

SECOND FIVE-YEAR REVIEW REPORT

FOR THE

**PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE
ABBEVILLE, VERMILION PARISH, LOUISIANA**

July 2007



PREPARED BY:

**United States Environmental Protection Agency
Region 6
Dallas, Texas**

SECOND FIVE-YEAR REVIEW REPORT
PAB Oil and Chemical Services, Inc. Superfund Site
EPA ID No. LAD980749139
Abbeville, Vermilion Parish, Louisiana

This memorandum documents the United States Environmental Protection Agency's (EPA's) performance, determinations, and approval of the PAB Oil and Chemical Services, Inc. (PAB) Superfund site second five-year review under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code Section 9621(c), as provided in the attached Second Five-Year Review Report prepared by EA Engineering, Science, and Technology, Inc. on behalf of EPA.

Summary of Second Five-Year Review Findings

The second five-year review for the PAB site was performed through a review of site documents and site-specific requirements; a site inspection performed on March 28, 2007; interviews with personnel from the Louisiana Department of Environmental Quality (LDEQ), Project Navigator Ltd. (PAB Group LLC contractor), Aquaterra (Project Navigator subcontractor); and a review of data collected at the site during the second five-year review period.

The site remedy was implemented to prevent direct contact, ingestion, and migration of the disposal pit sludge and associated soil; (2) prevent direct contact with surface waters; and (3) prevent the potential for human exposure to contaminated groundwater. The second five-year review found that the selected remedy is performing as intended, and is currently protective of human health and the environment. The remedy should remain protective in the long term provided the issues and resulting recommendations provided herein are addressed.

Actions Recommended


The main deficiency noted during the site inspection was the lack of institutional controls to restrict future site activities that could jeopardize the site's cap, and to restrict residential development and groundwater use at the site. MW-5 should also be reinstated into the groundwater sampling program and data collected from this well should be used to monitor the long-term protectiveness of the remedy in place. A statistical analysis of groundwater analytical data should also be performed to assure that there has not been deterioration of groundwater quality with time. An analytical laboratory capable of providing method detection limits at (or below) maximum contamination levels (MCLs) should continue to be used for analyses of future groundwater samples collected from the site. Initial analyses of groundwater samples for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) may be more cost-effective than using total organic carbon (TOC) analyses as a substitute, especially if a trend develops where the wells have to be re-sampled for VOCs and SVOCs on a regular basis.

Repairs to the barbed-wire fence surrounding the site, and hanging no trespassing signs along the property perimeters would help to limit trespassing by foot onto the property. Actions should be taken to eliminate conditions favorable for burrowing animals to burrow under the concrete monitoring well pads, and/or possibly into the site's cap. Several low areas located within the confines of the former saltwater pond may require maintenance to prevent ponding of water. Vegetation should be maintained on a regular basis per the site's operation and maintenance (O&M) schedule. This would help reduce favorable habitat for the aforementioned burrowing animals, as well as other biological hazards (e.g., snakes, biting/stinging insects, etc.) that might be encountered by field crews. O&M and groundwater sampling

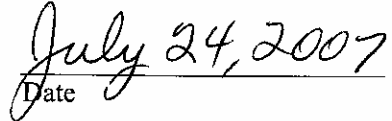
events should continue to be performed on a routine basis per the site's O&M schedule to maintain the condition of the site, and monitor any continued changes in groundwater quality associated with the site.

Determinations

I have determined that the remedy for PAB Oil and Chemical Services, Inc. Superfund site is protective of human health and the environment and that current human exposure is controlled and is thus protective, and will remain so provided the action items herein are addressed and corrective actions implemented.



Samuel Coleman, P.E.
Director
Superfund Division, Region 6
U.S. Environmental Protection Agency



Date

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SECOND FIVE-YEAR REVIEW REPORT
PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE
EPA ID# LAD980749139



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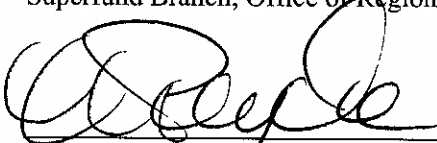
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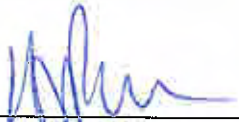
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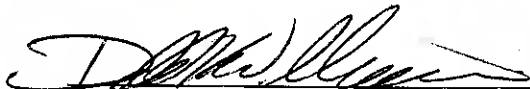
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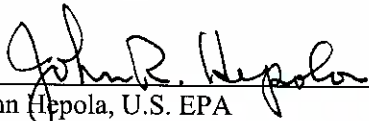
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LIST OF ACRONYMS

AOC	Administrative Order on Consent
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BRA	Baseline Risk Assessment
CFR	Code of Federal Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CWA	Clean Water Act
EA	EA Engineering, Science, and Technology, Inc.
EPA	U.S. Environmental Protection Agency Region 6
ESD	Explanation of Significant Differences
FS	feasibility study
GCAL	Gulf Coast Analytical Laboratory
IC	institutional control
LDEQ	Louisiana Department of Environmental Quality
MCL	Maximum Contaminant Level
µg/L	microgram per liter
mg/L	milligram per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
OU	operable unit
P&A	plug and abandon
PAB	PAB Oil and Chemical Services, Inc.
PAB Group	PAB Remediation Group, L.L.C.
PAH	polycyclic aromatic hydrocarbon
ppm	part per million
PRP	potentially responsible party
RA	remedial action
RAO	remedial action objective
RD	remedial design
RECAP	Risk Evaluation/Corrective Action Program
RI	remedial investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SPL	Southern Petroleum Laboratories
SVOC	semivolatile organic compound
TOC	total organic carbon
UAO	Unilateral Administrative Order
VOC	volatile organic compound
yd ³	cubic yard

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency Region 6 (EPA) has conducted the second five-year review of the remedial action (RA) implemented at the PAB Oil and Chemical Services, Inc. (PAB) Superfund site in Abbeville, Vermilion Parish, Louisiana. The purpose of this second five-year review was to determine whether the selected remedy for the site continues to protect human health and the environment. This review was conducted from January to May 2007, and its findings and conclusions are documented in this report. The first five-year review of the RA was signed on July 26, 2002, establishing the second five-year review period of July 27, 2002, to July 26, 2007.

Documents were reviewed as part of this second five-year review, including (but not limited to) those containing the following data: (1) groundwater sampling summaries, (2) monitoring well water levels, (3) analytical sampling results, and (4) inspection summaries. The RA objectives, selected remedy, and implementation status of the selected remedy are discussed in the following paragraphs.

The site was placed on the National Priorities List on March 31, 1989. Following a remedial investigation and feasibility study, EPA signed a Record of Decision (ROD) on September 22, 1993. The selected remedy included surface water treatment, excavation, biological treatment, residual solidification/stabilization, onsite disposal, a clay cover, and groundwater monitoring. Improved analytical techniques used during pre-design investigation activities, which took place in 1993 and 1995, demonstrated biological treatment of soil and sludge would not be required, and therefore, deemed unnecessary. Apart from this, all aspects of the selected remedy remained the same. This change to the remedy was documented in the Explanation of Significant Differences (ESD) that was signed by EPA on March 12, 1997.

Due to the disposal of treated soil and sludge in an onsite disposal unit, operation and maintenance (O&M) at the site includes groundwater monitoring and maintenance of the disposal cell, disposal cell cap, and associated drainage ditches. Additionally, the PAB Remediation Group LLC (PAB Group) is responsible for inspecting the condition of the road and site fencing and making repairs, as necessary.

The PAB Group conducted the RA with EPA oversight. The RA began in June 1997 with the site mobilization and ended in August 1998 following the completion of capping, grading, and re-vegetation.

The RA completed at this site included: (1) dewatering and backfilling of the pond, which involved treatment and discharge of approximately 6 million gallons of water; (2) removal of the top 6 inches of the entire saltwater pond bottom and incorporation of this material into the soil/sludge treated by solidification/stabilization in the pit area; (3) solidification/stabilization of approximately 7,000 cubic yards of soil/sludge; and (4) backfilling, grading, and re-vegetation with grass seed.

The RA was successfully implemented in order to meet the remedial action objectives (RAOs) documented in the ROD. The site RAOs are intended to: (1) prevent direct contact, ingestion, and migration of the disposal pit sludge and associated soil; (2) prevent direct contact with surface waters; and (3) prevent the potential for human exposure to contaminated groundwater.

The second five-year review focused on data obtained during routine inspections and sampling events conducted at the PAB site during the second five-year review period. At this time, the selected remedy appears to be performing in an overall protective manner as intended, with the following issues noted:

1. **Monitoring Well/Site O&M**—The site inspection indicated burrowing animals have burrowed under the concrete well pads associated with monitoring wells MW-3 and MW-8. Additionally, it appears that a tree with a trunk approximately 5 inches in diameter was allowed to grow adjacent to the MW-8 well pad, but had been recently cut and removed prior to the second five-year review inspection. These conditions could cause localized shifting of the ground surface, and could jeopardize the integrity of these wells. Additionally, these wells are situated in close proximity to the site's cap, and steps should be taken to prevent burrowing animals from inhabiting this portion of the site. The Louisiana Department of Environmental Quality (LDEQ) also noted in their survey response that site vegetation needed to be mowed, and several low areas associated with the former saltwater pond needed to be dressed and/or backfilled.
2. **Sampling of Monitoring Well Network**—Localized groundwater flow beneath the site appears to be to the northwest. MW-5 is situated downgradient of the former tank battery and the capped disposal pits. Groundwater samples were collected from MW-5 and analyzed from January 2001 through August 2003, and during this time period, contaminants of concern (COCs) were either below method detection limits and/or applicable MCLs. Consequently, this well was removed from the groundwater monitoring program in late 2003. Periodic groundwater quality data from this well would help monitor the long-term effectiveness of the RA.
3. **Institutional Controls (ICs)**—The implementation of ICs was recommended during the previous five-year review in order to restrict residential use of the site, prevent future drilling/excavation activities that could jeopardize the integrity of the site's cap, and to restrict groundwater use at the site. This second five-year review indicated that the previously recommended conveyance notice (i.e., deed notice) had never been implemented for the site.
4. **Perimeter Fence O&M**—Breaches in the fence surrounding the site were noted during the previous five-year review. The March 2007 site inspection indicated the fencing surrounding the site is a barbed-wire fence. Breaches continued to be noted along the north and south segments of this perimeter fencing during the March 2007 site inspection.

5. **Analyte Detection Limits**—During the previous five-year review, it was noted that laboratory detection limits exceeded MCLs for a few of the analyzed metals. Review of groundwater quality data collected during the current five-year-review period indicates that the laboratory method detection limits reported by Gulf Coast Analytical Services (GCAL) were consistently higher than the respective MCL for beryllium, antimony, and thallium during the September 2002 through March 2006 groundwater monitoring events. Southern Petroleum Laboratories (SPL) was used to analyze groundwater samples collected during the 2007 annual groundwater monitoring event, and laboratory detection limits for all metals were at/below their respective MCLs for the analyzed groundwater samples.
6. **Statistical Analysis of Groundwater Data**—Statistical analysis of groundwater data was recommended during the previous five-year review. Based on a review of the data provided for the current five-year review, statistical analysis of this data has not been performed. Additionally, EPA and LDEQ approved a reduction of groundwater sampling and analysis activities to an annual basis in December 2003. Since that time, the reports generated for the annual groundwater monitoring and sampling events include tables that only present results for that particular sampling event, versus cumulative analytical data that would give a better indication of groundwater quality trends with time on a well by well basis.
7. **Use of Total Organic Carbon (TOC) Analysis in lieu of Volatile Organic Compound (VOC) and Semivolatile Organic Compound (SVOC) Analyses**—As indicated within Issue 6 above, in December 2003, EPA and LDEQ approved the reduction in O&M activities for the site. This approved reduction included reducing the number of wells sampled to MW-2, MW-6, MW-8, and MW-9 on an annual basis, with groundwater samples collected from these wells being analyzed for metals and TOC. If TOC concentrations were detected, then the EPA would be consulted, and the affected well(s) and downgradient well(s) would be re-sampled and groundwater samples would be analyzed for VOCs and SVOCs. TOC detections occurred during the 2004 and 2006 annual groundwater monitoring events. However, no data was provided which indicates these wells were re-sampled for VOC or SVOC analyses during these two groundwater monitoring events. TOC concentrations were also detected during the 2007 annual monitoring event, and monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9 were sampled/re-sampled for VOCs and SVOCs. Bis(2-ethylhexyl)phthalate was the only SVOC detected, at a concentration of 7.4 micrograms per liter ($\mu\text{g/L}$), in MW-7. All other VOC and SVOC concentrations were below laboratory method detection limits for the remaining wells.

The following actions are recommended in response to these issues:

1. Take necessary steps to eliminate favorable conditions for burrowing animals in the vicinity of the monitoring wells and site cap. Eliminate the excess growth of trees and other vegetation around the wells, and across the site, per the agreed semiannual O&M schedule. Routine management of the site's vegetation may also help reduce habitat for the burrowing animals and other biological hazards, such as snakes and stinging insects. Backfill and dress low areas associated with the former saltwater pond in order to reduce ponding of surface water during heavy rain conditions.
2. Although MW-5 has historically displayed site COCs that were either below laboratory method detection limits and/or applicable MCLs, the reinstatement of MW-5 into the groundwater sampling program for periodic sampling would help monitor the long-term protectiveness of the RA.

