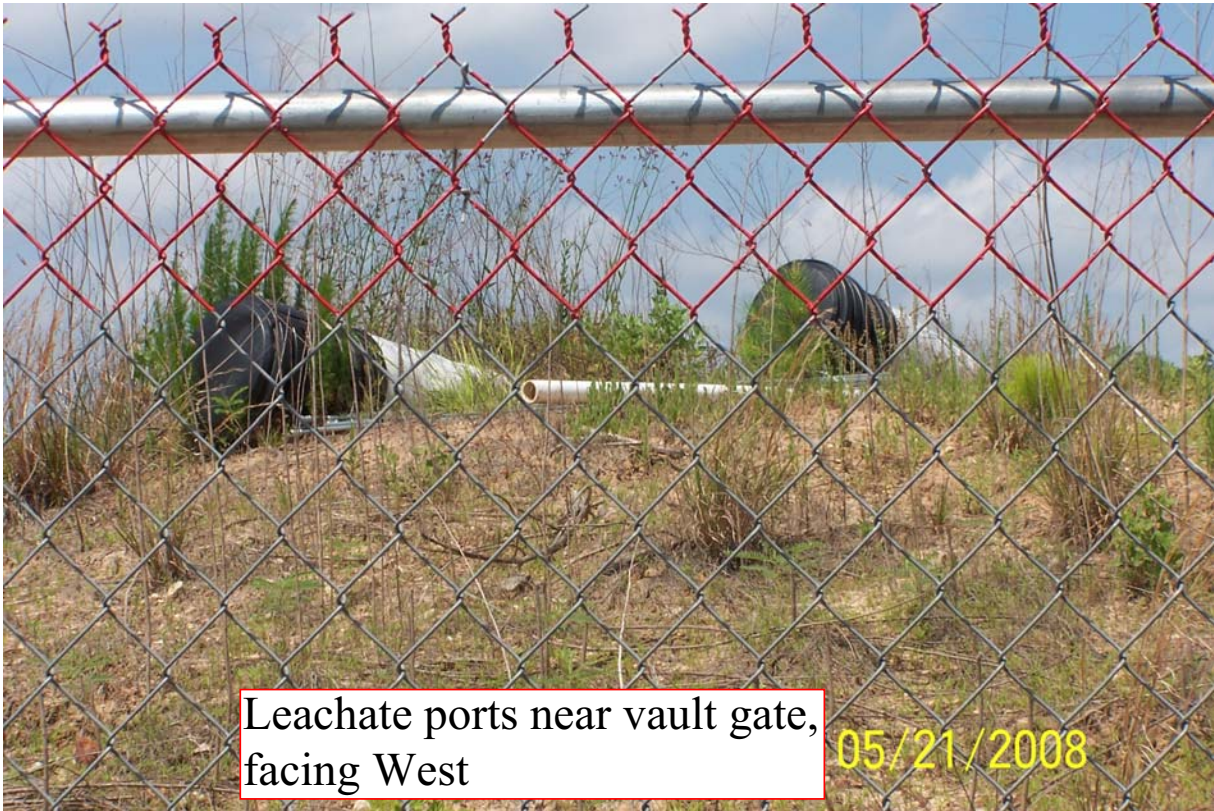
Debris near creek East of Quarry, facing East



