SECOND FIVE-YEAR REVIEW REPORT FOR COMBUSTION, INC. SUPERFUND SITE LIVINGSTON PARISH, LOUISIANA

February 2016

Prepared By:
United States Environmental Protection Agency
Region 6
Dallas, Texas

Second Five-Year Review Report
Combustion, Inc. Superfund Site
EPA ID#LAD072606627
Livingston Parish, Louisiana

This memorandum documents the United States Environmental Protection Agency's performance, determinations, and approval of the Combustion, Inc. Superfund Site second five-year review under Section 121 (c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. Code § 9261 (c), as provided in the attached Second Five-Year Review Report.

Summary of the Second Five-Year Review Findings

The site remedy consists of short-term removal actions and long-term remedial actions. The long-term remedial actions include phytoremediation with monitored natural attenuation (MNA), long-term monitoring, institutional controls and a hot-spot treatment contingency remedy. Backfill, a clay cap and engineering controls eliminate the potential for human or ecological exposure. Institutional controls are in place to restrict use of site groundwater and limit site use to industrial purposes. However, toxicity values have become more stringent for several site contaminants of concern (COCs) in groundwater, cleanup goals used during the removal actions at the former Process Area may no longer be protective if the former Process Area were to be redeveloped, and volatile groundwater contaminants exceed EPA's vapor intrusion screening levels (VISLs) in the former Process Area.

Actions Needed

The remedy for the site is currently protective. In order for the remedy to be protective in the long term, the following actions must be taken: determine if groundwater remedial goals for the aromatic amine 2,4/2,6-toluenediamine (TDA) and 1,1-dichloroethane need to be revised based on current toxicity information; and determine if Site contaminant conditions require re-evaluation prior to any future redevelopment of the former Process Area involving disturbance of subsurface soil or building of enclosed structures.

Determination

I have determined that the selected remedy for the Combustion, Inc. Superfund Site is currently protective of human health and the environment in the short term. For the remedy to be protective in the long term, the action items identified in the five year review should be addressed.

Pam Phillips, Acting

Carl E. Edlund, P.E.
Director, Superfund Division
U.S. Environmental Protection Agency, Region 6

1/14/16

Date

CONCURRENCES

FIVE-YEAR REVIEW
Combustion, Inc. Superfund Site
EPA ID# LAD072606627

By: _____ Date: 12/16/15
Brian Mueller, U.S. EPA
Remedial Project Manager

By: _____ Date: 12/17/15
Blake Atkins, U.S. EPA
Chief, Louisiana/New Mexico/Oklahoma Section

By: _____ Date: 12/23/15
John C. Meyer, U.S. EPA
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By: _____ Date: 01/11/16
for Joseph Compton, U.S. EPA
Attorney, Office of Regional Counsel

By: _____ Date: 01/11/16
Mark Peycke, U.S. EPA
Chief, Superfund Branch, Office of Regional Counsel

By: _____ Date: 1/14/16
Pamela Phillips, U.S. EPA
Deputy Director, Superfund Division

Table of 2016 Five-Year Review Issues and Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Groundwater is currently protective. The toxicity values for 2,4/2,6 toluenediamine (TDA) and 1,1-dichloroethane have changed and should be evaluated to ensure that the remedy is protective in the long term.	Evaluate whether cleanup goals should be revised for TDA and 1,1-dichloroethane to reflect current toxicity values. If so, include the revisions in a decision document.	LDEQ/EPA	LDEQ/EPA	2/11/2017	No	Yes
The subsurface soil cleanup is currently protective. The subsurface soil cleanup goals used during removal actions should be evaluated for future industrial or residential land uses at the former Process Area. In addition, volatile organic compounds (VOCs) in the former Process Area groundwater exceed EPA's vapor intrusion screening levels (VISLs).	Re-evaluate Site contaminant conditions prior to any reuse of the former Process Area that may disturb subsurface soil or involve building of enclosed structures and include this as a requirement in a decision document.	PRP	LDEQ/EPA	2/11/2017	No	Yes

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LIST OF ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
ASTS	Aboveground Storage Tanks
CFR	Code of Federal Regulations
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
Cis-DCE	Cis-1,2-Dichloroethene
COC	Contaminant of Concern
EDC	Ethylene dichloride (also known as 1,2-DCA)
EDMS	Electronic Document Management System
EPA	United States Environmental Protection Agency
ERA	Expedited Removal Action
FSP	Field Sampling Plan
FYR	Five-Year Review
GMUC	Groundwater Migration Under Control
GPRA	Government Performance and Results Act
HEPR	Human Exposure Controlled and Protective Remedy in Place
HI	Hazard Index
IC	Institutional Control
LDEQ	Louisiana Department of Environmental Quality
UBWZ	Lower Water-Bearing Zone
MCL	Maximum Contaminant Level
µg/L	Microgram per Liter
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
MNA	Monitored Natural Attenuation
MO-1	Management Option 1
NCP	National Contingency Plan
NPL	National Priorities List
ND	Not Detected
OU	Operable Unit
O&M	Operation and Maintenance
ORC	Oxygen Release Compound
PCB	Polychlorinated Biphenyl
PCOR	Preliminary Close-Out
PRP	Potentially Responsible Party
PW	Former Process Area Well
RECAP	Risk Evaluation/Corrective Action Program
ROD	Record of Decision
RSL	Regional Screening Level
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RG	Remedial Goal
RI/FS	Remedial Investigation/Feasibility Study
RPM	Remedial Project Manager
TBC	To-Be-Considered

TDA	2,4/2,6-Toluenediamine
TSCA	Toxic Substances Control Act
UBWZ	Upper Water-Bearing Zone
USTS	Underground Storage Tanks
SVOC	Semi-Volatile Organic Compound
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The Combustion, Inc. Superfund site (the Site) is located in Livingston Parish, about 3 miles northeast of Denham Springs, Louisiana. A waste oil recycling facility operated at the Site from the late 1960s until the early 1980s. Site operations included oil reclamation and wastewater treatment, which released liquid and sludge wastes. These wastes contaminated soil and groundwater with volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The United States Environmental Protection Agency proposed the Site for inclusion on the Superfund program's National Priorities List (NPL) in June 1986. The Site was re-proposed in June 1988 and listed on the NPL in August 1990.

The Louisiana Department of Environmental Quality (LDEQ) initially evaluated the Site as three operable units (OUs), including a Source Control OU (the Soil OU), a Management of Migration OU (Groundwater OU), and an Other Off-Site Areas OU (Off-Site OU). Removal actions between 1992 and 1993 eliminated unacceptable health risks associated with soil, surface water, sludge and waste for future industrial workers and future residents in the Soil OU. Based on the 1997 remedial investigation, LDEQ and EPA determined that no remedial action was warranted for the Off-Site OU. LDEQ selected a long-term remedy that addresses the Site as one OU (Site-Wide OU) in a 2004 Record of Decision (ROD). Cleanup included phytoremediation with monitored natural attenuation (MNA), long-term monitoring, institutional controls and a hot-spot treatment contingency remedy. Because the removal actions and remedial actions left contamination in place above levels that allow for unlimited use, the ROD requires five-year reviews (FYRs). The triggering action for this FYR was the signing of the previous FYR on February 11, 2011.

The remedy at the Site is currently protective of human health and the environment because institutional controls are in place to restrict use of site groundwater and restrict the Site for industrial uses. In addition, residual subsurface soil contamination is under a clean backfill clay cap and engineering controls prevent site access. In order for the remedy to be protective in the long term, the following actions must be taken:

- Determine if groundwater remedial goals for 2,4/2,6-toluenediamine (TDA) and 1,1-dichloroethane need to be revised and if so, include the revisions in a decision document.
- Determine if site contaminant conditions require re-evaluation prior to any future reuse of the former Process Area involving disturbance of subsurface soil or building of enclosed structures and if so, include this requirement in a decision document.

The remedy at the Site is making a visible difference for the quality of life in the local community and nearby environment. In addition to protecting human health and the environment, the remedy at the former Process Area visually enhances the area as a result of the large-scale tree plantings and on-going site upkeep and maintenance. The remedy at the former Pond Area visually enhances the nearby area through regular mowing and site upkeep. In addition, the former Pond Area serves as part of a utility corridor for power transmission lines.

Government Performance and Results Act (GPRA) Measures Review

As part of this FYR, the GPRA Measures have also been reviewed. The GPRA Measures and their status are as follows:

Environmental Indicators
Human Health: Human Exposure Controlled and Protective Remedy in Place (HEPR)
Groundwater Migration: Groundwater Migration under Control (GMUC)

Sitewide Ready for Anticipated Use
The Site achieved Sitewide Ready for Anticipated Use status on September 20, 2007.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Combustion, Inc.		
EPA ID: LAD072606627		
Region: 6	**State:** LA	**City/County:** Livingston Parish
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA **If "Other Federal Agency" selected above, enter Agency name:** Click here to enter text.		
Author name: Brian Mueller, with additional support provided by Skeo Solutions		
Author affiliation: EPA Region 6		
Review period: 6/11/2015 – 2/11/2016		
Date of site inspection: 7/23/2015		
Type of review: Statutory		
Review number: 2		
Triggering action date: 2/11/2011		
Due date *(five years after triggering action date)*: 2/11/2016		

FIVE-YEAR REVIEW SUMMARY FORM (CONTINUED)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
Off-Site OU and Soil OU

Issues and Recommendations Identified in the Five-Year Review:

OU(s): Site-Wide OU	Issue Category: Remedy Performance			
	Issue: The groundwater is currently protective. The toxicity values for 2,4/2,6 toluenediamine (TDA) and 1,1-dichloroethane have changed, which could result in cleanup goals that are not protective.			
	Recommendation: Evaluate whether cleanup goals should be revised for TDA and 1,1-dichloroethane to reflect current toxicity values or drinking water criteria.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/State	EPA/State	2/11/2017

OU(s): Site-Wide OU	Issue Category: Remedy Performance			
	Issue: The subsurface soil cleanup is currently protective. However, the subsurface soil cleanup goals used during removal actions may no longer be protective for future industrial or residential land uses at the former Process Area. In addition, volatile organic compounds (VOCs) in the former Process Area groundwater exceed EPA's vapor intrusion screening levels.			
	Recommendation: Re-evaluate Site contaminant conditions prior to any reuse of the Process Area that may disturb subsurface soil or involve building of enclosed structures.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA/State	2/11/2017

FIVE-YEAR REVIEW SUMMARY FORM (CONTINUED)

Sitewide Protectiveness Statement	
Operable Unit: Site-Wide OU	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy at the Site is currently protective of human health and the environment because ICs are in place to restrict use of site groundwater and restrict the Site for industrial uses. In addition, residual subsurface soil contamination is beneath clean backfill and a clay cap, and engineering controls prevent site access. In order for the remedy to be protective in the long-term, the following actions must be taken: 1) determine if groundwater remedial goals for TDA and 1,1-dichloroethane need to be revised and if so include the revisions in a decision document and 2) determine if site contaminant conditions require re-evaluation prior to any future reuse of the former Process Area involving disturbance of subsurface soil or building of enclosed structures and, if so, include this requirement in a decision document.	

Second Five-Year Review Report
for
Combustion, Inc. Site

1.0 Introduction

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

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

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

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

EPA Region 6, with contractor support from Skeo Solutions, conducted the FYR and prepared this report regarding the remedy implemented at the Combustion, Inc. Superfund site in Livingston Parish, Louisiana. EPA conducted this FYR from June 2015 to February 2016. The Louisiana Department of Environmental Quality (LDEQ) is the lead agency for developing the remedy for the potentially responsible party (PRP)-led cleanup at the Site. EPA, as the support agency, has reviewed all supporting documentation and provided input to LDEQ during the FYR process.

This is the second FYR for the Site. The triggering action for this statutory review is the previous FYR. The FYR is required because hazardous substances, pollutants or contaminants remain at

the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit (OU). This FYR report addresses the Site-Wide OU.

2.0 Progress Since the Last Five-Year Review

The protectiveness statement from the Site's 2011 FYR stated:

Based on the information available during the first FYR, the selected remedy for the Combustion Inc. site is currently performing as intended. The remedy is considered protective because institutional controls (ICs) are in place; therefore, there are no current or potential exposures. The recommendations and follow-up actions identified in this FYR process should be addressed or continued for long-term remedy protectiveness of human health and the environment until remedial action objectives (RAOs) are met.

The 2011 FYR included 13 issues and recommendations. This report summarizes each recommendation and its current status below.