3. Complete and file deed notice with Vermilion Parish to restrict residential use of the property, groundwater use at the site, and excavation/boring activities that could jeopardize the site's cap.
4. Repair the perimeter fencing and post the property perimeter with warning signs.
5. Continue use of an analytical laboratory that is capable of providing laboratory detection limits at (or below) the respective MCL for each analyte.
6. Perform a statistical analysis of groundwater quality data to ensure groundwater quality is not degrading with time. Prepare a cumulative groundwater quality data table for metal results and update/present this table during each of the annual groundwater reporting events. This will assist in monitoring changes in groundwater quality with time at the site, and can also be used to graphically present any of these changes.
7. Review of groundwater quality data collected since the reduction of O&M activities (approved December 2003) indicates TOC has been detected in collected groundwater samples during three of the four annual monitoring and sampling (M&S) events. A trend may be developing where utilization of the reduced VOC/SVOC analyses protocol (i.e., TOC only) may actually cost more for O&M activities than sampling and analyzing the wells for all site COCs as part of each initial groundwater sampling event. This additional cost is associated with the need to re-mobilize field crews and additional time to re-sample the wells (and downgradient wells) versus the cost for the VOC and SVOC analyses. Because of this situation, sampling and initial analyses of groundwater samples for all site COCs (metals, VOCs, and SVOCs) is recommended.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name (from WasteLAN): PAB Oil and Chemical Services, Inc. Superfund Site

EPA ID (from WasteLAN): LAD980749139

Region: 6

State: Louisiana

City/County: Abbeville/Vermilion Parish

SITE STATUS

NPL Status: Final Deleted Other (specify) _____

Remediation Status (choose all that apply): Under Construction Operating
 Complete

Multiple OUs?* YES NO

Construction Completion Date: August 1998

Has site been put into reuse? YES NO

REVIEW STATUS

Reviewing Agency: EPA State Tribe Other Federal Agency _____

Author Name: Michael Hebert

Author Title: Remedial Project Manager

Author Affiliation: EPA Region 6

Review Period:** 07/2002 to 06/2007

Date(s) of Site Inspection: 3/28/2007

Type of Review: Statutory
 Policy Post-SARA Pre-SARA NPL-Removal only
 Non-NPL Remedial Action Site NPL State/Tribe-lead
 Regional Discretion

Review Number: 1 (first) 2 (second) 3 (third) Other (specify) _____

Triggering Action:

Actual RA Onsite Construction at OU Actual RA Start
 Construction Completion Previous Five-Year Review Report
 Other (specify) _____

Triggering Action Date (from WasteLAN): 07/26/2002

Due Date (Five Years After Triggering Action Date): 07/26/2007

* "OU" refers to operable unit.

** The review period refers to the period during which the five-year review was conducted.

Five-Year Review Summary Form (Continued)

Issues:

1. **Monitoring well/Site O&M**—The site inspection documented animal burrows under the MW-3 and MW-8 wells pads, and prior tree growth near the MW-8 well pad, which could jeopardize the integrity of these wells. LDEQ also noted in their survey response that site vegetation needed to be mowed, and several low areas associated with the former saltwater pond needed to be dressed and/or backfilled.
2. **Sampling of Monitoring Well Network**—Localized groundwater flow beneath the site appears to be to the northwest. MW-5 is situated downgradient of the former tank battery and the capped disposal pits. This well was dropped from the groundwater monitoring program in late 2003.
3. **Institutional Controls (ICs)**—The implementation of ICs in the form of conveyance notice (i.e., deed notice) was recommended during the previous five-year review. This second five-year review indicated that the previously recommended ICs have never been implemented for the site.
4. **Perimeter Fence O&M**—Breaches in the fence surrounding the PAB site were noted during the previous five-year review. Breaches continued to be noted along the north and south segments of this perimeter fencing during the March 2007 site inspection. These breaches create a situation where trespassers on foot can access the site from the nearby north and south properties, which are developed, or under development, with single-family residences.
5. **Analyte Detection Limits**—Laboratory detection limits above MCLs were noted during the previous five-year review. Method detection limits for beryllium, antimony, and thallium continued to be higher than their respective MCLs during the September 2002 through March 2006 groundwater monitoring events. Use of a different laboratory during the March 2007 reporting period resulted in laboratory detection limits that were at (or below) their respective MCLs.
6. **Statistical Analysis of Groundwater Data**— Statistical analysis of groundwater data was recommended during the previous five-year review. Based on a review of the data provided for the current five-year review, a statistical analysis of this data has not been performed.
7. **Use of TOC Analysis in lieu of VOC and SVOC Analyses**—A reduction in O&M activities was approved by EPA and LDEQ in December 2003. The approved reduction included the substitution of TOC analysis for VOC and SVOC analyses, with the contingency that site wells would be re-sampled and the collected samples analyzed for VOCs and SVOCs, if warranted. TOC detections occurred during the 2004 and 2006 annual groundwater monitoring events, but there is no indication that the wells were re-sampled for VOC or SVOC analyses. TOC concentrations were also detected during the 2007 annual monitoring event; an additional groundwater sampling event was conducted, and the samples were analyzed for VOCs and SVOCs. Bis(2-ethylhexyl)phthalate was the only SVOC detected, at a concentration of 7.4 µg/L, in MW-7. All other VOC and SVOC concentrations were below laboratory detection limits.

Five-Year Review Summary Form (Continued)

Recommendations and Follow-up Actions:

1. Eliminate conditions favorable for burrowing animals in the vicinity of the monitoring wells and the site cap. Eliminate the excess tree growth and other vegetation around the wells, and across the site, per the agreed semiannual O&M schedule. Backfill and dress low areas associated with the former saltwater pond in order to reduce ponding of surface water during heavy rain conditions.
2. The reinstatement of MW-5 into the groundwater sampling program would help monitor the long-term protectiveness of the RA.
3. Complete and file a deed notice with Vermilion Parish to restrict residential use of the property, groundwater use at the site, and excavation/boring activities that could jeopardize the site's cap.
4. Repair the perimeter fencing and post the property perimeter with warning signs.
5. Continue use of an analytical laboratory that is capable of providing laboratory detection limits at/below the respective MCL for each analyte.
6. Perform statistical analysis of groundwater quality data to ensure groundwater quality is not degrading with time. Prepare a cumulative groundwater quality data table for metal results and update/present this table during each of the annual groundwater reporting events. This will assist in monitoring changes in groundwater quality with time at the site, and can also be used to graphically present any of these changes.
7. A trend may be developing where utilization of the reduced VOC/SVOC analyses protocol (i.e., TOC only) may cost more for O&M activities than sampling and analyzing the wells for all site COCs as part of the initial groundwater sampling event. Sampling and initial analyses of groundwater samples for all site COCs (e.g., metals, VOCs, and SVOCs) is recommended.

Protectiveness Statement:

Based on available information during the second five-year review, the selected remedy for the PAB Oil and Chemical Services, Inc. Superfund site appears to be currently protective of human health and the environment. The selected remedy will continue to remain protective, provided the action items herein are addressed and implemented.

Long-Term Protectiveness:

The second five-year review found that the selected remedy is performing as intended, and is protective of human health and the environment. The remedy will be protective in the long term provided the action items herein are addressed and implemented.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 6 has conducted a second five-year review of the remedial action (RA) implemented at the PAB Oil and Chemical Services, Inc. (PAB) Superfund site, located in Abbeville, Vermilion Parish, Louisiana, for the period between the completion of the first five-year review in July 2002 through June 2007. The purpose of a five-year review is to determine whether the remedy at the site remains protective of human health and the environment, and to document the methods, findings, and conclusions of the five-year review in a Five-Year Review Report. Five-Year Review Reports identify issues found during the review, if any, and make recommendations to address the issues. This Second Five-Year Review Report documents the results of the review for the PAB site, which was conducted in accordance with EPA guidance on five-year reviews.

The five-year review process is required by federal statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), as amended, states the following:

“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 the following:

“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.

Because hazardous substances, pollutants, or contaminants remain at the PAB site above levels that allow for unlimited use and unrestricted exposure, a five-year review is required.

The PAB site includes one operable unit (OU), which addressed contaminated surface water, groundwater, soil, and sludge. This second five-year review addresses the remedy for this OU. The period addressed by the second five-year review for the PAB site extended from July 27, 2002, to June 1, 2007. The triggering action for this review was the completion of the first five-year review in July 2002. The second five-year review was conducted from January 2007 through May 2007, and its methods, findings, conclusions, and recommendations are documented in this report.

This report documents the five-year review for the PAB site by providing the following information: site chronology (Section 2.0), background information (Section 3.0), an overview of the RAs (Section 4.0), progress since the first five-year review (Section 5.0), the five-year review process (Section 6.0), technical assessment of the site (Section 7.0), institutional controls (ICs) (Section 8.0), issues (Section 9.0), recommendations and follow-up activities (Section 10.0), protectiveness statement (Section 11.0), and discussion of the next review (Section 12.0). Attachment 1 is an aerial photograph illustrating the site location. Attachment 2 is a Site Layout Map that illustrates the existing monitoring well locations in reference to historical features that were in use while PAB Oil and Chemical Services, Inc. was in operation. Attachment 3 provides a list of documents reviewed. Attachment 4 provides cumulative metal concentrations for groundwater. Attachment 5 provides the site inspection checklist. Attachment 6 provides the interview records with the completed site survey forms. Attachment 7 provides site inspection photographs.

2.0 SITE CHRONOLOGY

A chronology of events for the PAB site is provided in Table 1. Additional historical information for the site is available online at: <http://www.epa.gov/docs/earth1r6/6sf/pdffiles/0600576.pdf>.

TABLE 1
CHRONOLOGY OF SITE EVENTS
PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE

Date	Event
July 1980	Site discovery
October 1987 to April 1988	Performed search for potentially responsible parties (PRPs) but none identified
March 1989	Site was listed on the NPL
July 1989	Federally financed removal assessment
November 1989 to September 1990	Continued search for responsible parties and identified PRPs
March 1992 to January 1993	Treatability study
January 1993	Human health risk assessment
January 1993	Ecological risk assessment
June 1990 to September 1993	Combined remedial investigation/feasibility study (RI/FS)
October 1992 to December 1993	Conducted search to update PRP list
September 1991	PRP financed removal assessment
October 1991 to February 1992	PRP removal
September 22, 1993	Record of Decision
September 1993 to September 1995	PRP financed removal assessment
March 12, 1997	Explanation of Significant Differences
February 1997 to March 1997	Consent Decree
November 1994 to May 1997	PRP remedial design
June 1997 to August 1998	PRP RA
August 1999 to January 2000	Deletion from NPL
October 23, 1998	Fourth quarter 1998 inspection
January 26-27, 1999	1 st quarter 1999 inspection and monitoring

TABLE 1
CHRONOLOGY OF SITE EVENTS
PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE

Date	Event
April 19, 1999	2 nd quarter 1999 inspection
July 20-21, 1999	3 rd quarter 1999 inspection and monitoring
October 18, 1999	4 th quarter 1999 inspection
January 19, 2000	1 st quarter 2000 inspection and monitoring
April 20, 2000	2 nd quarter 2000 inspection
July 18, 2000	3 rd quarter 2000 inspection and monitoring
October 18, 2000	4 th quarter 2000 inspection
January 14, 2001	1 st quarter 2001 inspection and monitoring
April 17, 2001	2 nd quarter 2001 inspection
July 31, 2001	3 rd quarter 2001 inspection and monitoring
December 20, 2001	4 th quarter 2001 inspection
February 20, 2002	1 st quarter 2002 inspection and monitoring
February 21, 2002	Site inspection for first five-year review
June 19, 2002	2 nd quarter 2002 inspection
June 24, 2002	Louisiana Department of Environmental Quality (LDEQ) comments to First Five-year Review Report
July 26, 2002	First Five-year Review Report finalized
September 19, 2002	3 rd quarter 2002 inspection and monitoring
December 17, 2002	4 th quarter 2001 inspection
March 17-18, 2003	1 st quarter 2003 inspection and monitoring
June 12, 2003	2 nd quarter 2003 inspection
August 19-20, 2003	3 rd quarter 2003 inspection and monitoring

TABLE 1
CHRONOLOGY OF SITE EVENTS
PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE

Date	Event
August 27, 2003	Initial Project Navigator request for operation and maintenance (O&M) reduction
September 10, 2003	LDEQ site Inspection
October 20, 2003	Revised Project Navigator request for O&M reduction
December 1, 2003	LDEQ approval of reduced O&M
December 8, 2003	EPA approval of reduced O&M
December 17, 2003	4 th quarter 2003 inspection
January 22, 2004	Project Navigator work plan to plug and abandon (P&A) MW-10, MW-11, and MW-12
February 19, 2004	LDEQ approval to P&A MW-10, MW-11, and MW-12
February 24, 2004	EPA approval to P&A MW-10, MW-11, and MW-12
March 23-24, 2004	Annual inspection and monitoring per reduced O&M schedule; MW-10, MW-11, and MW-12 P&A; LDEQ site inspection
August 19, 2004	LDEQ site inspection
March 7, 2005	LDEQ site inspection
March 8, 2005	Annual inspection and monitoring per reduced O&M schedule
March 31, 2006	Annual inspection and monitoring per reduced O&M schedule
May 10, 2006	LDEQ site inspection
March 1, 2007	Annual inspection and monitoring per reduced O&M schedule
March 16, 2007	Supplemental groundwater sampling event due to total organic carbon detections in groundwater
March 28, 2007	Site inspection for second five-year review

3.0 BACKGROUND

This section discusses the site's physical characteristics, land and resource use near the site, history of site contamination, initial response to the site, and the basis for the response.