Drums and signage near vault gate, facing West

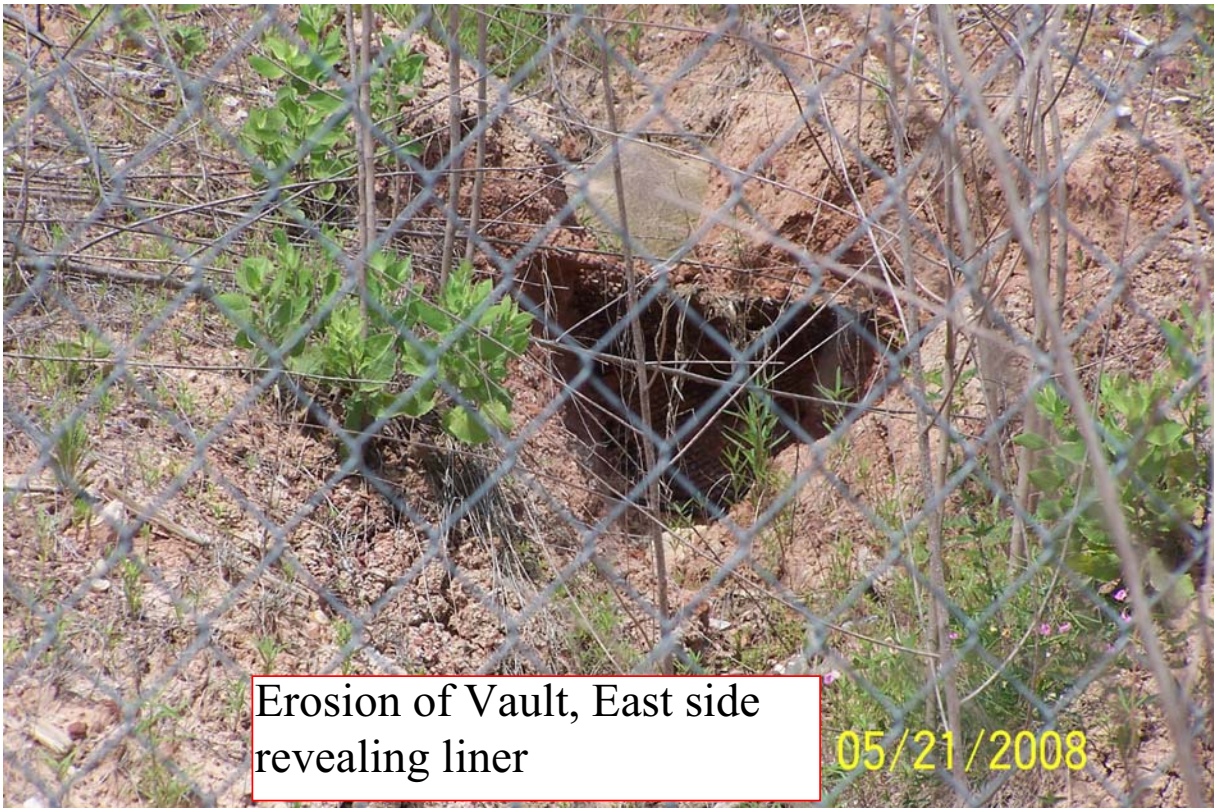


Erosion on vault near gate



Leachate ports near vault gate,  
facing West

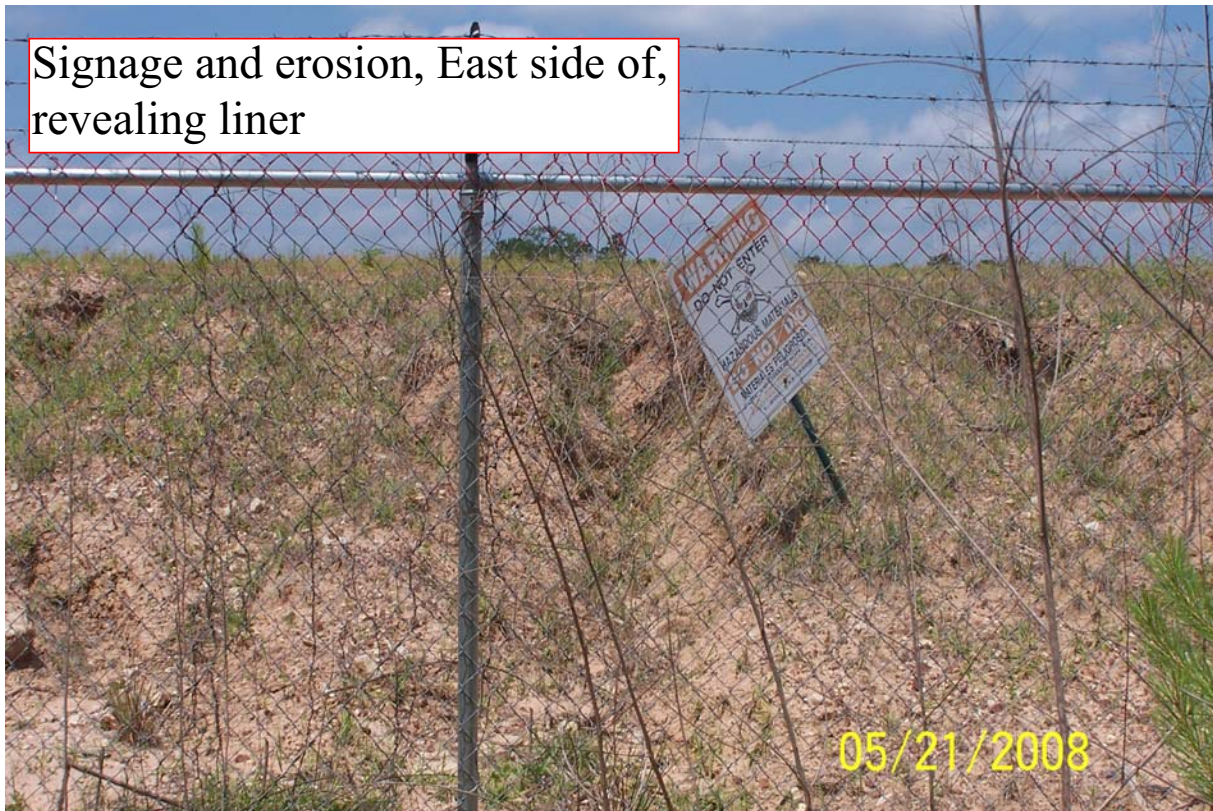
05/21/2008



Erosion of Vault, East side  
revealing liner

05/21/2008

Signage and erosion, East side of,  