Table 1: Progress on Recommendations from the 2011 FYR

Recommendation Number from 2011 FYR	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
2.1	Implementation of the Hot Spot Treatment Contingency remedy as described in the ROD is not necessary.	PRP	2011	No action warranted at this time. Ongoing annual reports support that hot spot treatment is not warranted	2/11/2011
2.2	Monitor the lower water-bearing zone for all contaminants of concern (COCs) prior to each Five-Year Review (FYR) to verify vertical contaminant migration is not occurring.	PRP	2016	Completed. The 2015 Annual Remedy Effectiveness Report for Year 10 of Remedy Implementation demonstrated all analytes were below detection or ROD cleanup goals. Detection limits were below ROD cleanup goals.	8/31/2015
2.3	Continue monitoring for all COCs semiannually and include trend graphs and plume delineation figures for all parent COCs.	PRP	Annually	Completed and ongoing on an annual basis. The Annual Remedy Effectiveness Reports from 2011 through 2015 evaluate the expanded list of parent contaminants, including trend graphs and plume delineation figures.	8/31/2015
2.4	The 2011 FYR duplicated recommendation 2.3.				
2.5	Coordinate with the laboratory to obtain lower detection limits below cleanup levels.	PRP	Annually	Completed and ongoing on an annual basis. The Annual Remedy Effectiveness Reports from 2010 through 2015 summarize detection limits and report that detection limits are consistently below remedy cleanup goals.	8/31/2015
2.6	Sap flow monitoring, tree core monitoring, and water level monitoring will continue to be implemented according to the schedule presented in the December 2005 Field Sampling Plan in order to document that phytoremediation continues to extract and degrade COCs.	PRP	Annually	Completed as outlined in the 2013 Field Sampling Plan that implemented recommendations from the 2011 FYR report.	11/6/2013
2.7	Continue monitoring monitored natural attenuation (MNA) biochemical parameters and reporting results prior to each FYR.	PRP	2016	Completed and ongoing on an annual basis.	8/31/2015
2.8	Rhizosphere sampling, transpiration gas, and tree stand health indicators should not be continued. However, tree stands should be visually inspected during site maintenance work by the arborist to verify continued tree growth and overall health.	PRP	2011	Completed as outlined in the 2013 Field Sampling Plan that implemented recommendations from the 2011 FYR report.	11/6/2013

Recommendation Number from 2011 FYR	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
2.9	Determine if the use of the BIOSCREEN and BIOCHLOR screening models presented in each annual report is necessary during the next FYR	PRP	Annually	Completed as outlined in the 2013 Field Sampling Plan that implemented recommendations from the 2011 FYR report.	11/6/2013
2.10	Determine if the Buscheck and Alcantar rate constant methodology should be used to evaluate contaminant degradation.	PRP	Annually	Completed and ongoing on an annual basis. The Buscheck and Alcantar rate constant methodology is no longer applicable at the Site and has been discontinued in accordance with the October 2014 revised Field Sampling Plan (FSP).	8/31/2015
2.11	Continue monitoring cis-1,2-dichloroethene (cis-DCE) and report in each annual report to document continued attainment of both the maximum contaminant level (MCL) and Record of Decision (ROD) cleanup level.	PRP	Annually	Completed and ongoing on an annual basis. Cis-DCE concentrations are monitored and reported in the annual reports. Concentrations are lower than the ROD cleanup level and the MCL.	8/31/2015
2.12	Determine the necessity for evaluating the vapor intrusion exposure pathway.	PRP	2016	Completed. The 2015 Remedy Effectiveness report evaluated the indoor pathway. The report supports the need for continued use of institutional controls at the former Process Area due to several volatile organic compounds (VOCs) above EPA's vapor intrusion screening levels (VISLs).	8/31/2015
2.13	Continue to update, review, and evaluate whether the ROD cleanup levels continue to be appropriate based on new toxicity information.	PRP	2016	Completed. This FYR determined that toxicity values for drinking water standards have become more stringent for cis-DCE; 2,4/2,6-toluenediamine (TDA) and 1,1-dichloroethane. Groundwater restrictions remain in place, but revising cleanup goals to reflect the more stringent toxicity values is recommended to ensure monitoring reflects remedy effectiveness. Despite an MCL for cis-DCE that is more stringent than the cleanup goal, the long-term monitoring data demonstrate that all concentrations are below the current MCL and below detection in the sentinel well.	7/6/2015

3.0 Five-Year Review Process

3.1 Administrative Components

EPA Region 6 initiated the FYR in June 2015 and scheduled its completion for February 2016. EPA remedial project manager (RPM) Brian Mueller led the EPA site review team, which also included contractor support provided to EPA by Skeo Solutions. In June 2015, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

3.2 Community Involvement

In November 2015, EPA published a public notice in the *Livingston Parish News* announcing the commencement of the FYR process for the Site, providing EPA contact information and inviting community participation. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. EPA will place copies of the document in the designated site repositories for the Site: the Livingston Parish Library in Denham Springs, LA; the LDEQ office in Baton Rouge, Louisiana; and EPA Region 6 office in Dallas, Texas. Upon completion of the FYR, EPA will place a public notice in the *Livingston Parish News* to announce the availability of the final FYR Report in the Site's document repository.

3.3 Document Review

A summary of existing Site information to include chronology of environmental response activities, environmental setting and remedial actions is presented in Appendix A. This section evaluates any changes in Applicable or Relevant and Appropriate Requirements (ARARs) and institutional controls since the previous FYR.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. In performing the FYR for

compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater ARARs
According to the 2004 ROD, the chemical-specific ARARs for the Site's groundwater contaminants of concern (COCs) are the maximum contaminant levels (MCLs) specified under the Safe Drinking Water Act. In the absence of an MCL, the ROD listed the Louisiana Risk Evaluation/Corrective Action Program (RECAP) (EPA 2004a) as a to-be-considered (TBC) standard. This review compared current federal MCLs to those used in the 2004 ROD for the groundwater COCs. Except for cis-1,2-dichloroethene (cis-DCE), ARARs for the Site's groundwater have not changed or have become less stringent (Table K-1). The cleanup level for cis-DCE is 0.518 mg/L, which is significantly higher than the current MCL of 0.07 mg/L. See Appendix K for additional ARAR review information. Long-term monitoring data for this FYR indicate that cis-DCE continues to be below the current MCL and below detection in the sentinel wells (see Section 3.4).

Institutional Control Review

The 2004 ROD required that the PRP group, referenced herein after as the PRPs, implement institutional controls in the form of conveyance notices. These notices inform the public of site conditions and place restrictions on former Pond Area soils and the former Pond and Process Area groundwater. In 2006, the PRPs filed conveyance notifications restricting land use at the former Pond and Process Areas to industrial/commercial use. However, the conveyances for the former Process Area do not restrict disturbing soil. The notifications also restrict any use of groundwater in these areas. The PRPs ensure the fence around both areas is intact and locked to restrict access. The PRPs ensure that warning signs with emergency contact numbers are visible and legible regarding the presence of a Superfund site.

The Clerk of the Court for Livingston Parish recorded the notices on June 14, 2006, which can be accessed at the LDEQ electronic data management system (EDMS) as document identification number 5559001 at http://edms.deq.louisiana.gov/app/doc/querydef.aspx. LDEQ is responsible for enforcing and monitoring the institutional controls in accordance with Louisiana Rev. Stat. Ann. §30:2039 (2000) and La. Admin. Code tit. 33 Part 5 §3525 (2002). In addition, the PRPs enforce these institutional controls through site monitoring and continued operation and maintenance work.

No future land uses for the Site have been established or are anticipated that would require an adjustment to the institutional controls; however, additional controls may be warranted to prevent exposures to contaminated subsurface soils or exposures to indoor air if structures were to be constructed on the Site.

Table 3 lists the property conveyances for each parcel owned by Combustion, Inc. Site Remediation Group, LLC. Figure 1 shows property boundaries for parcels at the Site with institutional controls with an overlay of the 2,4/2,6-toluenediamine (TDA) and ethylene dichloride (EDC) contaminant plumes. Appendix H shows tracts of land that correspond to each parcel in the former Process Area and Pond Areas in Figures H-1 and H-2, respectively.

Table 2: Institutional Control (IC) Summary Table

Parcel Number(s)[a]	Area of Interest[a]	Contaminated Media	ICs Needed?	ICs required by ROD?	IC Objective[b]	IC Instrument in Place/Notes[b]
Former Pond Area						
264085	6.28 acres Section 22-6-3 (part of 7.88 acres) Tract A	Soil	Yes	Yes	Restrict to industrial/commercial use and restrict disturbing soil	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 908)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
Former Process Area						
265085	Lot 36 Dubose Subdivision from Combustion Inc. Tract A	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 902)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
264085	1.60 acres Section 22-6-3 (part of 7.88 acres) Tract B	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 926)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
257428	0.29 acres Section 22-6-3 Tract C	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 914)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
283895	Tract A containing 1.23 acres Section 22-6-3 Tract D	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 920)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
269951	2 acres in NE/2 of SW/4 Section 22-6-3 Tract E	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 932)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
269951	1.93 acres Section 22-6-3 Tract F	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 938)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
267054	4 acres Section 22-6-3	Soil	Yes	Yes	Restrict to industrial/commercial use	

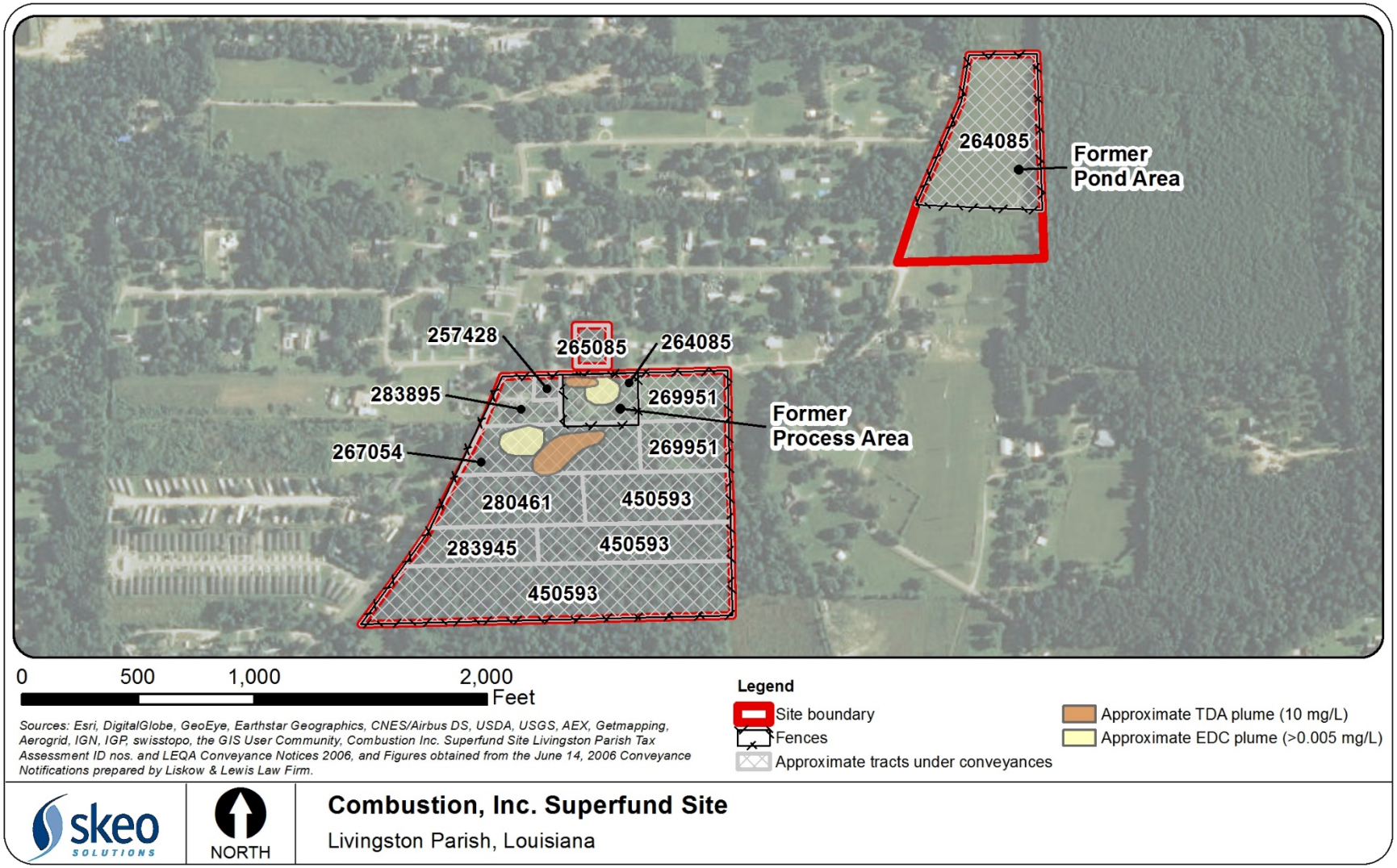
Parcel Number(s)[a]	Area of Interest[a]	Contaminated Media	ICs Needed?	ICs required by ROD?	IC Objective[b]	IC Instrument in Place/Notes[b]
	Tract G	Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 974)
280461	Lot 3-A containing 3 acres Section 22-6-3 Tract H	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 944)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
283945	Tract A containing 2 acres Section 22-6-3 Tract I	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 950)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
450593	8.82 acres from C Section 22-6-3 Tract J	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 956)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
	3.11 acres from C Section 22-6-3 Tract K	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 962)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	
	Lot 3-B 3.15 acres Section 22-6-3 Tract L	Soil	Yes	Yes	Restrict to industrial/commercial use	Conveyance notification recorded on 6/14/2006 (Book: 934 and Page: 968)
		Groundwater	Yes	Yes	Prohibit disturbing remedy or using groundwater	

Notes:

a. Information provided by Liskow & Lewis, legal counsel for Combustion, Inc. Site Remediation Group, LLC received via email on 8/3/2015.

b. Information obtained from property conveyances obtained from LADEQ EDMS file number 5559001 for AI# 2941 http://edms.deq.louisiana.gov/app/doc/querydef.aspx (accessed 8/10/15).