3.1 PHYSICAL CHARACTERISTICS

The PAB site covers approximately 16.7 acres in Vermilion Parish, Louisiana, near the southwestern portion of the State. It is located approximately 3 miles north of the town of Abbeville (population 13,000), adjacent to Route 167, which connects Abbeville with Lafayette, Louisiana, located about 21 miles north. Attachment 1 contains a Site Location Map for the PAB site.

The PAB site and surrounding area are flat and have a general surface elevation approximately 20 feet above mean sea level. The site is located within the unconsolidated sediments of the Atlantic-Gulf Coastal Plain physiographic province. There are three subsurface stratigraphic units: an upper clay unit ranging from 0 to 2 feet below ground surface (bgs), a middle clay/silt/sand unit extending from 19 to 23 feet bgs, and a lower sand/gravel unit extending to depths of at least 110 feet bgs. Groundwater beneath the site was encountered at approximately 30 feet bgs in the upper Chicot Aquifer System, Abbeville Unit. The groundwater flow direction under the site was found to be generally west-northwest with a gradient of 0.0002 foot per foot.

3.2 LAND AND RESOURCE USE

Historical land use is unknown prior to the establishment of oil field drilling mud and saltwater disposal operations in the late 1970s. The primary land use near the PAB site is agricultural and residential (Attachment 1). There is currently no significant change in future land use projected for the site; however, the March 28, 2007, five-year review site inspection indicated that increased residential development has occurred immediately south of the site since the prior five-year review. Additionally, at the time of the five-year review site inspection, the adjacent north property was under development by the Vermilion Chateau Subdivision, which will contain single family residences. Three city wells in Abbeville provide drinking water to approximately 18,000 people. Private wells within 3 miles of the site serve an additional 2,100 people. A representative of Keller Williams (real estate agent for the adjacent Vermilion Chateau Subdivision under development) indicated public water would be supplied to the subdivision by Vermilion Parish Water District 1.

3.3 HISTORY OF CONTAMINATION

Attachment 2 contains a Site Layout Map that illustrates the location of historic features formerly utilized by PAB Oil and Chemical Services, Inc. while it was in operation. From 1978 to approximately 1983, the site was operated as a disposal facility for oil field drilling mud and saltwater under State interim approval. The waste oil skimmed from the oil-based drilling mud separation/disposal pits, that were located in the northeast part of the site was sold to re-claimers. In 1980, the State passed an amendment which established new requirements for offsite drilling mud and saltwater disposal facilities. The PAB site was granted temporary authority to operate with 90 days to comply with the new requirements. Investigations triggered by a citizens' complaint of illegal discharges determined the majority of the onsite contamination was a direct result of the drilling mud and fluids, produced water, work-over fluids, and tank bottoms the facility received from oil and gas exploration and production.

Per the September 1993 Record of Decision (ROD), other contamination was attributed to pesticides from local agricultural uses and naturally occurring contamination, such as arsenic in the groundwater.

3.4 INITIAL RESPONSE

In 1984, 1985, and 1987, EPA conducted site investigations. Concern for the potential to contaminate the underlying Chicot Aquifer, a drinking water source, was the primary reason the PAB site was proposed for the NPL on June 24, 1988. The final listing date for the PAB site on the NPL was March 31, 1989. In 1991, it was discovered that an immediate threat was posed by ignitable waste contained in one of four onsite storage tanks that was structurally damaged. In 1992, a removal action was implemented by the PAB Remediation Group, L.L.C. (PAB Group) under an Administrative Order on Consent (AOC) with EPA. The removal action included relocation of waste from the four storage tanks, dismantling the tanks, and treatment and disposal of the waste off site.

EPA conducted a remedial investigation (RI) and feasibility study (FS) between January 1991 and March 1993. All of the contaminants found at the site were related to drilling muds, drilling fluids, produced water, and other associated wastes such as work over fluids and tank bottoms. Contaminants detected in the pit soil/sludge, pond sediment, and surface water included petroleum hydrocarbons such as ethylbenzene, fluorine, methylnaphthalene, phenanthrene, toluene, and xylene; and heavy metals such as arsenic, barium, chromium, copper, lead, and zinc.

In January 1993, a Baseline Risk Assessment (BRA) was completed for the site, and was used to establish the following remedial action objectives (RAOs) for clean up of soil, sludge, and sediment at the site:

- Arsenic – less than 10 parts per million (ppm)
- Barium – less than 5,400 ppm
- Carcinogenic Polynuclear Hydrocarbons (cPAHs) – less than 3 ppm as benzo(a)pyrene equivalent
- Polynuclear Hydrocarbons (PAHs) – less than or equal to 1 Hazard Index

Following completion of the RI, FS, and BRA, EPA signed a ROD on September 22, 1993. As discussed further in Section 4.1 of this document, the selected remedy called for surface water treatment, excavation, biological treatment, residuals solidification/stabilization, onsite disposal, a clay cover, and groundwater monitoring with an estimated cleanup cost of over \$12,000,000, and annual operation and maintenance (O&M) costs of approximately \$86,000.

As also discussed further in Section 4.1 of this document, on March 12, 1997, an Explanation of Significant Differences was issued that modified the selected remedy. This modification occurred after improved laboratory procedures (revised in 1993) were able to achieve cPAH and PAH method detection limits that were below the RAOs established for the Site. Subsequent soil, sludge, and sediment samples collected during the 1993 and 1995 pre-design investigation activities were analyzed utilizing these revised laboratory methods. Analytical results for the 1993 and 1995 soil, sludge and sediment samples displayed cPAH and PAH concentrations that were below the site RAOs. Therefore, only the soil, sludge, and sediment containing arsenic and barium concentrations exceeding RAOs were addressed per the remedy modification.

3.5 BASIS FOR TAKING ACTION

Sludge, sediment, surface water, and groundwater at the PAB site were contaminated with concentrations of VOCs, SVOCs, and/or metals that, if not addressed by the response action selected in the ROD, presented an imminent and substantial endangerment to public health, welfare, or the environment.

4.0 REMEDIAL ACTIONS

This section discusses the selected remedy, remedy implementation, O&M activities, and O&M costs.

4.1 SELECTED REMEDY

EPA signed the ROD for the PAB site on September 22, 1993. Remedial action objectives (RAOs) were established to aid in the development and screening of RA alternatives for the site. The RAOs for the site are listed below:

- Prevent direct contact, ingestion, and migration of the disposal pit sludge and associated soils
- Prevent direct contact with contaminated surface waters
- Prevent the potential for human exposure to contaminated groundwater.

The selected remedy included surface water treatment, excavation, biological treatment, residuals solidification/stabilization, onsite disposal, a clay cover, and groundwater monitoring. As discussed in Section 3.4 of this document, analytical data obtained in 1993 and 1995 indicated that all carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in the onsite soil and sludge were below the RAO of 3 parts ppm. Biological treatment, therefore, was deemed unnecessary as part of the RA. All aspects of the remedy remained the same, with the exception of biological treatment, resulting in a cost savings of approximately \$4,000,000. This change to the remedy was made and documented in an Explanation of Significant Differences (ESD) signed by EPA on March 12, 1997. The modified remedy is similar to the remedy selected in the 1993 ROD. The components of the modified remedy documented in the ESD were:

- Excavation and onsite solidification/stabilization of onsite soil, sludge, and sediment containing arsenic and barium above RAOs of 10 ppm and 5,400 ppm, respectively. Also, an organophilic clay must be used in the solidification/stabilization mix to chemically stabilize organic compounds contained in the waste.
- Disposal of treated residuals in an onsite disposal unit
- Placement of a compacted clay cover over the disposal unit
- Removal and onsite treatment of all surface water with final discharge to site drainage ditches
- Long-term groundwater monitoring
- Long-term site O&M

4.2 REMEDY IMPLEMENTATION

On September 27, 1994, EPA issued a Unilateral Administrative Order (UAO) to a number of potentially responsible parties (PRPs) directing them to perform the remedial design (RD) and RA. The PAB Group conducted the RA with EPA oversight under the UAO Docket No. CERCLA 6-18-94. The RA began in June 1997 with mobilization to the site, and ended in August 1998 with the completion of landfill capping, grading, and re-vegetation. The RA completed at the site included the following major work elements. Dewatering and backfilling of the pond identified in the ROD began soon after site mobilization. Approximately 6 million gallons of water were removed from the saltwater pond; all of the water was treated in an electro-precipitation unit and tested for the discharge standards prior to being discharged into a drainage ditch that leads to the drainage system along Highway 167. Discharge limits were established by LDEQ and documented in a memorandum from the PAB Group, which was approved by EPA on April 30, 1997.

The saltwater pond bottom sediment was sampled and analyzed for total arsenic, barium, and PAHs. Some of the samples exceeded the RAOs of 5,400 ppm for barium and 10 ppm for arsenic. Therefore, the top 6 inches of the entire saltwater pond bottom was removed and incorporated into the soil/sludge that was being treated by solidification/stabilization in the pit area. Approximately 7,000 cubic yards (yd³) of this material were treated. The entire area was then brought to grade with clean backfill and re-vegetated with grass seed.

The major component of the remedy was to stabilize/solidify the sludge pit material. The contaminated soil and sludge containing arsenic and barium exceeding RAOs was combined with reagent materials, including cement, ferrous sulfate, and organophilic clay, in order to achieve the performance standards. The performance standards included an unconfined compressive strength exceeding 50 pounds per square inch and toxicity characteristic leaching procedure values for arsenic and barium of less than 0.05 ppm and 2.0 ppm, respectively. The sludge/soil treatment performance standards are documented in a memorandum from the PAB Group that was approved by EPA on May 15, 1997. Once the treated material was tested and found to meet these standards, it was placed back into the area where the three pits were consolidated for final disposal. Before placement of any material into the consolidated pit area, the bottom of this structure was sampled and found to be free of contamination. Approximately 25,000 yd³ of material was treated in this manner. Once the three pits were filled with the treated material, all the pits were brought up to grade and a low-permeability cap was installed per the approved grading specifications. A topsoil layer was then applied, and the area was re-vegetated with grass seed. All

RAOs identified in the ROD were met by implementation of the remedy. The constructed remedy is operational and performing in accordance with engineering specifications.

4.3 OPERATION AND MAINTENANCE

The ROD and UAO for the RD and RA, after an approved ESD was signed, required the following activities:

- Disposal of treated soil and sludge in an onsite disposal unit
- De-watering and backfilling of the saltwater pond
- Long-term groundwater monitoring

Due to the disposal of treated soil and sludge in an onsite disposal unit, maintenance of the cap and associated drainage ditches is one of the PAB Group's on-going responsibilities. Maintenance and monitoring activities that will sustain the design properties of the cap and monitor migration of contaminants include: (1) re-grading of erosion scars (with or without addition of material), rills, or minor surface slumps in the cover and on the berm slopes; (2) clean out of accumulated sediment and debris in drainage ditches; (3) reseeded of cover, as necessary; (4) inspecting the cover for settlement and re-grade, as necessary; (5) inspecting the cover for damage and repair, as necessary; (6) surveying the cap settlement monuments; and (7) long-term groundwater monitoring for VOCs, SVOCs, and metals. Additionally, the PAB Group will inspect the conditions of the road and site fencing and make necessary repairs.

Monitoring activities, as outlined above, were originally scheduled quarterly for the first year following completion of the RA (August 1998 to July 1999), and semiannually from Years 2 (August 1999) to 5 (July 2004). In December 2003, EPA and LDEQ approved a reduction in O&M activities which included the following:

- Annual inspection and maintenance/repair of the cap, drainage ditches, roadways, and fencing
- Surveying of well monuments for settlement associated with the cap, to occur every two years
- Semiannual mowing of vegetation
- Annual inspection/repair of monitoring wells MW-1 through MW-9
- Annual measurement of static water levels associated with monitoring wells MW-1 through MW-9

- Annual sampling of monitoring wells MW-2, MW-6, MW-8, and MW-9; field measurements of pH, conductivity and temperature will be collected, and samples will be analyzed for metals (SW-846 Method 6010B) and total organic carbon (TOC). If TOC is detected, the impacted well(s) and downgradient well(s) will be sampled in consultation with EPA, and the groundwater samples will be analyzed for VOCs and SVOCs.
- Plugging and abandonment of monitoring wells MW-10, MW-11 and MW-12.

Currently, Aquaterra Engineering is conducting site O&M activities under the supervision of Project Navigator, Ltd. Below is a summary of major milestones that have been conducted during the O&M activities for this five-year review period:

- **O&M Activities**—O&M activities associated with the inspection/maintenance of the cap, drainage ditches, roadways, monument settlement, and mowing of vegetation occurred per the original O&M plan from July 2002 through December 2003, and per the approved reduction in O&M activities from January 2004 through the present.
- **Monitoring well sampling**—Monitoring well sampling occurred on a semiannual basis from 3rd quarter 2002 through 3rd quarter 2003; and on an annual basis from 1st quarter 2004 to the present. The groundwater sampling program was reduced to monitoring and sampling of monitoring wells MW-2, MW-6, MW-8, and MW-9, beginning with the 2004 annual groundwater monitoring and sampling event.
- **Monitoring well plugging and abandonment**—Monitoring wells MW-10, MW-11, and MW-12 were plugged and abandoned on March 23 and 24, 2004.