revealing liner



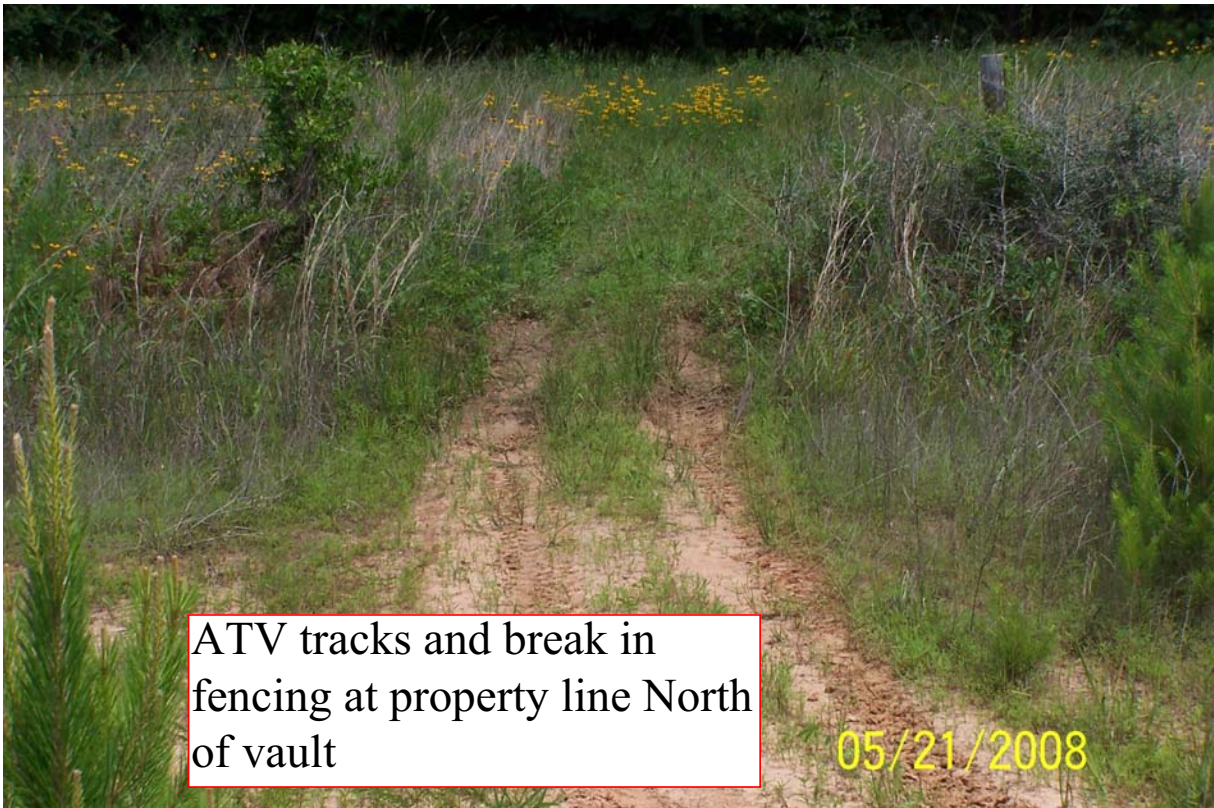
Erosion causing gaps  
under fence





Erosion exposing liner

05/21/2008



ATV tracks and break in  
fencing at property line North  
of vault

05/21/2008







Erosion along West side looking south,  
note depth of trench (waist deep)