Figure 1: Site Land Parcels and Associated Restrictions



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

3.4 Data Review

The following sections summarize the 2011 to 2015 annual monitoring reports which evaluate effectiveness of the groundwater remedy of phytoremediation and natural attenuation downgradient of the former Process Area. In the 2010 Annual Remedy Effectiveness Report, the PRPs requested a finding of No Further Action – At This Time for the former Pond Area groundwater and requested that this portion of the Site be deleted from the NPL. EPA did not grant the request. EPA required one more round of groundwater data from the former Pond Area to support the partial deletion effort for this portion of the Site. This data review also summarizes the 2015 groundwater data collected from the former Pond Area which EPA will evaluate in considering this area for deletion.

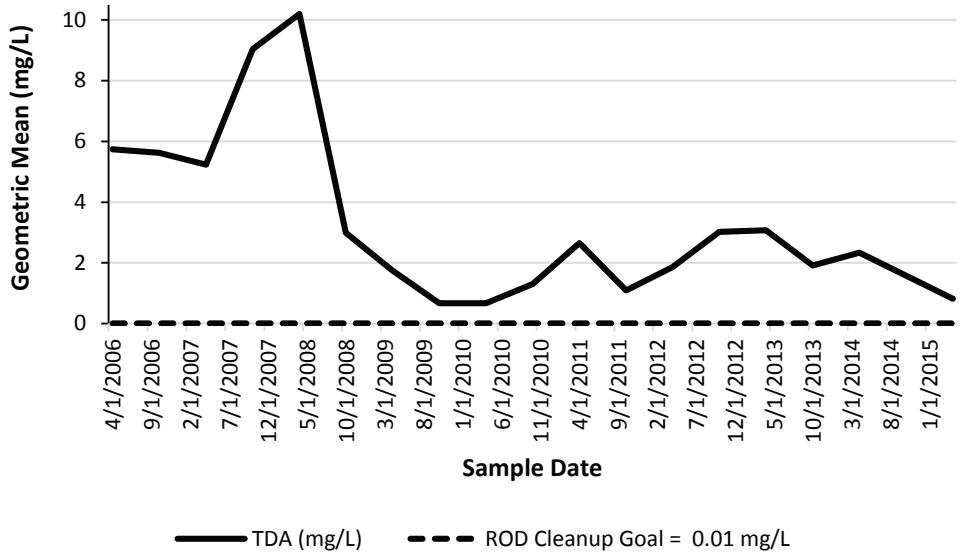
Former Process Area

Although the annual monitoring reports focus on 2,4/2,6-Toluenediamine (TDA) and 1,2-dichloroethane (also referred to as ethylene dichloride (EDC)), groundwater was sampled for all site COCs, including parent and daughter products for volatile and semi-volatile fractions in both the lower and upper water-bearing zones. Monitoring well locations are shown in Appendix G (Figure G-1). EDC is the tracking contaminant for the chlorinated VOCs; TDA is the tracking contaminant for the aromatic amines. The behavior of these tracking contaminants should be representative of the behavior of similar compounds at the Site. The 2004 ROD interim remedial goal of 10 percent reduction in mean concentration of tracking contaminants was met by the PRPs, as documented in the 2011 FYR. The geometric mean concentration is still used to evaluate concentration trends over time.

Since the remedy was constructed in 2006, long-term concentration trend graphs for TDA and EDC in the upper water-bearing zone monitoring wells show a generalized downward trend in contaminant concentrations. The lowest TDA concentrations occurred from October 2009 to April 2010 (Figure 2). Figure 2 shows that geometric mean concentrations have fluctuated some since that time but are significantly below levels observed right after remedy construction. From April 2010 to 2015, TDA and toluidine concentrations gradually increased in PW01 and PW01S, in the former Process Area (Appendix G, Figure G-2 and G-3, respectively). Historic highs of aromatic amines and hydrocarbons were observed in PW01 in 2014 with a concentration of 0.138 mg/L and in PW01S in 2015 with concentrations of 0.066 mg/L. The PRPs report that short-term fluctuations in groundwater quality during the last five years are likely related to precipitation or drought, groundwater mounding, and surface soil disturbance during tree planting. The PRPs report that contaminant mass in soil continues to decline as evidenced by decreasing geometric mean concentrations, reduction in the plume footprints and monitored natural attenuation (MNA) measurements. Plume maps in the 2015 annual report indicate the TDA and EDC plumes have shrunk since 2006 (Appendix G, Figure G-4 and Figure G-5, respectively). This indicates that the remedy is functioning as intended. Due to increasing aromatic amine concentrations in the two Process Area wells, it is recommended that the groundwater monitoring program continue in the former Process Area to determine if optimization is warranted, or whether MNA will achieve groundwater cleanup goals in a reasonable timeframe. Due to the elevated concentrations of TDA in former Process Area well 1

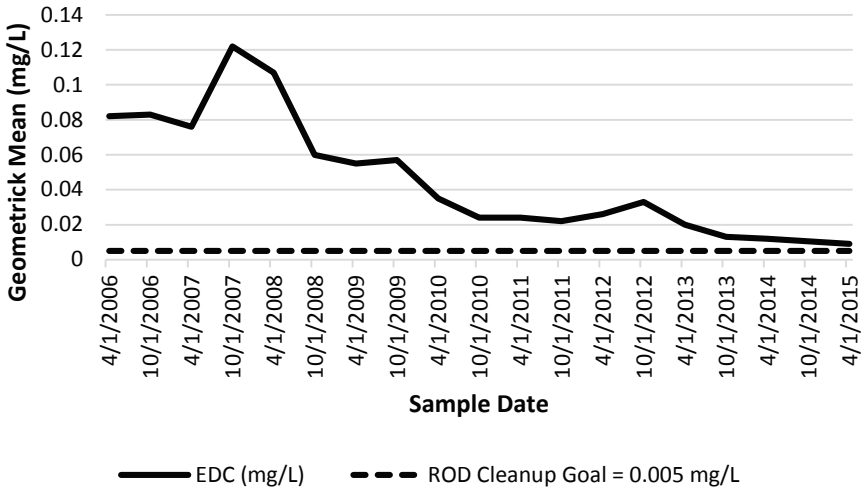
(PW-01) and PW-01S, inclusion of PW-07 and PW-11 should be considered for inclusion in the monitoring program to further characterize the western extent of the plume.

Figure 2: Geometric Mean Concentrations of TDA between 2006 and 2015



Long-term and short-term (last five years) geometric mean EDC concentrations continued to decline in the upper water-bearing zone (Figure 3) since 2006. The lowest concentrations were in 2014 (0.012 mg/L) and 2015 (0.009 mg/L), but the geometric mean concentrations have not met the cleanup goal of 0.005 mg/L. In 2015, just two of the upper-water bearing zone wells reported EDC above the cleanup goal: PW-08 at 1.62 mg/L and PW-06 at 0.0152 mg/L

Figure 3: Geometric Mean Concentrations of EDC between 2006 and 2015



Groundwater data from the lower water-bearing zone shows detections of several chlorinated organic compounds near the detection limit and below the cleanup goals during the FYR period. This demonstrates that vertical migration of COCs from the upper water-bearing zone is not occurring. MNA appears to be occurring based on decreasing geometric mean concentrations, reduction in plume footprint, and measurement of MNA indicators to evaluate spatial reduction/oxidation conditions (e.g., dissolved oxygen and oxidation-reduction potential). The 2015 monitoring report demonstrate significant shrinkage in all COC plumes monitored at the Site; Appendix G provides a time-series of plume maps.

The cleanup level for cis-1,2-DCE (0.518 mg/L) is significantly higher than the MCL (0.07 mg/L). Cis-DCE concentrations are consistently well below the MCL; the highest reported concentration in 2015 was 0.0103 mg/L. In addition, there have been no cis-1,2-DCE detections in the sentinel or lower water-bearing zone wells.

Former Pond Area

PRPs sampled groundwater at the former Pond Area during the 1989 Preliminary Remedial Investigation (RI), the 1995 Phase II RI, and the 2010 FYR. In 2010, the PRPs completed a risk evaluation of groundwater contaminants in Zone 1 (upper zone) and Zone 2 (lower zone). Results for both zones were below RECAP standards.

In July 2014, the PRPs submitted a document titled, "*Former Pond Area Request for Partial Delisting*" to LDEQ and EPA. This document contains all historical analytical data and hydrogeological data collected in the former Pond Area. The RECAP evaluation in the delisting document demonstrated that constituent concentrations in Zone 1 and Zone 2 groundwater in the former Pond Area meet LDEQ RECAP health-based cleanup levels. EPA requested an additional round of Zone 1 and 2 groundwater sampling. The additional sampling was performed in April 2015. The RECAP evaluation in the 2015 annual remedy effectiveness report demonstrated that the former Pond Area Zone 1 and 2 groundwater meets the LDEQ RECAP health-based screening levels. This FYR also compared the 2015 groundwater results to EPA's tap water Regional Screening Levels (RSLs) (Table 3); the only contaminant detected in Zone 2 was acetone. Acetone is a common laboratory contaminant and was detected at higher concentrations in Zone 1. As shown in Table 3, the screening-level risk evaluation shows that the cumulative risk is within EPA's risk management range of 1×10^{-4} to 1×10^{-6} and the cumulative noncancer hazard index (HI) is below EPA's threshold of 1.0 for residential exposure.

Table 3: Evaluation of 2015 Former Pond Area Groundwater COC Concentrations

COC	Maximum Detection in Zone 1 or 2[a] (µg/L)	Frequency of Detection Zone 1 and 2	Residential RSLs (µg/L)[b]		Screening-Level Risk Evaluation[c]	
			Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI
EDC	0.59	1/11	0.17	13	4×10^{-6}	0.04
Acetone	7.74	3/11	NA	14,000	NA	0.001
Benzene	4.84	4/11	0.45	33	1×10^{-5}	0.15
Chlorobenzene	2.54	1/11	NA	78	NA	0.03
Cis-DCE	0.476	1/11	NA	36	NA	0.01
Methyl ethyl ketone	1.03	1/11	NA	5,600	NA	0.0002
Vinyl chloride	0.477	1/11	0.019	44	2×10^{-5}	0.01

COC	Maximum Detection in Zone 1 or 2[a] (µg/L)	Frequency of Detection Zone 1 and 2	Residential RSLs (µg/L)[b]		Screening-Level Risk Evaluation[c]	
			Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI
				Totals	4×10^{-5}	0.2

Notes:
a. Concentrations from Table A-4 and A-5 of the 2015 Annual Remedy Effectiveness Report.
b. Values are EPA's tap water RSL for carcinogenic and noncancer effects, available at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm (accessed 9/10/15)
c. Screening level risk evaluation:
Risk = (Maximum concentration/RSL)(1×10^{-6})
HI = (Maximum concentration/RSL)
µg/L – microgram per liter
RSL – Regional Screening Level
NA not applicable because chemical has not been classified as a carcinogen.

3.5 Site Inspection

A site inspection took place on July 23, 2015. Site inspection participants included Brian Mueller (EPA Region 6 RPM), Todd Thibodeaux (LDEQ), Carlton Todd (PRPs contractor), William Hurdle (O&M contractor), Tim Kuylen (Livingston Parish Office of Homeland Security and Emergency Preparedness) and Eric Marsh and Claire Marcussen (Skeo Solutions).