4.4 OPERATION AND MAINTENANCE COST

Project Navigator, Ltd., on the behalf of PAB Group, was requested to provide annual O&M costs for the second five-year review period. Project Navigator declined the request, and indicated they were not allowed to disclose such financial data for the project. As indicated in the First Five-year Review Report (July 2002), an annual O&M cost of \$86,000 was projected in the ROD, but the annual O&M costs were substantially lower (\$2,600 to \$19,900) during the first five-year review period. This cost reduction was attributed to only five of the 12 monitoring wells being sampled per an earlier approved reduction in O&M activities. Based on this prior cost data and further reduction of O&M activities (as approved in December 2003), an assumption has been made that the annual O&M costs incurred during this second five-year review period have possibly decreased even further, and still remain lower than the O&M cost projected in the ROD.

5.0 PROGRESS SINCE THE FIRST FIVE-YEAR REVIEW

This is the second five-year review for the PAB site. The first five-year review was completed in July 2002. Overall, the site appears to have been properly maintained during the period between reports. The scheduled date for the Third Five-Year Review Report is July 2011. However, the final commitment date is five years from the signature date of this second report.

5.1 PROTECTIVENESS STATEMENT FROM FIRST FIVE-YEAR REVIEW

The First Five-Year Review Report (EPA 2002) concluded the remedy for the Site is currently protective of human health and the environment.

5.2 FIRST FIVE-YEAR REVIEW RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The first five-year review of the PAB site, completed in July 2002, recommended the following follow-up actions:

- Repair of a broken well monument hinge on MW-8
- Repair of damaged areas of fencing surrounding the site
- Maintain consistency for all sampling events to ensure analyte detection limits do not exceed MCLs; the detection limit for arsenic should be reduced to its MCL of 0.01 mg/L
- Perform statistical analysis to verify site groundwater is not degrading
- Revise sample analyses procedures to ensure there is consistency in sample filtration
- PAB Group should file a deed notice with the Vermilion Parish Clerk to prohibit drilling on the site, and other activities that could compromise the integrity of the clay cap

5.3 STATUS OF RECOMMENDED ACTIONS

This section describes the current status of implementation of the recommendations included in the First Five-Year Review Report. Observations made during the March 28, 2007, site inspection indicated that the broken monument hinge associated with MW-8 was repaired, but breaches in the north and south segments of the barbed-wire fence surrounding the site remain.

Review of groundwater analytical data collected for the PAB site during this second five-year review period indicated that the detection limit for arsenic was reduced (as recommended) to 0.01 mg/L during the March 2003 groundwater monitoring and sampling event. However, the laboratory detection limits

for beryllium, antimony, and thallium remained above their respective MCLs through the March 2006 groundwater monitoring and sampling event. An alternate laboratory, Southern Petroleum Laboratories (SPL), was used for groundwater sample analyses during the March 2007 sampling event, and all detection limits were at (or below) their respective MCLs.

Review of the chain-of-custody forms submitted with groundwater samples also indicated that the samples were being collected and shipped for filtering at the laboratory. Mr. Tom Vrenick, Aquaterra Operations Manager, indicated the samples are collected and shipped in unpreserved bottles, and then filtered and preserved by the laboratory prior to analyses.

Review of the provided site data suggests a statistical analysis of groundwater quality data has not been performed as recommended per the previous five-year review. Additionally, the annual report format that has been used since March 2004 includes a table that only presents contaminants of concern (COCs) detected during that particular sampling event. A table that provides cumulative groundwater quality data over time is no longer included as part of this most current reporting format. A table providing cumulative groundwater quality data would be useful in interpreting possible changes in groundwater quality trends with time.

Review of provided data also indicates that the conveyance notice (i.e., deed notice) has not been finalized nor filed with the Vermilion Parish Clerk, as recommended during the previous five-year review. This form of IC should be completed to ensure that future landowners are aware of the environmental conditions associated with the site, and the recommended restrictions are in place for residential use, invasive activities that could damage the site's cap, and groundwater use at the site.

6.0 FIVE-YEAR REVIEW PROCESS

This section presents the process and findings of the second five-year review. Specifically, this section presents the findings of surveys, a site inspection, an applicable or relevant and appropriate requirements (ARARs) review, and a data review.

6.1 ADMINISTRATIVE COMPONENTS

The PAB site second five-year review team was lead by Mr. Michael Hebert of EPA, Remedial Project Manager, with participation from Mr. Todd Thibodeaux, the LDEQ Project Manager. Mr. Mark Paddock and Ms. April Ballweg, representatives from EA Engineering, Science, and Technology, Inc. (EA), assisted in the review process.

In February 2007, the review team established the review schedule, which included the following components:

- Community involvement
- Site inspection
- Local interviews
- ARARs review
- Data review
- Five-Year Review Report development and review

6.2 COMMUNITY INVOLVEMENT

Upon concurrence by EPA, the Second Five-Year Review Report will be placed in the information repositories for the PAB site, including the Vermilion Parish Library, the LDEQ office in Baton Rouge, Louisiana, and the EPA Region 6 office in Dallas, Texas. A notice will then be published in the local newspaper to summarize the review findings and announce the availability of the report at the information repositories.

6.3 DOCUMENT REVIEW

This second five-year review for the PAB site included a review of relevant site documents, including decision documents, construction and implementation reports, sampling reports, and related monitoring data. The complete list of documents reviewed during this second five-year review is provided in Attachment 3.

6.4 DATA REVIEW

Review of cumulative groundwater quality data prepared for the five-year review indicates that overall, there has been little change in groundwater quality since the previous five-year review, with metals being the only site COCs exceeding MCLs. Groundwater quality data for metals is summarized in Attachment 4, and Attachment 2 illustrates the location of existing monitoring wells in reference to historic features utilized while PAB Oil and Chemical Services, Inc. was in operation. A discussion of groundwater quality data for metals on a well by well basis is presented below:

- MW-1—This well is part of the “nested” MW-1/MW-2 well pair, and is reportedly screened from 120 to 130 feet bgs within the deeper aquifer unit. MW-1 is situated in close proximity to the tank battery location, and is approximately 50 feet west (downgradient) of the of the site’s capped former disposal pits. Review of cumulative groundwater quality data indicates that this well has been sampled only once since January 2001, and this sampling event occurred as part of the Hurricane Rita Assessment conducted for the site in October 2005. Analysis of the groundwater sample collected from this well revealed barium, cadmium, chromium, copper, nickel, and zinc concentrations, all of which were below their respective MCLs and LDEQ Risk Evaluation/Corrective Action Program (RECAP) screening standards for groundwater. Arsenic was detected in this sample at a concentration of 0.0219 mg/L, which exceeds the MCL/LDEQ RECAP groundwater screening standard of 0.010 mg/L.
- MW-2—This well has been sampled from January 2001 through March 2007. MW-2 is situated in close proximity to the tank battery location, and is approximately 75 feet west (downgradient) of the of the site’s capped former disposal pits. MW-2 is part of a “nested” pair of wells, and is reportedly screened from 35 to 40 feet bgs within the shallow aquifer unit. This well has sporadically displayed metal concentrations in groundwater collected from this well, with all but one of the detections being below respective MCLs. The exception was an arsenic concentration of 0.012 mg/L, which was detected during the March 2005 groundwater sampling event, and exceeded the MCL and LDEQ RECAP groundwater screening standard of 0.010 mg/L. Nickel concentrations ranging from 0.14 mg/L to 0.78 mg/L were also detected during four of the seven groundwater sampling events. These nickel concentrations exceeded the LDEQ RECAP groundwater screening standard of 0.073 mg/L.
- MW-3—This well was sampled from January 2001 through August 2003. MW-3 is situated along the south side of the capped former disposal pits. MW-3 has consistently displayed metal concentrations that were either below laboratory method detection limits and/or MCLs during this review period. Nickel concentrations ranging from 0.076 mg/L to 0.28 mg/L were also detected in this well, which exceeded the LDEQ RECAP groundwater screening standard of 0.073 mg/L.
- MW-4—This well is situated adjacent to the northeast corner of the capped disposal pits. Review of cumulative groundwater quality data indicates that this well has been sampled only once since January 2001, and this sampling event occurred as part of the Hurricane Rita Assessment conducted for the site in October 2005. Analyses of the groundwater sample collected from this well revealed arsenic, barium, cadmium, copper, and zinc concentrations; all of which were below their respective MCLs. Chromium was detected in this sample at a concentration of 0.147 mg/L, which exceeded the MCL and LDEQ RECAP groundwater screening standard of 0.10 mg/L. The

nickel concentration of 0.313 mg/L exceeded the LDEQ RECAP groundwater screening standard of 0.073 mg/L.

- MW-5—This well was sampled from January 2001 through August 2003. MW-5 is situated immediately north of the former saltwater pond, and approximately 400 feet northwest (downgradient) of the site's capped former disposal pits. This well consistently displayed metal concentrations that were either below laboratory method detection limits and/or MCLs during this sampling period.
- MW-6—This well has been sampled from January 2001 through March 2007. MW-6 is situated within the northwest portion of the site, just north of the former northwest pond. Due to its downgradient location, this well serves as the "sentinel" well for the site. This well has displayed metal concentrations in groundwater that are below their respective MCLs during all but one of the sampling events conducted during this review period. The exception was arsenic, which was detected during the March 2005 groundwater sampling event at a concentration of 0.014 mg/L. This concentration exceeded the arsenic MCL and LDEQ RECAP groundwater screening standard of 0.010 mg/L. Nickel concentrations ranging from 0.073 mg/L to 0.19 mg/L were also detected in groundwater samples collected during this review period. These nickel concentrations exceeded the LDEQ RECAP groundwater screening standard of 0.073 mg/L.
- MW-8—This well is situated in close proximity to the northwest corner of the capped former disposal pits. Sampling of this well was not initiated until March 2004, and it has been sampled on a consistent basis since this time. Barium has been detected in this well on a consistent basis. During the March 2007 sampling event, chromium, nickel, selenium, zinc, and arsenic were also detected at concentrations below their respective MCLs and LDEQ RECAP groundwater screening standards. These metal detections may be due to Project Navigator switching to a different laboratory with lower method detection limits. Arsenic was the only metal that exceeded the MCL/LDEQ RECAP groundwater screening standard (0.010 mg/L) during this review period; it was detected at a concentration of 0.016 mg/L during the March 2005 groundwater sampling event.
- MW-9—This well is situated in close proximity to the east-central perimeter of the capped former disposal pits. Groundwater samples have been collected from this well on a consistent basis since January 2001. MW-9 has displayed barium concentrations on a consistent basis, with sporadic detections of chromium, copper, and zinc, each of which have been below their respective MCLs and LDEQ RECAP groundwater screening standards.
- MW-7, MW-10, MW-11, and MW-12—These monitoring wells were not sampled for metals during the second five-year review period. Monitoring wells MW-10, MW-11, and MW-12 were plugged and abandoned in March 2004. Consequently, recent trends relating to groundwater metal concentrations cannot be established in the vicinity of these wells.

In summary, based on review of groundwater quality data, arsenic and chromium were the only metals detected at concentrations exceeding their respective MCLs. Arsenic concentrations that exceeded the MCL of 0.010 mg/L were detected in MW-2 (0.012), MW-6 (0.014), and MW-8 (0.016 mg/L) during the March 2005 sampling event, and in MW-1 (0.0219 mg/L) during the October 2005 Hurricane Rita sampling event. However, arsenic was not detected on a consistent basis during the second five-year

review period, and has not been historically detected on a consistent basis, suggesting these detections are not associated with the site, but instead, possibly due to elevated background concentrations. MW-4 displayed a chromium concentration of 0.147 mg/L during the October 2005 Hurricane Rita sampling event. This was the only groundwater sample collected from MW-4 during this five-year review period.

6.5 ARAR REVIEW

The first five-year review was completed by EPA on July 26, 2002, in which no changes in ARARs were identified. As part of this second five-year review, ARARs identified in the ROD were reviewed to determine if any newly promulgated or modified requirements of federal and state environmental laws have significantly changed the protectiveness of the remedy implemented at the site since the last five-year review was conducted. The ARARs reviewed were those included in the site's decision documents as they apply to the selected Alternative 4 (Surface Water Treatment, Excavation and Onsite Residuals Solidification/Stabilization, Onsite Disposal, Clay Cover, Groundwater Monitoring). The ARARs specifically identified on pages 54 and 55 of the 1993 ROD are as follows:

Chemical-Specific ARARs

- State and Federal water quality standards and criteria established under the Clean Water Act (Section 303, Clean Water Act, 1987, as amended, and Title 33 of the LAC Chapter 11) —Applicable because treated surface water was to be discharged to site drainage ditches.

These discharge limitations were applied to the discharge of surface water below the RAO levels, or treated surface waters that met the RAOs. The State of Louisiana established the RAOs for surface water prior to discharge. The surface water treatment process was completed, and currently, no surface water is collected, treated, or discharged.

- National Ambient Air Quality Standards (40 Code of Federal Regulations [CFR] 50.6). Relevant and appropriate during excavation.

These air quality standards were relevant and appropriate when applied to the vapors and particulate matter released during the excavation, treatment, and consolidation of wastes. Since waste excavation, treatment and consolidation have been completed, these standards are no longer relevant and appropriate.

Action-Specific ARARs

- Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR 264), including Subparts G, L, M, and N—Relevant and Appropriate during waste treatment, disposal, and long-term monitoring. Specifically:
 - Requirements for placement of a cap over waste as required by 40 CFR 264.310(a), 264.117(c), and 264.310(b)
 - Closure of land treatment units as required by 40 CFR 264.280
 - Operation of land treatment units as required by 40 CFR 264.271 and 264.273
 - Surface water control as required by 40 CFR 264.251(c) and (d) and 264.301(c) and (d)

The requirements for groundwater monitoring in Part 264 Subchapter F are incorporated by reference in 40 CFR 264.310(b). Also included as an ARAR was State of Louisiana Statewide Order 29-B, dated October 20, 1990; specifically, Sections 129.B.6 and 129.M.7. The amendment to Statewide Order 29-B addressed pit closure and land treatment requirements for non-hazardous oil field waste, as defined by Statewide Order 29-B, which were disposed of at the site.