05/21/2008



Leachate Southwest corner near gate

05/21/2008



Drums near leachate ports 05/21/2008



Drainage channel Southwest corner of vault

05/21/2008





Wetland area just Southwest of Vault 05/21/2008



Wells 2A and 2B from West 05/21/2008



Lumber piled near west edge

05/21/2008



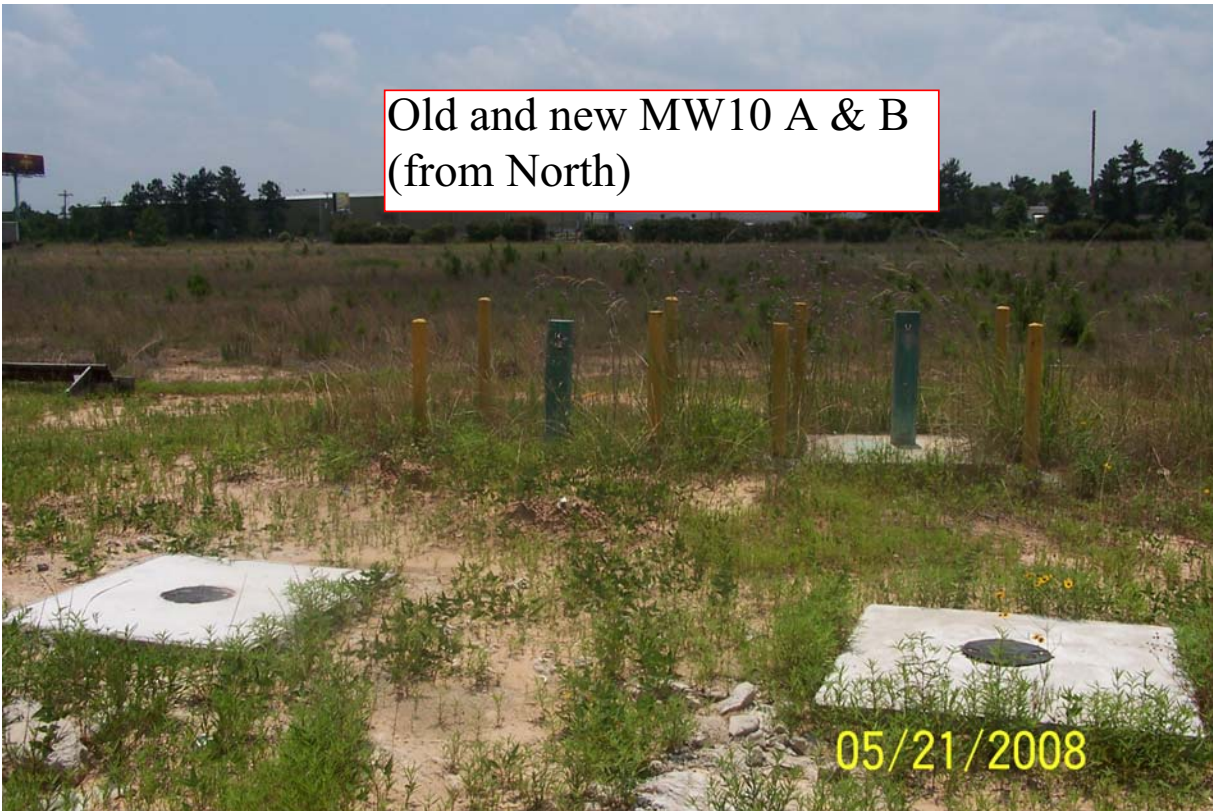
Wood "wall" south of MW 1A & B

05/21/2008



Erosion control near creek  
West/Southwest side of gate

05/21/2008



Old and new MW10 A & B  
(from North)

05/21/2008

**Attachment 5**

**Notice to the Public Regarding the**

**Five-Year Review**

**Conroe Creosoting Company, Superfund Site  
PUBLIC NOTICE  
U.S. EPA Region 6 Begins First Five-Year Review of Site Remedy  
May 2008**



The U.S. Environmental Protection Agency Region 6 (EPA) has begun the First Five-Year Review of the remedy for the Conroe Creosoting Company, Superfund Site in Conroe, Montgomery County, Texas. The Review will determine whether the remedy at the site remains protective of public health and the environment. The remedy, which EPA selected in 2003, calls for natural attenuation of the hazardous substances in the ground water and long-term maintenance of a RCRA vault constructed on-site to contain excavated, contaminated soils and sediments. The site was a wood treating facility for railroad cross-ties, poles, fence posts, and other lumber products. Facility operations resulted in contamination of soil and ground water by creosote and other wood preserving compounds. The site encompasses approximately 147 acres and is located at 1776 East Davis in Conroe, Texas.

The five-year review is scheduled for completion in September 2008. Once completed, the results of the Five-Year Review will be made available to the public at the following Information Repository:

**Montgomery County Memorial Library  
104 I-45 North  
Conroe, Texas 77301**

Information about the Conroe Creosoting Company, Superfund Site is also available on the Internet at <http://www.epa.gov/region6/6sf/6sf.htm>. Questions concerning the Conroe Creosoting Company, Superfund Site, should be directed to Gary Baumgarten at 1-800-533-3508 (toll free) or (214) 665-6749 or by e-mail at [Baumgarten.Gary@epa.gov](mailto:Baumgarten.Gary@epa.gov).