The PRPs divided up the Site into tracts of land termed A through L (Figure H-1), which were used for planning where stands of trees would be planted. The site inspection began north of the former Process Area with a tour of Tract A; this tract represents the reference location for phytoremediation where trees were planted in an area not impacted by Site contamination. The tour continued at the former Pond Area, which is a flat, open grassed field maintained as a power line right-of-way. The tour resumed at the former Process Area, where phytoremediation stands were observed (Tracts B through G). There is a small storage shed for temporary storage of monitoring well purge water at the southern boundary of Tract B. There is a weather station in Tract B to record meteorological information. Trees planted as part of the phytoremediation remedy were in good condition. Several large limbs were removed due to hurricane damage, but new growth was evident. Site inspection participants observed the tree well technology used in a pilot study to encourage deeper root growth. Site inspection participants also observed a stormwater pond near Tract G and crawfish 'chimneys' in several wet grassy areas of the Site. All monitoring wells within the former Pond and Process Areas were closed, secured with locks, clearly labeled, and appeared to be in good condition. A tall fence topped with razor wire, secured with locking gates and posted with emergency phone numbers surrounds the former Pond and Process Areas.

After the site inspection, Skeo Solutions staff reviewed site property records at the Livingston Parish Clerk of Court Denham Springs Branch, at 133 Aspen Square, Suite C, Denham Springs, Louisiana, 70726 and the Livingston Parish Assessor office at 29940 Magnolia Street, Livingston, Louisiana, 70754. Skeo Solutions staff visited the Site's local information repository at Livingston Parish Library, located at 8101 Highway 190, Denham Springs, Louisiana, 70726. Site-related documents were not available for public viewing at the information repository.

Appendix E includes a completed Site Inspection Checklist. Appendix F includes photographs taken during the site inspection.

3.6 Interviews

The FYR process included interviews with parties affected by the Site, including regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. Interview responses were submitted via email. The interviews are summarized below. Appendix D provides the complete interviews.

EPA RPM Brian Mueller indicated that the remedy is effective and no major issues have been identified. EPA is not aware of any impacts on the surrounding community since cleanup was initiated. EPA and the PRPs have a good working relationship. He stated that the recommendations from the previous FYR have been sufficiently addressed and recommends delisting the former Pond Area from the NPL if the groundwater data support delisting.

LDEQ Project Manager Todd Thibodeaux stated that the project is successful so far and the performance of the remedy exceeded his expectations. He also indicated that the recommendations from the 2011 FYR have been sufficiently addressed and he is comfortable with the status of institutional controls at the Site. Mr. Thibodeaux is not aware of any changes in land uses of the area. He has not received any complaints from local residents in the past five years.

William Hurdle of AECOM, the PRP's O&M contractor, indicated that the remedy is proceeding well. Mr. Hurdle reports that constituent concentrations continue to decline on average in the monitoring wells and plume areas continue to shrink. The contaminant concentrations in the groundwater are decreasing. The phytoremediation tree stands are thriving. Mr. Hurdle stated that there is good communication between the regulatory agencies and the PRPs and their contractors. Mr. Hurdle stated that O&M is conducted on a periodic basis as planned. There have been no significant changes in the O&M activities, other than removing fallen trees and staking trees following Hurricane Isaac in 2012 and a severe thunderstorm in April 2015. Mr. Hurdle summarized the recommendations from the 2011 FYR and provided a response for each recommendation, which are summarized in Appendix D.

Mike Pisani, a subcontractor for the PRPs, stated that the remedy is conforming with the ROD and the EPA/LDEQ-approved work plans. Mr. Pisani stated that the tree planting and maintenance of the site grounds are appreciated by the community. He also stated that the groundwater monitoring results support that the former Pond Area can be delisted and that a significant cost savings has been observed by monitoring groundwater on an annual rather than semiannual basis.

Resident 1 was interviewed after the site inspection. The resident was aware of the environmental issues at the Site. Resident 1 stated that the Site is being taken care of and has not had any adverse effects on the local community. The resident was concerned about whether the

Site could impact her groundwater, but learned during the interview that the impacted groundwater has not migrated off site and her source of water is not impacted by the Site.

Resident 2 was interviewed after the site inspection. The resident was aware of the environmental issues at the Site. Resident 2 stated that the Site is being well maintained and has not had any adverse effects on the local community. The resident was pleased with the current conditions of the Site.

4.0 Technical Assessment

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

Yes. The groundwater remedy is functioning as intended. The groundwater plumes continue to shrink over time, vertical contaminant migration to the lower water-bearing zone, Zone 2, is not occurring, and plumes are not migrating. In addition, institutional controls are in place that prevent exposure to groundwater or unrestricted use of the former Pond Area. A fence surrounds the Site to prevent site access. While a generalized declining trend is observed in the geometric mean concentrations of the aromatic amines, an increasing trend for aromatic amines was observed in Process Area wells over the last five years. Thus, it is recommended that groundwater monitoring continue to determine if optimization is warranted or phytoremediation and MNA can achieve remedial goals in a reasonable timeframe.

In 2006, the PRPs filed conveyance notifications restricting land use at the former Pond and Process Area to industrial/commercial use. The notifications also restrict any use of groundwater in these areas and any activities that would impact the remedy. In addition, the notifications require the PRPs to evaluate site conditions before any land use changes in the Process Area. The PRPs ensure the fence around both areas is intact and locked to restrict access. The PRPs ensure that warning signs with emergency contact numbers are visible and legible regarding the presence of a Superfund site.

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

The exposure assumptions used to develop the human health risk assessment are still valid with respect to direct exposure to groundwater. However, indirect exposure to groundwater at the former Process Area by inhalation of VOC vapors in indoor air was not previously addressed in the baseline risk assessment. The PRP completed a vapor intrusion evaluation in the 2014 Annual Remedy Effectiveness Report following LDEQ guidance. The results show that none of the VOCs detected exceeded the LDEQ management option 1 (MO-1) groundwater screening criteria for enclosed spaces under non-industrial buildings. However, several of EPA's vapor intrusion screening levels (VISLs) for groundwater under residential and industrial land use were exceeded (Appendix J). Institutional controls are in place that preclude using the former Process Area for residential purposes and there are no habitable commercial structures in the former Process Area. However, this evaluation confirms the need to conduct a vapor intrusion evaluation using multiple lines of evidence if enclosed structures are to be built on the former

Process Area. Alternatively a vapor barrier/mitigation system could be installed for any new structures, which would eliminate this exposure pathway.

Toxicity values have changed for some of the groundwater COCs, resulting in cleanup goals that may not be stringent enough for potable use of groundwater (Appendix J). The screening-level risk evaluation for the ROD groundwater cleanup goals identifies three groundwater COCs (TDA; 1,1-dichloroethane; and cis-DCE) with cleanup goals equal to either a cancer risk greater than EPA's upper bound of the cancer risk management range (1×10^{-4}) or a noncancer HI greater than 1.0. The groundwater remedy remains protective in the short term because engineering and institutional controls prevent groundwater exposure. In addition, the long-term monitoring data indicate cis-DCE concentrations below the current MCL and below detection in sentinel wells. However, to ensure remedy effectiveness is properly monitored, the cleanup goals for TDA and 1,1-dichloroethane should be re-evaluated to determine if revisions to the cleanup goals are necessary.

A screening-level risk evaluation was conducted on the removal action soil cleanup goals at the former Process and Pond Areas (Appendix J). The evaluation shows that the removal action soil cleanup goals for some of the soil COCs exceed a cancer risk of 1×10^{-4} or a noncancer HI of 1.0 in the former Process and Pond Areas. In addition, the current residential screening level for lead in soil is more stringent than the removal action cleanup goal.

Despite the risk and HI exceedances associated with the removal action cleanup goals for the former Process Area and former Pond Area, the residual contamination in these areas was covered during the 1994 expedited removal action (ERA), when the PRP filled excavated areas with compacted clay and a 6- to 12-inch soil cover. To prevent future human exposures to subsurface soil contamination at the former Pond Area, the PRP filed restrictions in the form of land conveyances that restrict land use in this area to industrial/commercial uses and also restrict disturbing the soil. The PRP also filed land conveyances that limit future land use of the former Process Area to industrial/ commercial and require the PRP to re-evaluate site conditions if future land use changes from industrial to non-industrial. However, because the removal action goals are outdated based on current toxicity information, it is recommended that a decision document require site conditions be re-evaluated before any type of reuse of the former Process Area.

Appendix J includes additional detailed information regarding this FYR's evaluation of exposure assumptions, toxicity data, cleanup levels and RAOs.

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

No other information has come to light that could call into question the protectiveness of the remedy. Potential site impacts from climate changes have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the Site. See Appendix L for additional information.

4.4 Technical Assessment Summary

The review of documents, risk assumptions, toxicity data, cleanup levels and the site inspection indicate that the Site's remedy is functioning as designed. The groundwater plumes continue to shrink over time, vertical contaminant migration to the lower water-bearing zone is not occurring, and plumes are not migrating. In addition, institutional controls are in place that prevent exposure to groundwater and unrestricted use of the former Pond Area. A fence surrounds the Site to prevent site access. Although a generalized declining trend is observed in geometric mean concentrations of aromatic amines, an increasing trend for aromatic amines was observed in Process Area wells over the last five years. Thus, it is recommended that groundwater monitoring continue, to determine if optimization is warranted or phytoremediation and MNA can achieve remedial goals in a reasonable timeframe. Toxicity values have changed for several groundwater COCs, which may result in more stringent groundwater cleanup goals. The groundwater remedy remains protective in the short term because engineering and institutional controls prevent groundwater exposure To ensure that the remedy is protective in the long term, the cleanup goals for TDA and 1,1-dichloroethane should be re-evaluated to determine if revisions to the cleanup goals are necessary. In addition, it is recommended that site contaminant conditions be re-evaluated prior to any redevelopment activities of the Process Area.

5.0 Issues

Table 4 summarizes the current site issues.

Table 4: Current Site Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
Groundwater is currently protective. The toxicity values for 2,4/2,6 -TDA and 1,1-dichloroethane have changed, and should be evaluated to ensure that the remedy is protective in the long term.	No	Yes
The subsurface soil cleanup is currently protective. The subsurface soil cleanup goals should be evaluated for future industrial or residential land uses at the former Process Area. In addition, VOCs in the former Process Area groundwater exceed EPA's VISLs.	No	Yes

6.0 Recommendations and Follow-up Actions

Table 5 provides recommendations to address the current site issues.

Table 5: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Toxicity values for TDA and 1,1-dichloroethane have changed, which could result in cleanup goals that are not protective.	Evaluate whether cleanup goals should be revised for TDA and 1,1-dichloroethane to reflect current toxicity values. If so, include the revisions in a decision document.	EPA and LDEQ	EPA and LDEQ	2/11/2017	No	Yes
The subsurface soil cleanup goals used during removal actions may no longer be protective for future industrial or residential land uses at the former Process Area. In addition, VOCs in the former Process Area groundwater exceed EPA's VISLs.	Re-evaluate site contaminant conditions prior to any reuse of the Process Area that may disturb subsurface soil or involve building of enclosed structures and include this as a requirement in a decision document.	PRP	EPA and LDEQ	2/11/2017	No	Yes

The following additional items, though not expected to affect protectiveness, warrant additional follow up:

- The site repository did not include any documents available for public viewing. It is recommended that a copy of the decision documents and FYR be included for public viewing.

7.0 Protectiveness Statements

The remedy at the Site is currently protective of human health and the environment because institutional controls are in place to restrict use of site groundwater and restrict the Site for industrial uses. In addition, residual subsurface soil contamination is under a clean backfill clay cap and engineering controls prevent site access. In order for the remedy to be protective in the long term, the following actions must be taken:

- Determine if groundwater remedial goals for TDA and 1,1-dichloroethane need to be revised and if so, include the revisions in a decision document.
- Determine if site contaminant conditions require re-evaluation prior to any future reuse of the former Process Area involving disturbance of subsurface soil or building of enclosed structures and if so, include this requirement in a decision document.

8.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: Existing Site Information

A-1.0 Site Chronology

Table A-1 lists the dates of important events for the Site.