The construction quality assurance program used during the RA addressed the substantive requirements of 40 CFR 264 by addressing surface and storm water run-on and run-off, groundwater collection and treatment during waste consolidation and treatment, and installation of the final cover. The March 12, 1997 ESD eliminated the biological treatment portion of the initially selected remedy in the 1993 ROD; therefore the requirements of Subpart M are no longer relevant.

Because one of the RAOs for the 1993 ROD is prevention of potential human exposure to contaminated groundwater, the following ARAR was also included for evaluation during this second five-year review process:

Applicable Requirements

- Safe Drinking Water Act (SDWA) —Establishes drinking water standards (40[CFR] 141.11)

The following discussion of applicable requirements presents particular findings from this second five-year review of ARARs that serve as points of clarification relevant to the existing remedial implementation O&M.

6.5.1 Federal ARARs

Under the Federal SDWA, the current clean-up standard or MCL established for COCs historically detected in groundwater are presented on Attachment 4. These MCLs serve as the applicable regulatory treatment standard for groundwater unless more stringent standards are promulgated.

6.5.2 State ARARs

Chemical-specific standards have also been developed under the LDEQ RECAP that was promulgated June 20, 2000, and finalized on October 20, 2003. However, because the 1993 ROD was approved by LDEQ prior to the effective date, RECAP is not an ARAR for the PAB site.

Although not an ARAR, the RECAP groundwater screening standards for metals historically detected at the PAB site have been included for consideration and are presented in Attachment 4. The LDEQ RECAP groundwater screening standards are set to MCLs for all but one of the metals monitored at the site. LDEQ has established a nickel groundwater screening standard of 0.073 mg/L, based on the non-carcinogenic health effects of this metal.

6.5.3 Newly Promulgated Potential ARARs

In summary, it appears that no other new laws or regulations have been promulgated or enacted that would call into question the effectiveness of the remedy at the site to protect human health and the environment. EPA will continue to monitor this site and any future changes in ARARs will be reported in the next five-year review.

6.6 SITE INSPECTION

A site inspection was conducted on March 28, 2007, to assess the condition of the PAB site and the measures employed to protect human health and the environment from the contaminants still present at the site. Attendees included: (1) Michael Hebert of EPA; (2) Todd Thibodeaux of LDEQ; (3) Josh Teves of Project Navigator; (4) Tom Vrenick and Wanda Walters of Aquaterra; and (5) Mark Paddack and April Ballweg of EA. The site inspection checklist is included in Attachment 5. Site survey forms are provided in Attachment 6. A photographic log of the inspection is included in Attachment 7.

No evidence of contamination was visible at the PAB site. The site's general appearance is good, with a stand of spring vegetation that had been cut during the 1st Quarter 2007 O&M activities. The inspection team investigated the site within the boundary of the fence. In addition, the team observed the groundwater monitor wells, and the site's cap, which is situated on the eastern portion of the site.

The vegetation at the site appeared to be in good condition. The wells appeared to be in overall good condition, except for signs of burrowing by small animals under two of the well slabs. The site's cap also appeared to be in good condition, with a thick stand of healthy vegetation, and no signs of erosion or major settlement/ponding issues. There were a few low areas noted (due to settlement) over the former saltwater pond area that may accumulate water during major rain events. Site access to vehicular traffic appeared to be sufficiently restricted by a locked gate at the northwest corner of the property. There were, however, signs of trespassing along the south portion of the property where breaches were noted in the barbed-wire fence surrounding the site.

6.7 SITE INTERVIEWS

In accordance with the community involvement requirements of the five-year review process, key individuals to be surveyed were identified by EPA. Completed survey forms for the following individuals are included in Attachment 6:

- Todd Thibodeaux, LDEQ
- Allen LaBry, CPA/Past President, Abbeville, LA Chamber of Commerce
- Chris Theriot, Adm/Secretary/Treasurer, Vermilion Parish Police Jury

Overall, the received responses were positive, and no serious issues or concerns were identified by any of the responding interviewees. Continuing or unresolved issues that were brought up through the interview process are as follows.

Comments received from Mr. Todd Thibodeaux (LDEQ):

- “On a site inspection in 2005 I did notice that someone had unscrewed the gate hinges from the post they were attached to. The gate was laid down and unbroken. I didn't notice any damage done to the monitoring wells. I contacted Tom Vrenick with Aquaterra (one of PRP's consultants) about the gates. On my next site inspection the gate had been re-attached.”

- “If [it] hasn’t already been done, the site could use mowing. Also there are low areas in the backfill of the old saltwater pond. They hold water and could be filled with fresh backfill.”

7.0 TECHNICAL ASSESSMENT

The conclusions presented in this section support the determination that the selected remedy for the PAB site is currently protective of human health and the environment. EPA Guidance indicates that to assess the protectiveness of a remedy, three questions (Questions A, B, and C) shall be answered.

7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

- **RA performance**—Based on review of documents, ARARs, the site inspection, the selected remedy for the PAB site has been completed in accordance with the site’s ROD and ESD. VOCs and SVOCs have consistently either been below laboratory method detection limits or below MCLs since the RA. Some metals have been detected in groundwater since the RA, but none of the detected metal concentrations have exceeded performance standards for the site’s monitored wells on a consistent basis. Review of cumulative groundwater quality data suggests no significant changes in metal concentrations since the RA; however, a statistical analysis of groundwater quality trend needs to be performed to verify this trend.
- **Cost of system and O&M**—Project Navigator would not disclose annual O&M cost information for fiscal years 2002 through 2007. However, as indicated in the first five-year review report, the incurred O&M costs were significantly lower than the anticipated costs in the ROD due to a reduction in well sampling activities during the first five-year review period, where only five of the site’s 12 wells were sampled. In December 2003, further reduction in O&M activities was approved by EPA, which may have resulted in further cost reductions for annual O&M activities.
- **Opportunities for optimization**—There were no opportunities for optimization observed during this second five-year review. Applicable reductions in O&M activities have already been made at the site during this five-year review period.
- **Early indicators of potential issues**—None.
- **Implementation of ICs and other measures** – As recommended during the previous five-year review, a deed notice should be filed by the PAB Group with the Vermilion Parish Clerk to restrict residential use of the property, restrict drilling/excavation activities that could jeopardize the integrity of the site’s cap, and restrict groundwater use at the site. In addition, repairs to the barbed-wire fence surrounding the site should be made.

7.2 QUESTION B: ARE THE ASSUMPTIONS USED AT THE TIME OF REMEDY SELECTION STILL VALID?

- **Changes in exposure pathways**—There have been no changes that bear on the protectiveness of the selected remedy.

- **Changes in standards, newly promulgated standards, and to-be-considered**—LDEQ finalized RECAP standards in 2003 which lowered the groundwater screening standard for nickel to 0.073 mg/L. No other new laws or regulations have been promulgated or enacted that would call into question the effectiveness of the remedy at the site to protect human health and the environment.
- **Changes in toxicity and other contaminant characteristics**—There have been no changes during the past five years that bear on the protectiveness of the selected remedy.
- **Changes in land use**—There have been no changes in land use at the site that bear on the protectiveness of the selected remedy. Properties to the north and south of the site are undergoing continued single-family residential development, but the real estate agent for the subdivision under construction north (downgradient) of the site indicated that public water would be supplied to this subdivision.
- **New contaminants and/or contaminant sources**—There have been no new contaminants or contaminant sources identified at the site.
- **Expected progress toward meeting RA Objectives**—The RAOs relating to contaminated groundwater have been met in all but three of the wells currently monitored. Further groundwater monitoring is needed to establish that the RAO is being met.

7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

The type of other information that might call into question the protectiveness of the remedy includes potential future land use changes in the vicinity of the site or other unexpected changes in site conditions or exposure pathways. No other information has come to light as part of this second five-year review for the site that would call into question the protectiveness of the site remedy.

7.4 TECHNICAL ASSESSMENT SUMMARY

According to documents and data reviewed, the site inspection, and interviews, the remedy appears to be functioning as intended by the 1993 ROD and 1997 ESD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The ARARs cited in the ROD have been met. There have been no changes in toxicity factors for the primary contaminants of concern during the five-year review period, and there has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The implementation of ICs (a deed notice) at the site would help further protect human health and the environment (Section 8.1). There is no other information that calls into question the protectiveness of the remedy.

8.0 INSTITUTIONAL CONTROLS

ICs are generally defined as non-engineered instruments such as administrative and legal tools that do not involve construction or physically change the site and that help minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use (EPA 2005). ICs can be used for many reasons including restriction of site use, modifying behavior, and providing information to individuals (EPA 2000b). ICs may include easements, covenants, restrictions or other conditions on deeds, and/or groundwater and/or land use restriction documents (EPA 2001). The following sections describe the type of ICs needing to be implemented at the PAB site, the potential effect of future land use plans on ICs, and any plans for changes to site contamination status.

8.1 TYPES OF INSTITUTIONAL CONTROLS IN PLACE AT THE SITE

The first five-year review (completed in June 2002) previously identified the need for ICs to be implemented at the PAB site, and a recommendation was made that PAB Group file a conveyance notice (i.e., deed notice) with the Vermilion Parish Clerk to restrict residential use of the property, drilling and/or excavation activities that could breach the integrity of the site's cap, and use of groundwater at the site. PAB Group indicates they have been working on filing the deed notice for the site, but they had not completed this task at the time this second five-year review was completed. Therefore, the recommendation continues to be made that PAB Group complete implementation of ICs in the form of a deed notice.

8.2 EFFECT OF FUTURE LAND USE PLANS ON INSTITUTIONAL CONTROLS

No future land uses have been established or are anticipated for the PAB site that would require an adjustment to the ICs currently being recommended. However, increased residential development has occurred immediately south of the site since the prior five-year review, and the adjacent north property was observed as being under development for single family residential usage at the time of the site inspection, which occurred on March 28, 2007. Although the risk of trespassers coming into contact with site COCs is considered minimal, due to the historical nature of the site, improvement of the fence surrounding the property, and placement of warning signs along the site perimeters would help minimize trespassing and potential liabilities associated with people trespassing on the site. Keller Williams, the real estate agent for Vermilion Chateau (the residential subdivision under development north of the site), indicated public water would be supplied to these residences from Vermilion Parish Water District 1.

8.3 PLANS FOR CHANGES TO SITE CONTAMINATION STATUS

No changes to the status of the contamination at the PAB site are anticipated.

9.0 ISSUES

This section describes issues associated with the PAB site identified during the second five-year review:

- **Monitoring Well/Site O&M**—The site inspection indicated burrowing animals have burrowed under the concrete well pads associated with monitoring wells MW-3 and MW-8. Additionally, it appears that a tree with a trunk approximately 5 inches in diameter was allowed to grow adjacent to the MW-8 well pad, but had been recently cut and removed prior to the five-year review inspection. These conditions could cause localized shifting of the ground surface, and could jeopardize the integrity of these wells. Additionally, these wells are situated in close proximity to the site's cap, and steps should be taken to prevent burrowing animals from inhabiting this portion of the site. LDEQ also noted in their survey response that site vegetation needed to be mowed, and several low areas associated with the former saltwater pond needed to be dressed and/or backfilled.
- **Sampling of Monitoring Well Network**—Localized groundwater flow beneath the site appears to be northwest. MW-5 is situated downgradient of the former tank battery and the capped disposal pits. Groundwater samples were collected and analyzed for this well from January 2001 through August 2003, and during this time period, COCs were either below method detection limits and/or applicable MCLs. Consequently, this well was dropped from the groundwater monitoring program in late 2003. Periodic groundwater quality data from this well would help monitor the long-term effectiveness of the RA.
- **Institutional Controls (ICs)**—The implementation of ICs in the form of a conveyance notice (i.e., deed notice) was recommended during the previous five-year review in order to restrict residential use of the site, prevent future drilling/excavation activities that could jeopardize the integrity of the site's cap, and to restrict groundwater use at the site. This second five-year review indicated the previously recommended deed notice has not been implemented for the site.
- **Perimeter Fence O&M**—Breaches in the fence surrounding the site were noted during the previous five-year review. The March 2007 site inspection indicated that the fencing surrounding the site is a barbed-wire fence. Breaches continued to be noted along the north and south segments of this perimeter fencing during the March 2007 site inspection.
- **Analyte Detection Limits**—During the previous five-year review, it was noted that laboratory detection limits exceeded MCLs for a portion of the analyzed metals. Review of groundwater quality data collected during the current five-year review period indicates that the laboratory method detection limits reported by Gulf Coast Analytical Services (GCAL) were consistently higher than the respective MCL for beryllium, antimony, and thallium during the September 2002 through March 2006 groundwater monitoring events. SPL was used to analyze groundwater samples collected during the 2007 annual groundwater monitoring event, and laboratory detection limits for all metals were at/below their respective MCLs for the analyzed groundwater samples.