Table A-1: Chronology of Site Events

Date	Event
Dubose Oil Company and subsequently Combustion, Inc. operated a used oil reclamation facility at the Site	1960s – 1980s
The Water Pollution Control Division under the State of Louisiana Department of Natural Resources, Office of Environmental Affairs, recommended enforcement action at the Site	February 9, 1983
EPA proposed the Site for listing on the Superfund program's NPL	June 20, 1986
LDEQ and the PRPs reached an initial settlement agreement	April 8, 1987
PRPs completed an Expedited Removal Action (ERA) feasibility evaluation	June 4, 1987
PRPs Technical Committee prepared a remedial investigation/feasibility study (RI/FS) work plan	February 16, 1988
EPA re-proposed the Site for inclusion on the NPL	June 24, 1988
PRPs entered into a RI/FS Agreement with LDEQ	September 27, 1988
PRPs submitted a preliminary remedial investigation report to LDEQ	March 30, 1990
EPA listed the Site on the NPL	August 31, 1990
PRPs entered into agreement with LDEQ to conduct ERAs at the Site	July 14, 1992
PRPs completed ERA site activities	1992 - 1993
EPA and LDEQ approved the RI/FS Work Plan	November 18, 1994
EPA and LDEQ approved the RI report	December 5, 1997
PRPs began a pilot project consisting of planting tree stands A through G	March 2001
PRPs submitted a revised FS report to EPA and LDEQ	September 2001
LDEQ signed the ROD for sitewide groundwater	April 30, 2004
EPA signed the ROD for sitewide groundwater	May 28, 2004
PRPs signed an Remedial Design/Remedial Action (RD/RA) Cooperative Agreement	March 25, 2005
LDEQ conditionally approved the RD work plan	July 15, 2005
Hurricane Katrina occurred	August 29, 2005
Hurricane Rita occurred	September 24, 2005
PRPs submitted the Revised Final Process Area Field Sampling Plan	December 16, 2005
LDEQ approved Process Area Field Sampling Plan	January 23, 2006
LDEQ approved Remedial Action Work Plan	January 26, 2006
PRPs initiated the RA construction	March 31, 2006
PRPs completed the baseline groundwater sampling event and initiated phytoremediation, natural attenuation and monitoring	April 2006
PRPs filed Property Conveyance Notices for registry and recorded in the Clerk of Court's office for Livingston, Parish	June 14, 2006
PRPs completed Year 1 phytoremediation, natural attenuation, and monitoring	October 2006
LDEQ and EPA signed the preliminary close-out report (PCOR)	July 10, 2006
PRPs completed Year 2 phytoremediation, natural attenuation, and monitoring	October 2007
PRPs submitted Remedial Action Year 2 (2007) Annual Monitoring Report	March 17, 2008
PRP submitted 2006 Remedial Action Annual Report	March 15, 2007
Hurricane Gustav occurred	September 1, 2008
Hurricane Ike occurred	September 13, 2008
PRPs completed Year 3 phytoremediation, natural attenuation, and monitoring	October 2008
PRPs submitted Remedial Action Year 3 (2008) Annual Monitoring Report	March 16, 2009
PRPs completed Year 4 phytoremediation, natural attenuation, and monitoring	October 2009
PRPs submitted the 2009 Annual Report Year 4 Remedy Implementation Report	March 15, 2010
PRPs submitted the 2010 Annual Report Year 5 Remedy Implementation Report	August 12, 2010

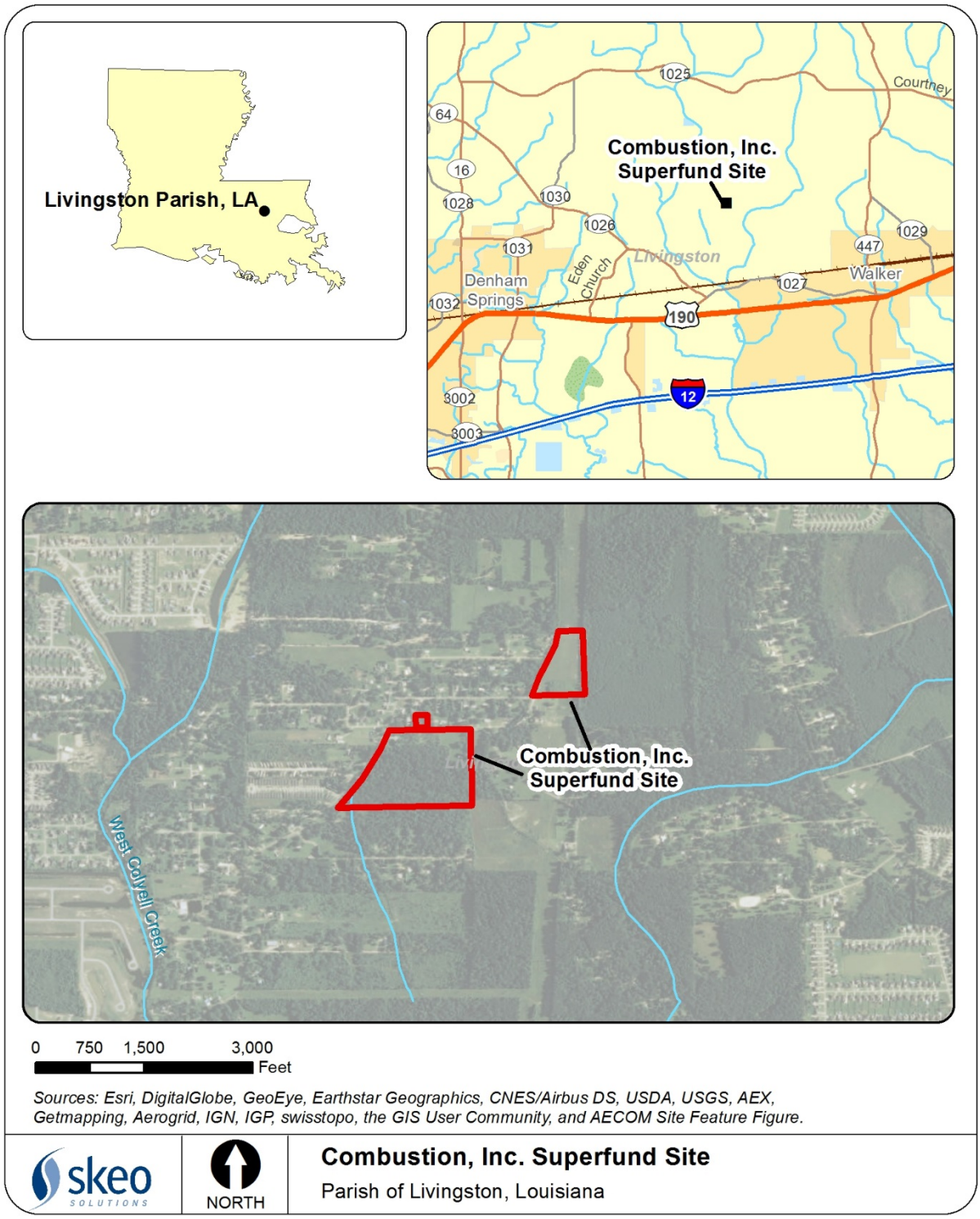
Date	Event
PRPs completed Year 5 phytoremediation, natural attenuation, monitoring	October 2010
EPA signed the First FYR	February 2, 2011
Tropical storm Lee occurred	September 2, 2011
PRPs completed the 2011 Annual Report Year 6 Remedy Implementation Report	March 21, 2012
PRPs replaced well PW-04	April 2, 2012
Hurricane Isaac occurred	August 28, 2012
PRPs expanded the phytoremediation footprint near well PW-08	February 21, 2013
Louisiana Department of Natural Resources approves the PRP Class V injection well permitting waiver	March 2013
PRPs completed the 2012 Annual Report Year 7 Remedy Implementation Report	March 29, 2013
PRPs completed planting additional trees in stand C where trees were missing as a result of hurricanes, winter storms or other damage	April 2013
PRPs completed the 2013 Annual Report Year 8 Remedy Implementation Report	March 14, 2014
PRPs finalized the field sampling plan	October 2014
PRPs submitted a proposal requesting delisting of groundwater at the former Pond Area	July 9, 2014
PRPs completed the 2014 Annual Report Year 9 Remedy Implementation Report	March 11, 2015
PRPs completed the 2015 Annual Report Year 10 Remedy Implementation Report	August 31, 2015

A-2.0 Background

A-2.1 Physical Characteristics

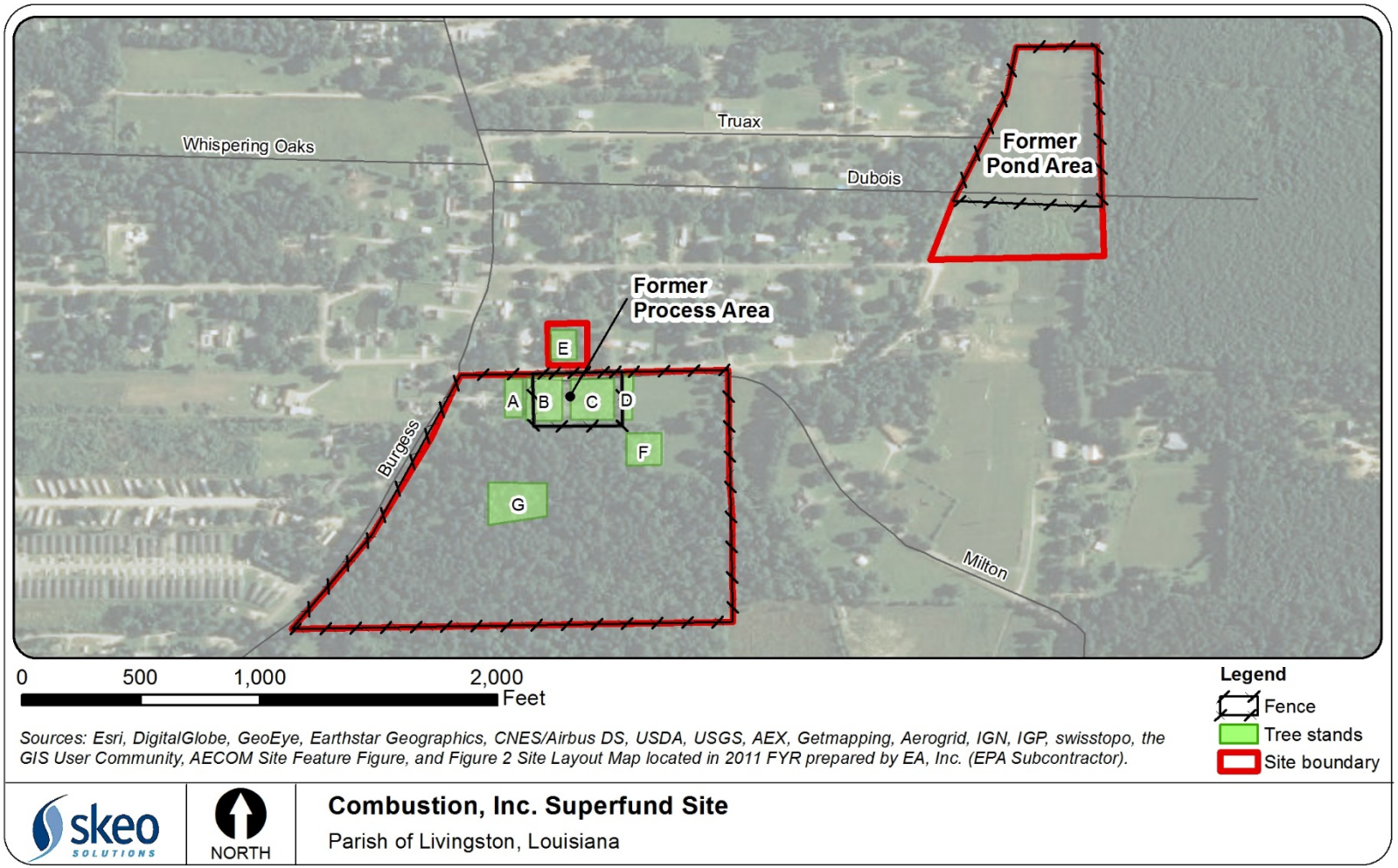
The Site is a former waste oil recycling facility in Livingston Parish, Louisiana. It is about 3 miles northeast of Denham Springs on the periphery of an isolated rural residential area, surrounded by moderately- to heavily-wooded areas (Figure A-1). Access to the Site is via narrow roads, and the Site is not within any city limits. The Site consists of the 2.5-acre former Process Area, where the site operator performed oil reclamation activities, and the 6.5-acre former Pond Area, where the PRP managed and treated waste water through a series of interconnected ponds (Figure A-2). The former Process Area is mostly covered by grass and trees; the only structure on site is a small shed for temporary storage of monitoring well purge water pending analysis. The former Pond Area is more isolated than the former Process Area. A stand of trees and the Drainage Canal separate the Pond Area from the nearest residence. The former Pond Area is located in a high voltage transmission line right-of-way, which is an open grassy field with some shrubs and trees along the fenced perimeter.

Figure A-1: Site Location Map



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

Figure A-2: Site Detail Map



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

Groundwater below the former Process Area consists of upper and lower water-bearing zones. The zones are hydraulically connected and referred to collectively as the shallow groundwater unit. The shallow groundwater is a Class IIB groundwater unit, indicating groundwater is potentially available for drinking water, agriculture or other beneficial use. In the Pond Area, groundwater occurs in two zones designated as Zone 1 (shallow zone) and Zone 2 (deeper zone). A clay layer occurs within Zone 2 at some locations, but is not continuous across the area. Shallow groundwater flows south and discharges to West Colyell Creek, 0.75 mile south-southwest of the former Process Area.

A-2.2 Land and Resource Use

The dwellings near the Site are mostly single-family homes located east, west and north of the former Process Area. South of the former Process Area is a moderate- to heavily-wooded area. Groundwater near the Site is not used for drinking water and nearby residences are on the public water supply. The Site is not within any city limits and the remoteness, poor access and existing residential use of the surrounding area indicate that future land use around the Site will likely be residential. The residential area around the former Process Area is also not supplied with public sewage treatment facilities.

In July 2014, the PRPs submitted a document titled, "*Former Pond Area Request for Partial Delisting*" to LDEQ and EPA. This document was in support of delisting the former Pond Area from the NPL because historical groundwater monitoring of this area demonstrated that constituent concentrations in Zone 1 and Zone 2 groundwater meet LDEQ RECAP health-based cleanup levels. EPA is currently evaluating if the former Pond Area can be deleted from the NPL and no longer require monitoring. The former Pond Area is located in a high voltage transmission line right-of-way; the land to the east and west is wooded. The nearest dwellings are about 300 feet to the southwest. Future land use of the former Pond Area is likely to remain as a utility corridor with restricted access. Use of the former Pond Area for residential purposes is not viable.

A-2.3 History of Contamination

Dubose Oil Company and subsequently Combustion, Inc. operated a used oil reclamation facility from the late 1960s until the early 1980s. Site operations involved oil reclamation and wastewater treatment. Operations consisted of a small processing plant (Process Area), a Pond Area and a connecting pipeline. Oil reclamation activities were performed in the 2.5-acre Process Area, which also contained 16 aboveground storage tanks (ASTs), a smaller tanker-truck, 11 underground storage tanks (USTs), a boiler, boiler shed, pump shed and associated foundations, piping, sumps and containment walls. The 6.5-acre Pond Area contained 14 interconnected ponds (Ponds A through N) with an estimated capacity of 4 million gallons for treating stormwater runoff and excess water from oil reclamation activities. Two ASTs and one UST were also present in the Pond Area. The ponds contained water and sludge; five of the ponds contained a floating oil layer. Site operations resulted in the release of liquid and sludge wastes which contaminated soil and groundwater with volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

A-2.4 Initial Response

The PRPs began to close the facility late in 1980. By May 1982, the site owner had completely shut down operations. Following citizens' complaints, the Water Pollution Control Division under the State of Louisiana Department of Natural Resources, Office of Environmental Affairs, recommended enforcement action at the Site. In October 1983, the LDEQ analyzed wastes from the Site and found they contained polychlorinated biphenyls (PCBs), VOCs and heavy metals. The PRP completed field investigations from December 1988 to April 1989. During the preliminary RI field activities, 35 drums containing wastes were removed for off-site disposal in accordance with a removal action authorized by LDEQ.

Following the preliminary RI, the PRPs entered into an agreement with LDEQ. From July 1992 through 1993, the PRP conducted an Expedited Removal Action (ERA) at the Site. The PRP removal activities included the following:

- Oil was recovered, blended and transported off site for use as an alternative fuel at a Resource Conservation and Recovery Act (RCRA)-permitted facility or disposed of at a Toxic Substance Control Act (TSCA)-permitted facility if the oil contained PCBs.
- Over 11 million gallons of water were treated on site using a sequencing batch biological reactor and/or activated carbon, tested and discharged.
- About thirty-four thousand gallons of water were disposed of offsite by permitted, commercial deep well injection.
- Solids, including sludge, soil, stabilization fly ash, solidified paraffin, concrete and debris, were transported off site and disposed of at permitted landfills. If solids contained PCBs above a regulatory threshold limit of 50 milligrams per kilogram (mg/kg), they were disposed of at a TSCA-permitted facility.
- Aboveground storage tanks and a truck tanker were emptied, cleaned, wipe-tested, demolished and cut up for scrap.
- USTs were uncovered, emptied and removed. Larger USTs were cleaned, wipe-tested and cut up as scrap; smaller USTs were disposed of as hazardous waste.

During the ERA, the PRP collected verification samples to confirm that residential risk-based cleanup values were met at the former Process Area and industrial risk-based cleanup values protective of utility workers were met in the former Pond Area.

A-2.5 Basis for Taking Action

The Site's 1997 baseline human health and ecological risk assessment was performed as part of the Phase II RI. Residential exposure to contaminated surface soil was addressed by the ERA; therefore, the RI evaluated risks to future construction and utility workers exposed to subsurface soil at the former Process Area. The PRPs concluded that cancer risks were below EPA's excess cancer risk management range of 1×10^{-4} to 1×10^{-6} and the noncancer hazard index (HI) was below 1.0. Industrial worker exposure to contaminated soils at the former Pond Area was addressed by the ERA; thus, the PRP did not identify any completed exposure pathways within the fenced area of the former Pond Area. Therefore, no risks were quantified for the former Pond Area as part of the RI. Off-site risks to human and ecological receptors were evaluated and the

PRP determined the risks were within acceptable limits. Although the human and ecological risk assessment did not identify any unacceptable health risks, LDEQ concluded that remedial alternatives should be developed in a Feasibility Study Report for upper water-bearing zone groundwater, due to the presence of site contaminants above drinking water criteria.

A-3.0 Remedial Actions

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

A-3.1 Remedy Selection

Initially, LDEQ and EPA divided the Site into three OUs: the Source Control OU (the Soil OU), a Management of Migration OU (the Groundwater OU) and an Other Off-Site Areas OU (Off-Site OU). The Soil OU was addressed during the ERA. The PRPs demonstrated that the Off-site OU did not pose unacceptable risks. Therefore, LDEQ and EPA selected a remedy in the 2004 ROD that addresses the Site as one OU, the Site-Wide OU. The ROD listed the following remedial action objectives (RAOs):

- Prevent exposure to upper water-bearing zone groundwater impacted by site-related contaminants at concentrations greater than maximum contaminant levels (MCLs). For contaminants with no established MCL, the acceptable concentration is a risk-based concentration or the quantitation limit, whichever is higher.
- Restore groundwater quality to the extent practicable.

The ROD selected phytoremediation and monitored natural attenuation (MNA) to address contaminated groundwater. The selected remedy specified the following components:

- Phytoremediation.
- MNA for groundwater in the upper and lower water-bearing zones near the former Process Area
- Biogeochemical monitoring of natural attenuation of the groundwater contaminants before each FYR, coupled with fate and transport modeling of the 2,4/2,6-toluenediamine (TDA) and 1,2-dichloroethane (EDC) plumes.
- Monitoring of groundwater in Zone 1 and Zone 2 near the former Pond Area for VOCs.
- Long-term care of the remedy.
- Hot-spot treatment as a contingency remedy to provide additional treatment in the more highly-contaminated areas of the groundwater plume, should the selected remedy fail to meet the specified criteria when evaluated during the first FYR.
- Institutional controls in the form of conveyance notices for the former Pond Area soils and the former Pond and Process Area groundwater.

The 2004 ROD established groundwater cleanup goals based on federal MCLs and health-based concentrations (Table A-2) developed under Louisiana's Risk Evaluation Corrective Action Program (RECAP).

Table A-2: Groundwater COC Cleanup Goals

COC[a]	2004 ROD Cleanup Goal (µg/L)[a]	Basis
TDA	10	RECAP GW1
o- and/or p-Toluidine	10	RECAP GW1
1,1,2-Trichloroethane	5	Federal MCL
1,1-Dichloroethane	749	RECAP GW2 *DF2*Modification Factor
1,1-Dichloroethene	6	Federal MCL
EDC	5	Federal MCL
Acetone	564	RECAP GW2 *DF2*Modification Factor
Benzene	5	Federal MCL
Chloroethane	28	RECAP GW2 *DF2*Modification Factor
Cis-DCE	518	RECAP GW2 *DF2*Modification Factor
Methylene chloride	4	Federal MCL
Tetrachloroethene	5	Federal MCL
Toluene	1,000	Federal MCL
Vinyl chloride	2	Federal MCL

Notes:
a. Cleanup goals as defined in the 2004 ROD, Table 11.
RECAP – LDEQ's Risk Evaluation Corrective Action Program
RECAP GW1 – the RECAP standard for groundwater within an aquifer that could potentially supply drinking water to a public water supply.
RECAP GW2 - the RECAP standard for groundwater within an aquifer that currently or could potentially supply drinking water to a domestic water supply.
DF2 - RECAP default dilution factor representative of natural dilution of constituent concentrations from the point of compliance to the point of exposure (nearest downgradient property boundary).
Modification Factor – a factor applied to a RECAP standard to account for additive effects for multiple chemicals.
µg/L – microgram per liter

A-3.2 Remedy Implementation

LDEQ and the PRPs entered into a Cooperative Agreement on March 25, 2005 (LDEQ and Combustion Inc. Participating Parties 2005). The Cooperative Agreement specified the work activities required to design, install, operate and monitor the remedial action. The following documents were prepared in accordance with the Cooperative Agreement:

Remedial Design Work Plan (June 3, 2005, revised August 15, 2005)
Tree Stands F and G Phytoremediation Report (September 13, 2005)
Process Area Field Sampling Plan (December 16, 2005)
Remedial Action Work Plan January 6, 2006).

With LDEQ conditional approval of the RAWP on January 26, 2006, the PRPs initiated the remedial action on February 11, 2006. The conditional approval required an updated operation and maintenance (O&M) schedule that was later finalized. The selected remedy was installed as planned, and no additional areas of contamination were found.

As required by the ROD, two new stands of trees, also referred to as tracts (Tracts F and G), were planted during the winter of 2006. The new tree stands were located to fill in areas to the south (downgradient) of the former Process Area that were not fully covered with existing natural, or self-seeded, trees. Drainage improvements for the new tree stands and extension of the current irrigation system to these stands were designed to provide sufficient water for the newly planted trees to thrive. However, the drainage system was also designed to prevent tree damage from water ponding around the bases of the trees for extended periods of time. A total of 188 and 220 trees were planted in Tracts F and G, respectively. Most of the trees were cottonwoods 0.75-inch to 1.5-inch in diameter.

Based on the first FYR, LDEQ determined that implementation of the hot spot contingency was not warranted. In March and April 2013, the PRP planted additional trees in Tract C, where trees were missing as a result of hurricanes, winter storms or other damage. In addition, the PRP prepared a Class V injection Well Permitting Waiver, which was filed with and approved by the Louisiana Department of Natural Resources in March 2013. The waiver was to allow the in situ application of oxygen release compound (ORC®) in selected borehole planting locations before tree planting; this would allow evaluation of the enhancement of the biodegradation rate.

No additional monitoring wells were needed for implementation of the groundwater MNA remedy. Eight piezometers were installed in May 2005 to monitor the phytoremediation-induced groundwater gradient changes. The PRPs sampled all monitoring wells in April 2006 to serve as the baseline event. In addition, in 2006, the PRPs filed Property Conveyance Notices for registry and recorded them in the Clerk of Court's office for Livingston, Parish, which restrict land use at the former Pond Area and former Process Area to industrial/commercial use (Section 3.3). In July 2006 EPA and LDEQ signed the preliminary closeout report.

A-3.3 Operation and Maintenance (O&M)

The maintenance requirements for phytoremediation were specified in the 2005 Field Sampling Plan (FSP) (URS, 2005). According to this plan, during the first year, which was the 2006

growing season, the arborist would monitor conditions at the Site and work with the site maintenance team to provide care for the trees. The site maintenance program included watering, fertilizing, mowing, mulching/soil amending, pest control and trimming. In 2014, the PRP revised the FSP to implement recommendations from the 2011 FYR, which included reduced monitoring. For example, measuring soil gas, tree health (tree girth), tree leaf transpiration gas, root zone soil, sap flow, tree tissue and running screening models BIOCHLOR and BIOSCREEN are no longer required. Groundwater sampling and water level frequency have been reduced in the former Process Area to once per year through 2015, then to three times per FYR period thereafter. In addition, several wells no longer require monitoring, including PW-13, and background wells BW-3SR and BW-3D. The most significant outcome of the revised FSP was the reduction in groundwater monitoring frequency from a semiannual event to an annual event.