- Statistical Analysis of Groundwater Data**—Statistical analysis of groundwater data was recommended during the previous five-year review. Based on a review of the data provided for the current five-year review, statistical analysis of this data has not been performed. Additionally, EPA and LDEQ approved a reduction of groundwater sampling and analysis activities to an annual basis in December 2003. Since that time, the reports generated for the annual groundwater monitoring and sampling events include tables that only present results for that particular sampling event, versus cumulative analytical data that would give a better indication of groundwater quality trends with time on a well by well basis.
- Use of Total Organic Carbon (TOC) Analysis in lieu of Volatile Organic Compound (VOC) and Semivolatile Organic Compound (SVOC) Analyses**—In December 2003 EPA and LDEQ approved the reduction in O&M activities for the site. This approved reduction included reducing the number of wells sampled to MW-2, MW-6, MW-8, and MW-9 on an annual basis, with groundwater samples collected from these wells being analyzed for metals and TOC. If TOC concentrations were detected, then the EPA would be consulted, and the affected well(s) and downgradient well(s) would be re-sampled and the groundwater samples would be analyzed for VOCs and SVOCs. TOC detections occurred during the 2004 and 2006 annual groundwater monitoring events. However, no data was provided which indicates these wells were re-sampled for VOC or SVOC analyses during these two groundwater monitoring events. TOC concentrations were also detected during the 2007 annual monitoring event, and monitor wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9 were sampled/re-sampled for VOCs and SVOCs. Bis(2-ethylhexyl)phthalate was the only SVOC detected, at a concentration of 7.4 µg/L in MW-7. All other VOC and SVOC concentrations were below laboratory method detection limits for the remaining wells.

A summary table of issues identified and their potential effect on the remedy protectiveness (Table 2) is provided below.

TABLE 2
ISSUES IDENTIFIED
PAB OIL AND CHEMICAL SERVICES SUPERFUND SITE

Issue	Currently Affects Remedy Protectiveness (Yes/No)
Monitoring Well O&M	No
Sampling of Monitoring Well Network	No
Institutional Controls	Yes
Perimeter Fence O&M	No
Analyte Detection Limits	No
Groundwater Statistical Analysis	No
TOC Analysis (in lieu of VOC/SVOC Analyses)	No

10.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The following recommendations and follow-up actions are being made based on the site inspection and the five-year review process.

1. Take necessary steps to eliminate favorable conditions for burrowing animals in the vicinity of the monitoring wells and site cap. Eliminate the excess growth of trees and other vegetation around the wells and across the site, per the agreed semiannual O&M schedule. Routine management of the site's vegetation may also help reduce habitat for the burrowing animals and other biological hazards, such as snakes and stinging insects. Backfill and dress low areas associated with the former saltwater pond in order to reduce ponding of surface water during heavy rain conditions.
2. Although MW-5 has historically displayed site COCs that were either below laboratory method detection limits and/or applicable MCLs, the reinstatement of MW-5 into the groundwater sampling program for periodic sampling would help monitor the long-term protectiveness of the RA.
3. Complete and file a deed notice with Vermilion Parish to restrict residential use of the property, restrict groundwater use at the site, and restrict excavation/boring activities that could jeopardize the site's cap.
4. Repair the perimeter fencing, and post the property perimeter with warning signs.
5. Continue use of an analytical laboratory that is capable of providing laboratory detection limits at (or below) the respective MCL for each analyte.
6. Perform a statistical analysis of groundwater quality data to ensure groundwater quality is not degrading with time. Prepare a cumulative groundwater quality data table for metal results and update/present this table during each of the annual groundwater reporting events. This will assist in monitoring changes in groundwater quality with time at the site, and can also be used to graphically present any of these changes.
7. Review of groundwater quality data collected since the reduction of O&M activities (approved December 2003) indicates TOC has been detected in collected groundwater samples during three of the four annual monitoring and sampling events. A trend may be developing where utilization of the reduced VOC/SVOC analyses protocol may actually cost more for O&M activities than sampling and analyzing the wells for all site COCs as part of the initial groundwater sampling event. This additional cost is due to the need to re-mobilize field crews and additional time to re-sample the wells (and downgradient wells) versus the cost for the VOC and SVOC analyses. Because of this situation, sampling and initial analyses of groundwater samples for all site COCs (metals, VOCs, and SVOCs) is recommended.

Table 3 summarizes the recommendations and follow-up actions for the PAB site.

TABLE 3

**RECOMMENDATIONS AND FOLLOW-UP ACTIONS
PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE**

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)
Monitoring Well/Site O&M	Prevent burrowing animals under well pads and on/near cap; control site vegetation as specified in O&M plan; eliminate low areas on top of former saltwater pond.	PAB Group, LLC	EPA	Within 1 year of submittal of this report	No
Sampling of Monitoring Well Network	Reinstate MW-5 into the groundwater sampling program for periodic sampling.	PAB Group, LLC	EPA	Next groundwater sampling event	No
Institutional Controls (ICs)	Complete and file a deed notice with Vermilion Parish for site restrictions specified within this document.	PAB Group, LLC	EPA	Within 1 year of submittal of this report	Yes
Perimeter Fence O&M	Repair the perimeter fencing; post the property perimeter with warning signs.	PAB Group, LLC	EPA	Within 1 year of submittal of this report	No
Analyte Detection Limits	Continue use of an analytical laboratory that is capable of providing laboratory detection limits at (or below) the respective MCL for each analyte.	PAB Group, LLC	EPA	Continue with next planned groundwater sampling event	No
Statistical Analysis of Groundwater Data	Perform statistical analyses of groundwater quality data.	PAB Group, LLC	EPA	Within 1 year of submittal of this report	No
Use of TOC Analysis to Substitute VOC and SVOC Analyses	Analyze samples for VOCs and SVOCs to reduce O&M costs due to re-mobilization and re-sampling costs.	PAB Group, LLC	EPA	Within 1 year of submittal of this report	No

Notes:

EPA U.S. Environmental Protection Agency SVOCs Semivolatile Organic Compounds
O&M Operation and maintenance VOCs Volatile Organic Compounds
ICs Institutional Controls

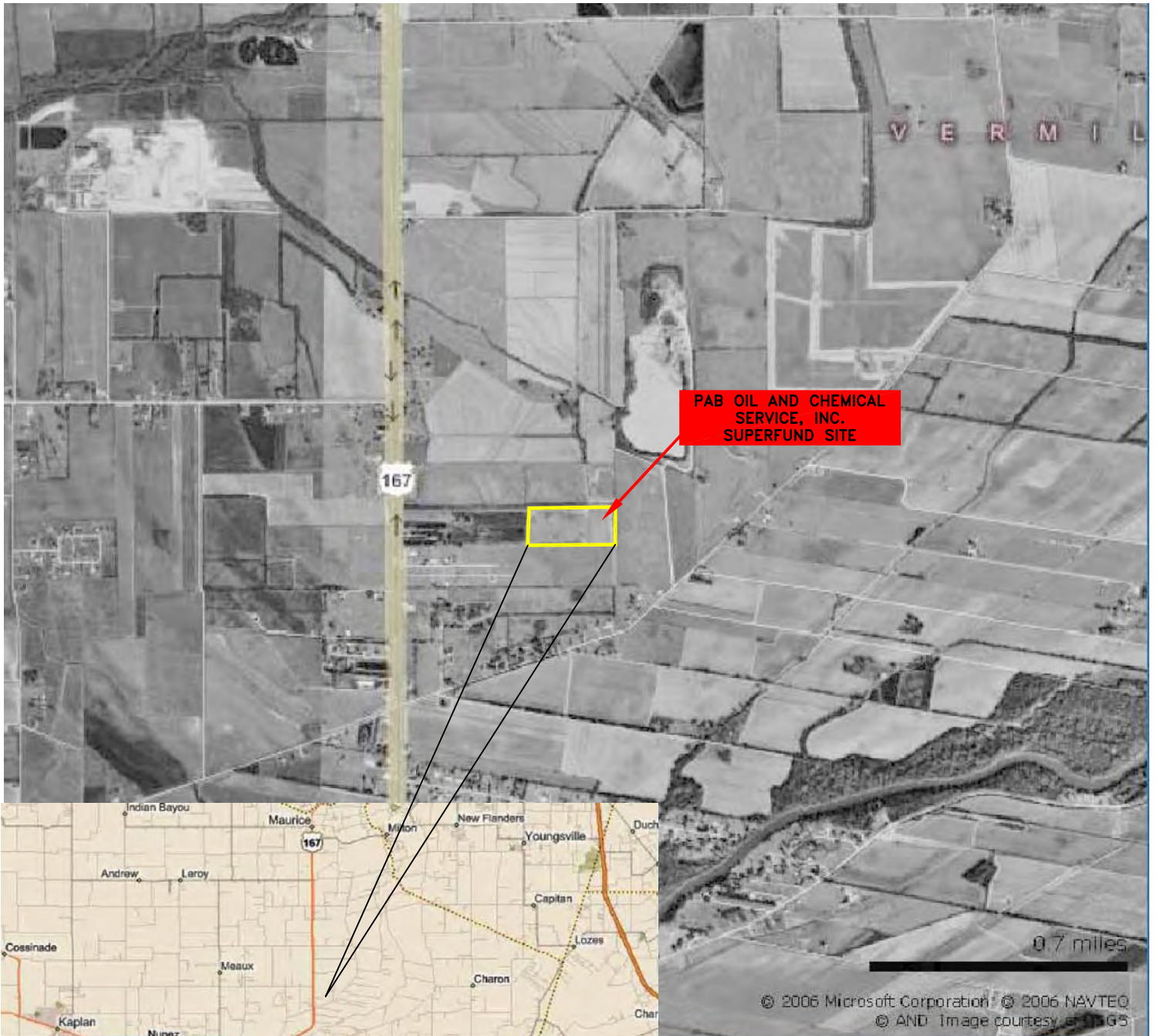
11.0 PROTECTIVENESS STATEMENT

Based on the information available during the second five-year review, the selected remedy for the PAB site will continue to be protective of human health and the environment in the long term provided that an IC in the form of a deed notice is executed for the site; and assessment and O&M activities continue as recommended.

12.0 NEXT REVIEW

The PAB site requires ongoing five-year reviews. The next review will be conducted within the next five years, but no later than July 2012.

Attachment 1
Site Location Map



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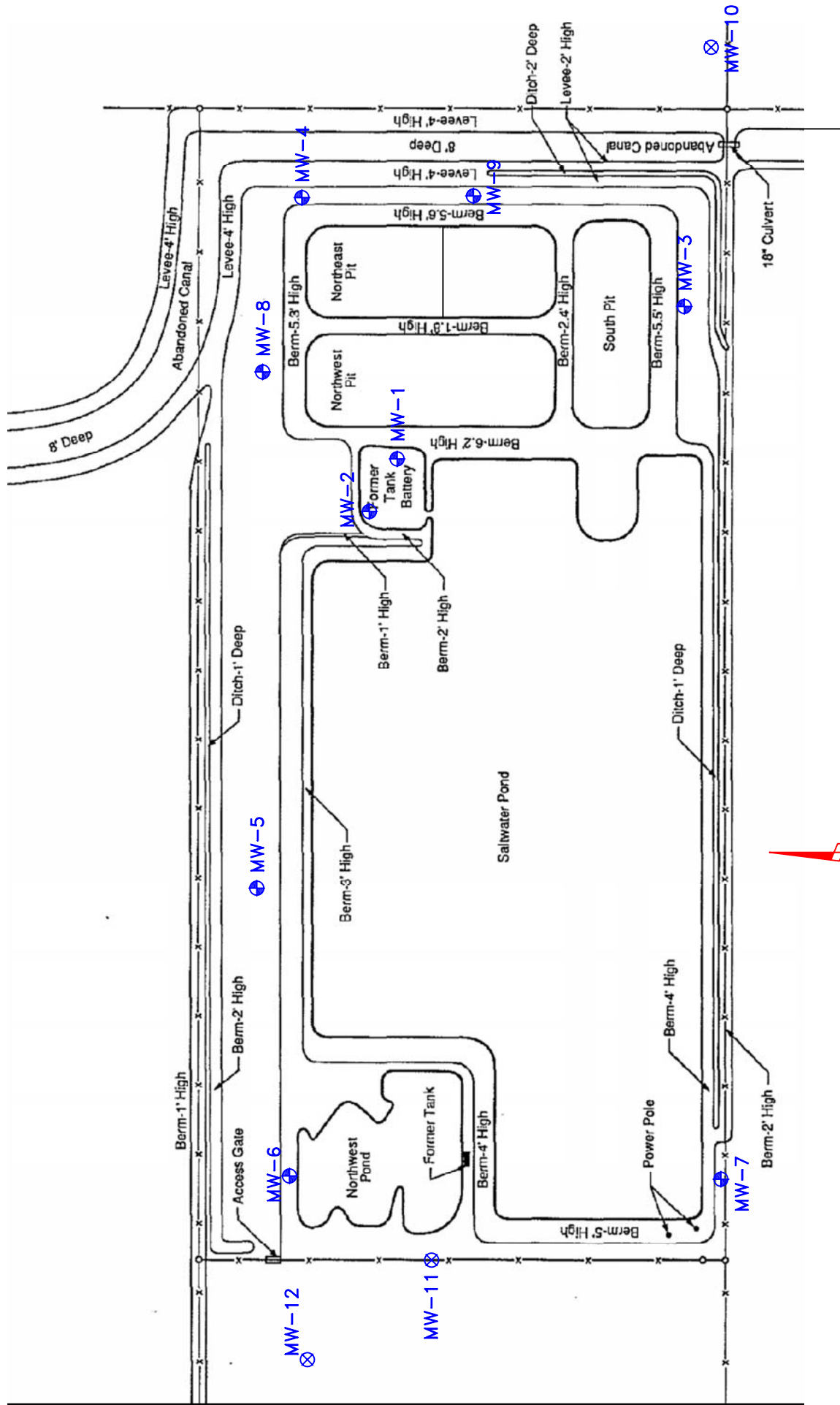