General O&M activities during the past five years included maintaining perimeter fencing and gates, and mowing in the former Process and Pond Areas to comply with local regulations. Major maintenance and repairs are discussed below.

In April 2012, PW-4R was installed to replace PW-04, which had a damaged well screen. In February 2013, trees were planted to expand the phytoremediation footprint and address contaminated groundwater near PW-08. In March and April 2013, the PRP planted trees in Tract C, where trees were missing as a result of hurricanes, winter storms or other damage.

The 2004 ROD estimated that O&M costs would be about $561,000 per year for thirty years. As shown in Table A-3 the O&M costs for all site-related O&M between 2010 and 2014 were lower. Further, there was an O&M cost reduction of about $75,000 in 2014 due to reducing groundwater monitoring from a semiannual event to an annual event.

Table A-3: Annual O&M Costs

Year	Total Cost *(rounded to the nearest $1,000)*
2010	$345,000
2011	$245,000
2012	$354,000
2013	$412,000
2014	$224,000

Appendix B: List of Documents Reviewed

1992 Phase II Removal Action Work Plan. Combustion, Inc. Site. Livingston Parish, Louisiana. Prepared by ERM-Southwest, Inc. November 1992.

1994 Final Expedited Removal Action Report. Combustion, Inc. Livingston Parish, Louisiana. Prepared by Woodward-Clyde. August 1994.

2003 Risk Evaluation/ Corrective Action Program (RECAP). Prepared by LDEQ Corrective Action Group. October 2003.

2004 Record of Decision Summary. Combustion, Inc. Superfund Site, Livingston Parish, Louisiana. Site Number LAD 072606627. AI No. 2941. Prepared by LDEQ. April 2004.

2006 Preliminary Close Out Report, Combustion, Inc. Superfund Site, Livingston Parish, Louisiana. Prpeared by Louisiana Department of Environmental Quality and U.S EPA Region 6 Superfund Division. June 2006.

2010. EPA Site Status Summary for Combustion Inc. Superfund Site, Livingston Parish, Louisiana. September. http://www.epa.gov/region6/6sf/pdffiles/combustion-la.pdf.

2011 Annual Report Year 6 Remedy Implementation. Combustion, Inc. Site, Livingston Parish, Louisiana. AI No. 2941. Prepared for Combustion, Inc. by URS Corporation. March 2012.

2011 First Five-Year Review Report for the Combustion, Inc. Superfund Site, Livingston Parish, Louisiana. Prepared by EPA Region 6. February 2011.

2012 Annual Report Year 7 Remedy Implementation. Combustion, Inc. Site, Livingston Parish, Louisiana. AI No. 2941. Prepared for Combustion, Inc. by URS Corporation. March 2013.

2012 Monitor Well PW-4 Replacement and April Sampling. Combustion, Inc. Superfund Site, Livingston Parish, Louisiana. Prepared by URS Corporation. March 2012.

2013 Annual Report Year 8 Remedy Implementation. Combustion, Inc. Site, Livingston Parish, Louisiana. AI No. 2941. Prepared for Combustion, Inc. by URS Corporation. March 2014.

2013 Final Field Sampling Plan. Combustion, Inc. Site, Livingston Parish, Louisiana. Site Number LAD 072606627. AI No. 2941. Prepared for Combustion, Inc. by URS Corporation. November 2013.

2013 Monitor well PW-8 Phytoremediation Expansion. Combustion, Inc. Superfund Site, Livingston Parish, Louisiana. Prepared by URS Corporation. February 2013.

2014 Annual Report Year 9 Remedy Implementation. Combustion, Inc. Site, Livingston Parish, Louisiana. AI No. 2941. Prepared for Combustion, Inc. by URS Corporation. March 2015.

2015 Annual Report Year 10 Remedy Implementation. Combustion, Inc. Site, Livingston Parish, Louisiana. AI No. 2941. Prepared for Combustion, Inc. by URS Corporation. August 2015.

2014 Final Former Pond Area Request for Partial Delisting. Combustion, Inc. Site. Livingston Parish, Louisiana. Prepared by URS Corporation. July 2014.

2013 Stand C Phytoremediation Treewell Planting After Action Report. Combustion, Inc. Superfund Site, Livingston Parish, Louisiana. Prepared by URS Corporation. May 2013.

Appendix C: Press Notice

STATE OF LOUISIANA PARISH OF LIVINGSTON

Before me, the undersigned authority, personally came and appeared Ashleigh David

who, being duly sworn, deposes and says: That she is an agent of the Livingston Parish News, a newspaper published Sunday and Thursday in Denham Springs, Louisiana.

That the hereto attached advertisement for Combustion Inc. Superfund Site

was published in said newspaper in it's issues dated: 11/8/15

Sworn and subscribed before me in Denham Springs, Louisiana, on this 9 day of November A.D. 2015

Witness)

Jamie E. Webb (Witness)

J. McHugh David Jr, Notary Public
Notary ID No. 139643

The Livingston Parish News

MIKE DOWTY | THE NEWS

l as he helped lead the Eagles

graphs, team pictures, records and scores, and a. Scrapbook and year- elcome. Contact Smart at ringsfootball.com or (225)

ball history

ool football program is notos, records or other ut the history of football rmation or leads are wel- ames Roberts at 225-975- berts@lpsb.org.

lable

ange has a grass T-box lo- baseball stadium that is :30 p.m. Tuesday through 8:30 p.m. on weekends. londay. Bag prices are small. For more infor-

ublishes items of interest to the unity concerning programs and youts, benefits and other activi- ts Shorts, call 665-5176, fax to livingstonparishnews.com.

BLIC ICES

Public Meeting

Thursday, December 10, 2015, at 7:00 PM at the School Board gston, Louisiana, the Parish School Board of the Parish of ing a resolution ordering and calling an election to be held in te of Louisiana, to authorize the issuance of general obligation

Thursday – October 29, 2015
Sunday – November 08, 2015

PUBLIC NOTICE

ADJUDICATED PROPERTY SALE

Assessment Number: 168765, Ward 5
Physical Address: 13410 Boat Landing Rd, Maurepas, LA
Legal Description: Lot 14 Square E of James Campsites Sec 16-T9S-R5E
GPS Coordinates: 30° 15' 44.05" N 90° 42' 35.58" W

As authorized by Parish Ordinance, the sale of the above property will commence on 11/16/2015 at 9:00 am at the Livingston Parish Health unit located at 29261 South Frost Road, Livingston, LA 70754, in the 1st floor conference room. Any person with questions can call 225-686-3030 Ext 4602.

Only those parties who have advanced the costs of $375.00 originally, or who have made a subsequent offer and deposit of $375.00, will be allowed to submit higher bids to the Parish at that time. The cut-off date to have these deposits is 11/12/15 by 2:00 pm.

PLEASE PUBLISH:

Thursday - October 15, 2015
Sunday - November 8, 2015

PUBLIC NOTICE

ADJUDICATED PROPERTY SALE

Assessment Number: 150458, Ward 5
Physical Address: 22427 Snipe Street, Maurepas, LA
Legal Description: Lots 13 & 14 Block E of Hoover & Berthelot Campsites Sec 16-9-5 Book 600 Page 351
GPS Coordinates: 30° 15' 27.27" N 90° 42' 37.07" W

As authorized by Parish Ordinance, the sale of the above property will commence on 11/16/2015 at 9:00 am at the Livingston Parish Health unit located at 29261 South Frost Road, Livingston, LA 70754, in the 1st floor conference room. Any person with questions can call 225-686-3030 Ext 4602.

Only those parties who have advanced the costs of $375.00 originally, or who have made a subsequent offer and deposit of $375.00, will be allowed to submit higher bids to the Parish at that time. The cut-off date to have these deposits is 11/12/15 by 2:00 pm.

PLEASE PUBLISH:

Thursday - October 15, 2015
Sunday - November 8, 2015

Combustion Inc. Superfund Site
Public Notice
U. S. Environmental Protection Agency, Region 6

October 2015

The U.S. Environmental Protection Agency Region 6 (EPA) will be conducting the second five-year review of remedy implementation and performance at the Combustion Inc. Superfund site (Site) in Livingston Parish, Louisiana. From the late 1960s to the early 1980s, the site owner operated a waste oil recycling facility. The Site includes fenced, forested and open space areas. Nearby land uses include homes surrounded by wooded areas. The site-wide remedy includes phytoremediation with monitored natural attenuation, institutional controls, and long-term maintenance and monitoring. The five-year review will determine if the remedies are still protective of human health and the environment. The five-year review is scheduled for completion in February 2016.

The report will be made available to the public at the following local information repository:

Denham Springs-Walker Branch Library
8101 Highway 190
Denham Springs, Louisiana, 70726
(225) 665-8118

Site status updates are available on the Internet at http://www.epa.gov/superfund/combustion

All media inquiries should be directed to the EPA Press Office at (214) 665-2200

For more information about the Site, contact:

Brian Mueller/Remedial Project Manager
(214) 665-7167
or 1-800-533-3508 (toll-free)
or by email at mueller.brian@epa.gov

Mike McCorkhill/Community Involvement Coordinator
(214) 665-8553
or 1-800-533-3508 (toll-free)
or by email at mccorkhill.michael@epa.gov

Livingston Parish Gravity Drainage District No. 5/Special Taxing District No. 5
32030 Avants Road
Walker, LA 70785

AGENDA

NOVEMBER 9, 2015 7:00 pm

1. MINUTES OF 10/26/15 MEETING ..... MILLER
2. AUTUMN RUN SERVITUDE ..... RONNIE JONES
3. FOREMAN'S REPORT ..... HOPKINS
4. ATTORNEY'S REPORT ..... FORE
5. ENGINEER'S REPORT ..... AYDELL
6. CHAIRMAN'S REPORT ..... KILLCREASE
7. APPROVAL OF BILLS ..... KILLCREASE
8. ADJOURN ..... KILLCREASE

Appendix D: Interview Forms

Combustion, Inc. Superfund Site		**Five-Year Review Interview Form**	
Site Name:	**Combustion, Inc.**	**EPA ID No.:**	**LAD072606627**
Interviewer Name:	**N/A**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Todd Thibodeaux**	**Affiliation:**	**LDEQ**
Subject Contact Information:	**thibodeaux@la.gov**		
Time:	**N/A**	**Date:**	**8/12/2015**
Interview Location:	**N/A**		

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   My overall impression of the project so far is successful.

2. What is your assessment of the current performance of the remedy in place at the Site?
   The performance of the remedy by far exceeded my expectations

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?
   None that I can remember in the last five years

4. Has your office conducted any site-related activities or communications in the past five years apart from standard communications? If so, please describe the purpose and results of these activities.
   No

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?
   None that I'm aware of

6. Do you feel that the recommendations from the 2011 FYR have been sufficiently addressed?
   Yes

7. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   Yes

8. Are you aware of any changes in projected land use(s) at the Site?
   None that I'm aware of

9. Do you have any additional comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   Not at this point, everything seems to be going as scheduled

Combustion, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: **Combustion, Inc.** **EPA ID No.:** **LAD072606627**
Interviewer Name: **NA** **Affiliation:** **Skeo Solutions**
Subject Name: **Michael Pisani** **Affiliation:** **Michael Pisani & Associates, Inc.**
Subject Contact Information: **mpisani@mpisani.com or (504) 582-2468**
Time: **N/A** **Date:** **7/29/2015**
Interview Location: **N/A**

Interview Format (circle one): **In Person** **Phone** **Mail** **Other: Email**

Interview Category: **Potentially Responsible Party**

1. What is your overall impression of the remedial activities at the Site?
   The work conducted was in conformance with the ROD and EPA/LDEQ approved plans. The site is well maintained. The groundwater sample results demonstrate declining concentrations, contaminant mass and plume size. The results demonstrate the remedy is working. Groundwater results for the former Pond Area indicate it can be delisted. Further optimization of monitoring and site maintenance to reduce costs.

2. What have been the effects of this Site on the surrounding community, if any?
   Extremely positive; the tree planting and maintenance of site grounds are appreciated by the community.

3. What is your assessment of the current performance of the remedy in place at the Site?
   The groundwater results demonstrate the remedy (combination of phytoremediation and monitored natural attenuation) is working.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents in the past five years?
   None

5. Do you feel that the recommendations from the 2011 FYR have been sufficiently addressed?
   Yes. However, EPA/LDEQ approved Field Sampling Plan 2014 removed some monitoring tasks that were discussed in the 2011 FYR recommendations. Consistent with the revised Field Sampling Plan 2014, these activities are modified to reflect appropriate monitoring of the current impacts to the site groundwater.