PAB OIL AND CHEMICAL SERVICES, INC.
VERMILION PARISH,
LOUISIANA

SITE LOCATION MAP

Attachment 2

Site Layout Map



LEGEND

- — MONITOR WELL
- ⊗ — PLUGGED AND ABANDONED WELL



PAB OIL AND CHEMICAL SERVICES, INC.
VERMILION PARISH,
LOUISIANA

SITE LAYOUT MAP

Attachment 3
Documents Reviewed

DOCUMENTS REVIEWED

- Aquaterra Engineering. 2004. First Quarter 2004 Inspection Sampling, PAB Oil and Chemical Services, Inc., Abbeville, Louisiana. April 16.
- Aquaterra Engineering. 2005. First Quarter 2005 Inspection Sampling, PAB Oil and Chemical Services, Inc., Abbeville, Louisiana. March 31.
- Aquaterra Engineering. 2006. First Quarter 2006 Inspection Sampling, PAB Oil and Chemical Services, Inc., Abbeville, Louisiana. May 19.
- CH2MHill. 2006. Hurricane Rita Response, PAB Oil and Chemical Superfund Site, Louisiana. February 3.
- Environmental Solutions, Inc. 1995. Final Quality Assurance Project Plan, PAB Oil and Chemical Services, Inc. Superfund Site, Vermilion Parish, Louisiana. July.
- Louisiana Department of Environmental Quality (LDEQ). 2002. Comments on Five-year Review Report, PAB Oil and Chemical Services, Inc. Superfund Site; AI Number (4790), Abbeville, Vermilion Parish. June 24.
- LDEQ. 2003a. Risk Evaluation/Corrective Action Program (RECAP). October 20.
- LDEQ. 2003b. LDEQ Reduction in O&M Approval Memorandum. December 1.
- LDEQ. 2004. Abandonment of Groundwater Monitoring Well Work Plan Approval Memorandum. February 19.
- Project Navigator, Ltd. 2002a. Second Quarter 2002 Inspection Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. June 28.
- Project Navigator, Ltd. 2002b. Third Quarter 2002 Inspection and Monitoring Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. October 30.
- Project Navigator, Ltd. 2002c. Fourth Quarter 2002 Inspection Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. December 23.
- Project Navigator, Ltd. 2003a. First Quarter 2003 Inspection and Monitoring Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. April 16.
- Project Navigator, Ltd. 2003b. Second Quarter 2003 Inspection Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. June 27.
- Project Navigator, Ltd. 2003c. Third Quarter 2003 Inspection and Monitoring Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. September 19.

Project Navigator, Ltd. 2003d. Memorandum Requesting Reduction in O&M Activities; PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. August 27.

Project Navigator, Ltd. 2003e. Memorandum Requesting Reduction in O&M Activities (Revision 1.0); PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. October 20.

Project Navigator, Ltd. 2004a. Fourth Quarter 2003 Inspection Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. January 7.

Project Navigator, Ltd. 2004b. Work Plan for Abandonment of Groundwater Monitoring Wells, PAB Oil and Chemical Services, Inc Site, Abbeville, Louisiana. January 22.

Project Navigator, Ltd. 2007. 2007 Annual Inspection and Monitoring Report: Operations and Maintenance Activities, PAB Oil and Chemical Services, Inc. Site, Abbeville, Louisiana. May 23.

Remediation Technologies, Inc. 1995. Remedial Design Sampling and Analysis Plan, PAB Oil and Chemical Services, Inc. Superfund Site, Vermilion Parish, Louisiana. May.

Remediation Technologies, Inc. 1997. Site Specific Health and Safety Plan for PAB Oil and Chemical Services, Inc. Superfund Site, Vermilion Parish, Louisiana. July 3.

Southern Petroleum Laboratories (SPL). 2007. Laboratory Reports for Groundwater Samples Collected During the 2007 Groundwater Sampling Event. March 6 and 27.

TRC Environmental Solutions, Inc (TRC). 1998. Operations and Maintenance Plan, PAB Oil & Chemical Services, Inc., Abbeville, Louisiana. September.

U.S. Environmental Protection Agency (EPA). 1993. Record of Decision, PAB Oil and Chemical Services, Inc. Superfund Site, Vermilion Parish, Louisiana. September 22.

EPA. 1994. Unilateral Administrative Order, PAB Oil and Chemical Services, Inc. Superfund Site, Abbeville, Vermilion Parish, Louisiana. September 27.

EPA. 1997a. Explanation of Significant Differences, PAB Oil and Chemical Services, Inc. Superfund Site, Abbeville, Louisiana. March 12.

EPA. 1997b. Consent Decree, PAB Oil and Chemical Services, Inc. Superfund Site, Abbeville, Vermilion Parish, Louisiana. May 27.

EPA. 1998a. Remedial Action Report, PAB Oil and Chemical Services, Inc. Superfund Site, Abbeville, Louisiana. August 27.

EPA. 1998b. Final Closeout Report, PAB Oil and Chemical Services, Inc. Superfund Site, Abbeville, Louisiana. August 28.

EPA. 2000a. NPL Deletion, PAB Oil and Chemical Services, Inc. Superfund Site, Vermilion Parish, Louisiana. January 3.

- EPA. 2000b. Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups". EPA 540-F-00-005. September.
- EPA. 2001. "Comprehensive Five-Year Review Guidance." EPA 540-R-01-007. June.
- EPA. 2002. First Five-year Review Report for the PAB Oil and Chemical Services, Inc. Superfund Site, Abbeville, Louisiana. July 26.
- EPA. 2003. Memorandum Approving Reduction in O&M Activities, PAB Oil Superfund Site, December 8.
- EPA. 2004. Approval of Work Plan for Abandonment of Groundwater Monitoring Wells Memorandum. February 24.
- EPA. 2005. "Institutional Controls: A Citizen's Guide to Understanding Institutional Controls at Superfund, Brownfields, Federal Facilities, Underground Storage Tank, and Resource Conservation and Recovery Act Cleanups." EPA-540-R-04-003. February.

Attachment 4

Cumulative Groundwater Metals Concentrations Table

**CUMULATIVE GROUND WATER METALS CONCENTRATIONS
PAB OIL AND CHEMICAL SERVICES, INC. SUPERFUND SITE
SECOND FIVE-YEAR REVIEW**

Well	Date	Arsenic (mg/L)	Silver (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Mercury (mg/L)	Lead (mg/L)	Nickel (mg/L)	Antimony (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Zinc (mg/L)
MW-11 (contd.)	2/20/2002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/19/2002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/17/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/20/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/23/2004	Well Plugged and Abandoned in March 2004													
MW-12	1/15/2001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/1/2001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/19/2002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/17/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/20/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/23/2004	Well Plugged and Abandoned in March 2004													
MCL		0.010	-	2.000	0.004	0.005	0.1	1.3	0.002	0.015	-	0.006	0.05	0.002	-
RECAP SS		0.010	0.018	2.000	0.004	0.005	0.1	1.3	0.002	0.015	0.073	0.006	0.05	0.002	1.100

Notes:

Boxed analytical data for each well was collected during the second five-year review period

Indicates laboratory detection limit is higher than respective MCL

0.125 Indicates detected concentration for analyte

0.125 Indicates detected concentration exceeds respective MCL and corresponding LDEQ RECAP Groundwater Screening Standard

0.125 Indicates detected concentration exceeds corresponding LDEQ RECAP Groundwater Screening Standard

* Indicates groundwater sample was collected as part of February 3, 2006 Hurricane Rita Assessment for the site.

"-" Indicates there is not a listed MCL for this metal

B Indicates analyte was detected in associated blank as well as sample.

DL Detection limits

J Estimated value; concentration is above method detection limit but below reporting limit.

LDEQ Louisiana Department of Environmental Quality

MCL Maximum Contaminant Level

NA Not analyzed

NS Not sampled

RECAP Risk Evaluation/Corrective Action Program

SS Screening standard

Attachment 5

Site Inspection Checklist

III. ONSITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
<input checked="" type="checkbox"/> O&M manual (long term monitoring plan)	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input checked="" type="checkbox"/> Maintenance logs (current and cumulative monitoring reports)	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____			
2. Site-Specific Health and Safety Plan			
<input checked="" type="checkbox"/> Site-Specific Health and Safety Plan	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input type="checkbox"/> Contingency plan/emergency response plan	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____			
3. O&M and OSHA Training Records			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: <u>Information not available during inspection.</u>			
4. Permits and Service Agreements			
<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Other permits _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____			
5. Gas Generation Records			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6. Settlement Monument Records			
	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
7. Groundwater Monitoring Records			
	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
8. Leachate Extraction Records			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
9. Discharge Compliance Records			
<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Water (effluent)	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____			
10. Daily Access/Security Logs			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____			

IV. O&M COSTS

1. O&M Organization

- State in-house Contractor for State PRP in-house
 Contractor for PRP Other _____

2. O&M Cost Records

- Readily available Up to date Funding mechanism/agreement in place
 Original O&M cost estimate Breakdown attached

Total annual cost by year for review period, if available

<u>Date</u>	<u>Date</u>	<u>Total Cost</u>	
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached
From _____ to _____		_____	- <input type="checkbox"/> Breakdown attached

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

Project Navigator indicated they were not at liberty to provide a cost for annual O&M costs.

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

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

Remarks: Fencing consists of barbed-wire fence. Breaches were noted in several areas along the north and south segments of this perimeter fencing.

B. Other Access Restrictions

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

Remarks: A “No Trespassing” sign is hung on the gated road entrance situated on the northwest corner of the property.

C. Institutional Controls

1. Implementation and enforcement

Site conditions imply ICs not properly implemented Yes No N/A
 Site conditions imply ICs not being fully enforced Yes No N/A

Type of monitoring (e.g., self-reporting, drive by) Groundwater Monitoring and other O&M activities

Frequency Annually

Responsible party/agency Project Navigator and Aquaterra Engineering

Contact <u>Josh Teves</u>	<u>PM/Project Navigator</u>	<u>03/28/07</u>	<u>713-534-5076</u>
Name	Title	Date	Phone no.

Reporting is up-to-date Yes No N/A
 Reports are verified by the lead agency Yes No N/A
 Specific requirements in deed or decision documents have been met Yes No N/A
 Violations have been reported Yes No N/A

Other problems or suggestions: Report attached

A deed notice needs to be filed with Vermilion Parish restricting residential development, groundwater use, and boring/excavation activities at the site.

2. Adequacy ICs are adequate ICs are inadequate N/A
 Remarks: See above comment for C.1.

D. General

1. Vandalism/trespassing Location shown on site map No vandalism evident
 Remarks: Trespassing is evident along south perimeter of property where there are breaches in the barbed-wire fence. A basketball was found on the property near one of these breaches, suggesting children are accessing the property.

2. Land use changes onsite N/A
 Remarks: No changes in onsite land use have occurred since the last five-year review period. The site remains unused.

3. Land use changes offsite N/A
 Remarks: Additional single-family residences have been constructed on the property south of the site. The property immediately north of the site is under development with Vermilion Chateau, a single family residential subdivision. Public water is to be supplied to the Vermilion Chateau Subdivision.

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A
 Remarks: The access road into the property is in good condition.

B. Other Site Conditions Applicable N/A
 Remarks: Several low areas pointed out by LDEQ do occur where the former saltwater pond existed, but these areas are not part of the site's cap, but instead represent an area that was clean closed during the RA and backfilled with clean imported fill. Dressing of these areas would help prevent ponding of water where

the former saltwater pond once existed.

VII. LANDFILL COVERS

Applicable

N/A

A. Landfill Surface

1. Settlement (Low spots) Location shown on site map Settlement not evident
 Areal extent _____ Depth _____
 Remarks: _____

2. Cracks Location shown on site map Cracking not evident
 Lengths _____ Widths _____ Depths _____
 Remarks: _____

3. Erosion Location shown on site map Erosion not evident
 Areal extent _____ Depth _____
 Remarks: _____

4. Holes Holes evident Holes not evident
 Areal extent _____ Depth _____
 Remarks: _____

5. Vegetative Cover Grass Cover properly established No signs of stress
 Trees/Shrubs (indicate size and locations on a diagram) (None)
 Remarks: _____

6. Alternative Cover (armored rock, concrete, etc.) N/A
 Remarks: _____

7. Bulges Location shown on site map Bulges not evident
 Areal extent _____ Depth _____
 Remarks: _____

8. Wet Areas/Water Damage Wet areas/water damage not evident

<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Areal extent _____
<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Areal extent _____
<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Areal extent _____
<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Areal extent _____

Remarks: _____

9. Slope Instability Slides Location shown on site map
 No evidence of slope instability Areal extent _____
 Remarks: _____

B. Benches		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1. Flows Bypass Bench	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay	
Remarks: _____			
2. Bench Breached	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay	
Remarks: _____			
3. Bench Overtopped	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay	
Remarks: _____			
C. Letdown Channels		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Settlement	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement	
Areal extent _____		Depth _____	
Remarks: _____			
2. Material Degradation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation	
Material type _____		Areal extent _____	
Remarks: _____			
3. Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of erosion	
Areal extent _____		Depth _____	
Remarks: _____			
4. Undercutting	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting	
Areal extent _____		Depth _____	
Remarks: _____			
5. Obstructions	Type _____	<input checked="" type="checkbox"/> No obstructions	<input type="checkbox"/> Location shown on site map
Areal extent _____		Size _____	
Remarks: _____			
6. Excessive Vegetative Growth	Type _____	<input checked="" type="checkbox"/> No evidence of excessive growth	<input type="checkbox"/> Vegetation in channels does not obstruct flow
<input type="checkbox"/> Location shown on site map		Areal extent _____	
Remarks: _____			

D. Cover Penetrations		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Gas Vents			
<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Active	<input type="checkbox"/> Passive	<input type="checkbox"/> Good condition
<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Needs O&M
		<input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A
Remarks: _____			
2. Gas Monitoring Probes			
<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A
Remarks: _____			
3. Monitoring Wells (within surface area of landfill)			
<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A
Remarks: _____			
4. Leachate Extraction Wells			
<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A
Remarks: _____			
5. Settlement Monuments			
	<input checked="" type="checkbox"/> Located	<input checked="" type="checkbox"/> Routinely surveyed	<input type="checkbox"/> N/A
Remarks: _____ Three settlement monuments located on the cap are surveyed every two years. No major settlement issues were noted in association with the site's cap.			
E. Gas Collection and Treatment		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Gas Treatment Facilities			
<input type="checkbox"/> Flaring	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/>	Collection for reuse
<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs O&M		
Remarks: _____ Not Applicable			
2. Gas Collection Wells, Manifolds, and Piping			
		<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs O&M
Remarks: _____ Not Applicable			
3. Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)			
<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A	
Remarks: _____			
F. Cover Drainage Layer		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Outlet Pipes Inspected			
	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A	
Remarks: _____			
2. Outlet Rock Inspected			
	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A	
Remarks: _____			
G. Detention/Sedimentation Ponds		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Siltation	Areal extent _____		Size _____

<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>	Siltation not evident
Remarks: _____			
<hr/>			
2. Erosion Areal extent _____ Depth _____			
<input type="checkbox"/> Erosion not evident			
Remarks: _____ Not Applicable			
<hr/>			
3. Outlet Works <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A			
Remarks: _____			
<hr/>			
4. Dam <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A			
Remarks: _____			
<hr/>			
H. Retaining Walls <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1. Deformations <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident			
Horizontal displacement _____		Vertical displacement _____	
Rotational displacement _____			
Remarks: _____ Not Applicable			
<hr/>			
2. Degradation <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident			
Remarks: _____ Not Applicable			
<hr/>			
I. Perimeter Ditches/Off-Site Discharge <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1. Siltation <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Siltation not evident			
Areal extent _____		Depth _____	
Remarks: _____			
<hr/>			
2. Vegetative Growth <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A			
<input checked="" type="checkbox"/> Vegetation does not impede flow			
Areal extent _____		Type _____	
Remarks: _____			
<hr/>			
3. Erosion <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident			
Areal extent _____		Depth _____	
Remarks: _____			
<hr/>			
4. Discharge Structure <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A			
Remarks: _____			
<hr/>			
VIII. VERTICAL BARRIER WALLS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1. Settlement <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident			
Areal extent _____		Depth _____	
Remarks: _____ Not Applicable			

2. Performance Monitoring Type of monitoring _____
 Performance not monitored Frequency _____ Evidence of breaching
 Head differential _____
 Remarks: _____ Not Applicable

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

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

1. Pumps, Wellhead Plumbing, and Electrical
 Good condition All required wells located Needs O&M N/A
 Remarks: _____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
 Good condition Needs O&M
 Remarks: _____ Not Applicable

3. Spare Parts and Equipment
 Readily available Good condition Requires upgrade Needs to be provided
 Remarks: _____ Not Applicable

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

1. Collection Structures, Pumps, and Electrical
 Good condition Needs O&M
 Remarks: _____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances
 Good condition Needs O&M
 Remarks: _____ Not Applicable

3. Spare Parts and Equipment
 Readily available Good condition Requires upgrade Needs to be provided
 Remarks: _____ Not Applicable

C. Treatment System	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Treatment Train (Check components that apply)		
<input type="checkbox"/> Metals removal	<input type="checkbox"/> Oil/water separation	<input type="checkbox"/> Bioremediation
<input type="checkbox"/> Air stripping	<input type="checkbox"/> Carbon absorbers	
<input type="checkbox"/> Filters _____		
<input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____		
<input type="checkbox"/> Others _____		
<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs O&M	
<input type="checkbox"/> Sampling ports properly marked and functional		
<input type="checkbox"/> Sampling/maintenance log displayed and up to date		
<input type="checkbox"/> Equipment properly identified		
<input type="checkbox"/> Quantity of groundwater treated annually _____		
<input type="checkbox"/> Quantity of surface water treated annually _____		
Remarks: <u>Not Applicable</u>		
2. Electrical Enclosures and Panels (Properly rated and functional)		
<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs O&M
Remarks: _____		
3. Tanks, Vaults, Storage Vessels		
<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Proper secondary containment
		<input type="checkbox"/> Needs O&M
Remarks: _____		
4. Discharge Structure and Appurtenances		
<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs O&M
Remarks: _____		
5. Treatment Building(s)		
<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Good condition (esp. roof and doorways)	<input type="checkbox"/> Needs repair
<input type="checkbox"/> Chemicals and equipment properly stored		
Remarks: _____		
6. Monitoring Wells (Pump-and-treatment remedy)		
<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A
Remarks: _____		
D. Monitored Natural Attenuation		
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1. Monitoring Wells (Natural attenuation remedy)		
<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
<input checked="" type="checkbox"/> All required wells located	<input checked="" type="checkbox"/> Needs O&M	<input type="checkbox"/> Good condition
		<input type="checkbox"/> N/A
Remarks: <u>Steps should be taken to eliminate burrowing under concrete well pads by small animals. O&M should include removing trees and brush before they grow large enough to possibly damage well pads.</u>		

X. OTHER REMEDIES

If there are remedies applied at the site that 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 RA was implemented to 1) prevent direct contact, ingestion, and migration of the disposal pit sludge and associated soil; 2) prevent direct contact with impacted surface water; and 3) prevent the potential for human exposure to impacted groundwater. Based on the site inspection and the data collected during this five-year review period, the RA continued to function as designed during this five-year review period.

B. Adequacy of O&M

Additional assessment downgradient of MW-6 is warranted. MW-5 should be reinstated into O&M program to periodically monitor groundwater quality downgradient of the site's capped disposal cell.

C. Early Indicators of Potential Remedy Failure

Conditions were noted during this review that need to be addressed in order to assure the long-term effectiveness of this remedy. These conditions include IC's not being implemented for the site in the form of a deed notice, and the nickel plume not being delineated to MCLs downgradient of MW-6.

D. Opportunities for Optimization

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

No opportunities for optimization were identified during this five-year review period

INSPECTION TEAM ROSTER

Name	Organization	Title
Mike Hebert	EPA Region 6	Remedial Project Manager
Todd Thibodeaux	LDEQ	Project Manager
Josh Teves	Project Navigator, Ltd.	Project Coordinator
Tom Vrenick	Aquaterra	Operations Manager
Wanda Walters	Aquaterra	Engineer
Mark Paddack	EA Engineering	Project Manager
April Ballweg	EA Engineering	Assistant Project Manager

Attachment 6
Interview Records

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY

Site Name: PAB Oil and Chemical Services, Inc.

EPA ID No.: LAD980749139

Location: Abbeville, Louisiana

Date: 3/2/2007

Contact Made By:

Name: Michael Hebert

Title: Remedial Project Manager

Organization: U.S. EPA

Telephone No.: (214) 665-8521

Street Address: 1455 Ross Avenue, Suite 1200

E-Mail: Hebert.Michael@epamail.epa.gov

City, State, Zip: Dallas, Texas 75202

Name: Mark Paddack

Title: Project Manager

Organization: EA

Telephone No.: (972) 459-5042

Street Address: 405 S. Highway 121, Building C, Suite 100

E-Mail: mpaddack@eaest.com

City, State, Zip: Lewisville, Texas 75067

Individual Contacted:

Name: Allen LaBry

Title: CPA/Past President

Organization: Abbeville, LA
Chamber of Commerce

Telephone No.: 337-893-7944

Street Address: PO Box 116

E-Mail:

City, State, Zip: Abbeville, Louisiana 70510

Survey Questions

1. What is your general impression of the work conducted at the site since the first Five-Year Review period (since July 2002)?

Excellent

2. What effect have site operations had on the surrounding community since the first Five-Year Review?

No adverse impact.

3. In the past five years, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

None

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)

Site Name: PAB Oil and Chemical Services, Inc.

EPA ID No.: LAD980749139

Location: Abbeville, Louisiana

Date: 3/2/2007

Allen LaBry Survey Questions (Cont.)

4. Are you aware of any events, incidents, or activities at the site in the past five years such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.

No/None

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

Yes

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

No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY

Site Name: PAB Oil and Chemical Services, Inc.

EPA ID No.: LAD980749139

Location: Abbeville, Louisiana

Date: 3/15/2007

Contact Made By:

Name: Michael Hebert

Title: Remedial Project Manager

Organization: U.S. EPA

Telephone No.: (214) 665-8521

Street Address: 1455 Ross Avenue, Suite 1200

E-Mail: Hebert.Michael@epamail.epa.gov

City, State, Zip: Dallas, Texas 75202

Name: Mark Paddack

Title: Project Manager

Organization: EA

Telephone No.: (972) 459-5042

Street Address: 405 S. Highway 121, Building C, Suite 100

E-Mail: mpaddack@eaest.com

City, State, Zip: Lewisville, Texas 75067

Individual Contacted:

Name: Chris Theriot

Title: Adm/Sec/Treas

Organization: Vermilion Parish
Police Jury

Telephone No.: 337-898-4300

Street Address: 100 N. State Street, Suite 200

E-Mail: Vermilionppj@yahoo.com

City, State, Zip: Abbeville, Louisiana 70510

Survey Questions

1. What is your general impression of the work conducted at the site since the first Five-Year Review period (since July 2002)?

All work was conducted in an efficient and workman like manner.

2. What effect have site operations had on the surrounding community since the first Five-Year Review?

None

3. In the past five years, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)

Site Name: PAB Oil and Chemical Services, Inc.

EPA ID No.: LAD980749139

Location: Abbeville, Louisiana

Date: 3/15/2007

Chris Theriot Survey Questions (Cont.)

4. Are you aware of any events, incidents, or activities at the site in the past five years such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.

No

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

Yes

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

No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY

Site Name: PAB Oil and Chemical Services, Inc.

EPA ID No.: LAD980749139

Location: Abbeville, Louisiana

Date: 3/12/2007

Contact Made By:

Name: Michael Hebert

Title: Remedial Project Manager

Organization: U.S. EPA

Telephone No.: (214) 665-8521

E-Mail: Hebert.Michael@epamail.epa.gov

Street Address: 1455 Ross Avenue, Suite 1200

City, State, Zip: Dallas, Texas 75202

Name: Mark Paddack

Title: Project Manager

Organization: EA

Telephone No.: (972) 459-5042

E-Mail: mpaddack@eaest.com

Street Address: 405 S. Highway 121, Building C, Suite 100

City, State, Zip: Lewisville, Texas 75067

Individual Contacted:

Name: Todd Thibodeaux

Title: Project Manager

Organization: LDEQ

Telephone No.: (225) 219-3225

E-Mail: Todd.Thibodeaux@la.gov

Street Address: PO Box 4314

City, State, Zip: Baton Rouge, LA 70821-4314

Survey Questions

1. What is your general impression of the work conducted at the site since the first Five-Year Review period (since July 2002)?

My general impression is good. The Dept. has been notified when GW sampling was to be performed. The sampling was performed in a timely and professional manner.

2. What effect have site operations had on the surrounding community since the first Five-Year Review?

None that I'm aware of.

3. In the past five years, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)

Site Name: PAB Oil and Chemical Services, Inc.

EPA ID No.: LAD980749139

Location: Abbeville, Louisiana

Date: 3/12/2007

Todd Thibodeaux Survey Questions (Cont.)

4. Are you aware of any events, incidents, or activities at the site in the past five years such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.

On a site inspection in 2005 I did notice that someone has unscrewed the gate hinges from the post they were attached to. The gate was laid down and unbroken. I didn't notice any damage done to the monitor wells.

I contacted Tom Vrenick with Aquaterra (one of the PRP's consultants) about the gates. On my next site inspection the gate had been re-attached.

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

Yes

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

If hasn't already been done, the site could use mowing. Also there are low areas in the backfill of the old saltwater pond. They hold water and could be filled with fresh backfill.

Attachment 7

Site Inspection Photographs



Photograph No. 1

Description: Entrance gate into site with warning sign

Site: PAB site

Date: March 28, 2007



Photograph No. 2

Description: Access road into site

Site: PAB site

Date: March 28, 2007



Photograph No. 3

Description: Nested monitoring wells MW-1 and MW-2

Site: PAB site

Date: March 28, 2007



Photograph No. 4

Description: Monitoring well MW-8

Site: PAB site

Date: March 28, 2007



Photograph No. 5
Description: Animal burrow under MW-8 well pad

Site: PAB site
Date: March 28, 2007



Photograph No. 6
Description: Cap elevation monument MN-3

Site: PAB site
Date: March 28, 2007



Photograph No. 7

Site: PAB site

Description: View of site's cap (looking east)

Date: March 28, 2007



Photograph No. 8

Site: PAB site

Description: View of backfilled former saltwater pond

Date: March 28, 2007



Photograph No. 9 Site: PAB site
Description: Low area at the former saltwater pond location Date: March 28, 2007



Photograph No. 10 Site: PAB site
Description: Fence breach/trespassing from south properties Date: March 28, 2007