6. Are you aware of any changes in projected land use(s) at the Site?
   None

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.
   Groundwater sampling was reduced from semiannual to annual. This resulted in a significant cost savings for the PRP group.

8. Do you have any additional comments, suggestions or recommendations regarding O&M activities and schedules at the Site?
   None

Combustion, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: **Combustion, Inc.** **EPA ID No.:** **LAD072606627**
Interviewer Name: **N/A** **Affiliation:** **Skeo Solutions**
Subject Name: **William Hurdle** **Affiliation:** **AECOM**
Subject Contact: **william.hurdle@aecom.com**
Information:
Time: **N/A** **Date:** **8/18/2015**
Interview Location: **N/A**

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: O&M Contractor

1. What is your overall impression of the remedial activities at the Site?
   The project is proceeding well. The contaminant concentrations in the groundwater are decreasing. The phytoremediation tree stands are thriving. There is good communication between the regulatory agencies and the PRP group and their contractors Overall the Combustion, Inc. Superfund Site project is a success.

2. What is your assessment of the current performance of the remedy in place at the Site?
   The remedy, monitored natural attenuation enhanced with phytoremediation is functioning as expected. The remedy is performing very well as evidenced by the decreasing groundwater concentrations.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?
   The remedy continues to meet or exceed expectations. Constituent concentrations continue to decline on average in the monitoring wells. Plume areas continue to shrink.

   Former Process Area Upper Water-Bearing Zone (UWBZ): The UWBZ groundwater was sampled semiannually in 2011, 2012 and 2013 based on the December 2005 Field Sampling Plan and then annually in 2014 and 2015, based on the October 2014 revised Field Sampling Plan. Site-specific contaminants include chlorinated volatiles, aromatic amines, and gasoline components (such as benzene and toluene). ROD-required calculations of geometric mean concentrations of 1,2-dichloroethane (EDC) and 2,4 and/or 2,6-toluenediamine (TDA) exhibit significant decreases (further discussion provided in Item 7.a. below). Breakdown daughter product concentrations are also observed within the EDC and TDA plumes.

   Former Process Area Lower Water-Bearing Zone (LWBZ): The LWBZ groundwater was sampled in 2015. There were relatively few reported constituents in the groundwater. The reported constituent concentrations for ROD-listed constituents were below the respective cleanup level and for non-ROD-listed constituents the concentrations were below the respective Louisiana Risk Evaluation/Correct Action Program (RECAP) Screening Option standard.

   Former Pond Area: The Pond Area Zone 1 groundwater was sampled in 2015. The reported constituent concentrations were below the respective Louisiana RECAP

Screening Option standards and comparatively for ROD-listed constituents, the reported concentrations were also below the ROD clean-up levels for the Process Area UWBZ.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.
   O&M is periodic not continuous.

   The contractor site arborist conducts periodic inspections during the growing season (March to October) to monitor the phytoremediation tree stands. The tree maintenance activities are dictated by seasonal weather patterns (excessive dry periods, tropical storms or hurricanes, etc.) and infestations of pests, if any.

   The contractor site waste coordinator is on site weekly as needed per RCRA requirements during the maximum 180-day temporary storage period for a small quantity generator when purge water generated during sampling of the monitor wells characterized as hazardous waste is awaiting transportation and disposal.

   During the mowing season (April through October), the contractor site manager conducts twice-monthly inspections of the site properties in addition to providing oversight for the grass cutting crew and confirming completeness of the respective grass cutting event. Inspections are also conducted twice a month during the period of November through March solely to evaluate conditions at the site. While at the site, the contractor site manager inspects both the former Process Area and former Pond Area and adjacent Combustion Group-owned properties. Action items are noted and communicated to the project management team. The contractor site manager then leads the effort to address the action item.

   The contractor field sampling team performs the groundwater monitoring sampling events during the spring (April) and fall (October) for the semiannual events in 2011, 2012 and 2013 and during the spring (April) for the annual event in 2014 and 2015. The contractor field sampling team is also on site during other periods to support ROD-required sampling and monitoring activities, particularly with regard to the phytoremediation tree stands.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines in the last five years (please provide general summary of costs in table below)? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.
   No significant changes. Following Hurricane Isaac in 2012 and a severe thunderstorm in April 2015, there were immediate needs to remove fallen trees and upright and stake semi-fallen trees. However, once this manpower intensive operation was complete, the contractor site arborist returned to providing care for the tree stands and the contractor site manager also resumed his duties. The sampling routines (other than reduction in frequency from semiannual to annual) and maintenance schedule (such as grass cutting) has remained relative constant throughout this five-year period and has had no

effect on the protectiveness or effectiveness of the remedy.

Annual O&M Costs

Date Range	Total Cost *(rounded to the nearest $1,000)*
2010	$345,000
2011	$245,000
2012	$354,000
2013	$412,000
2014	$224,000

6. Have there been unexpected O&M difficulties or costs at the Site in the last five years? If so, please provide details.
   With the exception of Hurricane Isaac in 2012 and a severe thunderstorm in 2015, there have been no O&M problems or difficulties. The effect of these storms appears to have been overcome for the most part. The tree stands are thriving, and the groundwater concentrations are decreasing.

7. Do you feel that the recommendations from the 2011 Five Year Review have been sufficiently addressed?
   The following recommendations and follow-up actions were listed in Table 5 of the First Five-Year Review Report for the Combustion Site, February 2011. These items are provided below and are followed with a response.

   a. Groundwater concentrations for the two tracking constituents, EDC and TDA, met the 10 percent reduction in geometric mean concentration criteria specified in the ROD for the first FYR period: *The respective geomean concentrations for EDC and TDA continue to decline. The geomean concentration for EDC has reduced approximately 90 percent from the spring 2006 baseline event. Similarly, the geomean concentration for TDA has reduced approximately 85 percent also from the spring 2006 baseline event.*

   b. No vertical migration of COCs into the lower water-bearing zone (LWBZ) has been demonstrated for the site: *The former Process Area LWBZ wells were sampled in 2015 prior to the FYR. Results are discussed in the response in Question 3 above.*

   c. The trends for the tracking constituents, TDA and EDC are not similar for all COCs and daughter compounds, such as toluene, are increasing above the cleanup levels due to degradation: *Annual reports include trend graphs and plume delineation figures for all parent and daughter compounds in addition to EDC and TDA.*

   d. Detection limits for some compounds are at or above the cleanup levels: *Detection limits exceed cleanup levels only in wells where target compounds require dilution. Multiple dilutions are run in an attempt to alleviate this circumstance. As target compounds eventually decrease, the detection limits will do likewise due to decreasing dilution factors employed to report the concentration of a target*

compound.

e. Establishment of a phytoremediation-induced gradient was inconclusive: *Although no significant change in the groundwater gradient has been demonstrated, the lack of plume migration and, in fact, over the last five years, the evidence of plume reduction, either downgradient or vertically, support the intended purpose of the phytoremediation stands as described in the ROD. Water level monitoring is continued but sap flow measurements and tree core sampling have been discontinued in accordance with the October 2014 revised Field Sampling Plan (FSP).*

f. Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy: *The former Process Area UWBZ wells and the LWBZ wells were sampled in 2015 prior to the Five-Year Review for MNA parameters. No substantial change was noted in the subsurface environment when compared to the first five-year review and thus no decline in the influence of the continued effectiveness of the MNA component of the remedy.*

g. Several parameters measured in support of phytoremediation provided useful information to demonstrate contaminant biodegradation: *Visual inspection of individual tree health is conducted and reported annually. Rhizosphere sampling and transpiration gas sampling have been discontinued in accordance with the revised October 2014 FSP.*

h. The number of data points used to verify BIOCHLOR and BIOSCREEN modeling is limited: *BIOCHLOR and BIOSCREEN modeling are no longer useful at the Site and have been discontinued in accordance with the October 2014 revised FSP.*

i. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable: *The Buscheck and Alcantar rate constant methodology are no longer applicable at the site and have been discontinued in accordance with the October 2014 revised FSP.*

j. The cleanup level for *cis* 1,2-dichlororethene is set at 0.518 mg/l, which is significantly higher than the MCL of 0.07 mg/l: *The concentrations of cis-1,2-dichloroethene have been monitored in the wells at the site and reported in the annual reports and the concentrations remain at levels lower than the ROD cleanup level and the MCL.*

k. The human health risk assessment did not evaluate volatilization from ground water to indoor air for the Process Area: *The pathway for volatilization of groundwater to indoor air continues to be incomplete. Institutional controls have been put in place by the PRP Group to prohibit construction that could create an enclosed structure that could present a complete exposure pathway. Concentrations of constituents for the 2015 groundwater monitoring event meet the Louisiana RECAP standard for an*

enclosed structure in an industrial setting and a non-industrial setting.

l. Human health risk assessment methodologies for dermal and inhalation toxicity have changed since the assessment was performed at the site: *The exposure pathway to groundwater continues to be incomplete. The contribution of the dermal and inhalation pathways to the respective groundwater standards were determined to be insignificant. The ROD cleanup levels for groundwater will be reviewed for appropriateness and an evaluation will be provided in the 2015 annual report.*

8. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.
The monitoring and sampling efforts for the first five-year review period were very extensive and expensive for the PRP Group to implement. These efforts also did not consistently produce useful data for evaluating the remedy. ThePRP Group submitted a revised FSP in November 2013 for review by the EPA and LDEQ to address the sampling program for Remedy Years 9 and 10. The revised FSP was reviewed and further revised and then issued final in October 2014. The revised FSP includes all specific tasks required by the ROD (no ROD amendment required) but incorporates more cost effective, yet suitable methods for accomplishing these ROD-required tasks, where appropriate. The most significant outcome as a result of the revised FSP was the reduction in groundwater monitoring frequency from a semiannual event to an annual event. This reduction realized a cost savings of approximately $75,000 in 2014 and a similar cost savings in 2015 is expected.

9. Do you have any additional comments, suggestions or recommendations regarding O&M activities and schedules at the Site?
Going forward the emphasis should continue to be the evaluation of concentrations of site-related COCs in the groundwater. The tree stands are well established, and the groundwater concentrations are decreasing; thus extensive monitoring of the trees beyond maintaining general plant health care is less important during the next five-year period as evidenced by the reduction of tasks for the monitoring of the trees in accordance with the revised FSP.

Combustion, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name:	**Combustion, Inc.**	**EPA ID No.:**	**LAD072606627**
Interviewer Name:	**N/A**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Brian Mueller**	**Affiliation:**	**EPA Region 6 – Site RPM**
Subject Contact Information:	**mueller.brian@epa.gov**		
Time:	**N/A**	**Date:**	**07/31/2015**
Interview Location:	**N/A**		

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: EPA Remedial Project Manager

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   I am very impressed by the project. The site is well maintained, the cleanup is/was going on with no major issues and has proven to be very effective.

2. What is your assessment of the current performance of the remedy in place at the Site?
   The remedy is performing as expected.

3. What have been the effects of the Site on the surrounding community, if any?
   I am not aware of any impacts on the surrounding community from the cleanup.

4. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities in the past five years?
   No

5. Do you feel that the recommendations from the 2011 Five Year Review have been sufficiently addressed?
   Yes

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   Yes

7. Do you have any additional comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   If the recent groundwater data supports it, I would recommend deleting the pond area from the NPL.

Combustion, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: **Combustion, Inc.** **EPA ID No.:** **LAD072606627**
Interviewer Name: **Eric Marsh** **Affiliation:** **Skeo Solutions**
Subject Name: **Resident 1** **Affiliation:**
Subject Contact Information:
Time: **11:30AM** **Date:** **07/23/2015**
Interview Location:

Interview Format (circle one): **In Person X** **Phone** **Mail** **Other:**

Interview Category: **Residents**

1. Are you aware of the environmental issues at the Site and what cleanup activities have occurred?
   Yes.

2. What is your general impression of the work conducted at the Site during the past five years?
   The Site appears to be taken care of.

3. What effect has this site had on the surrounding community, if any?
   No observed effects.

4. Are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details
   Resident was concerned about the possibility of the Site affecting her tap water.

5. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   No.

6. Do you feel well informed about the site's activities and progress?
   Yes except it was not clear that the groundwater contamination has remained onsite.

7. Do you own a private well in addition to accessing municipal water supplies? If so, for what purpose(s) is your private well used?
   No.

8. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   No.

Combustion, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: **Combustion, Inc.** **EPA ID No.:** **LAD072606627**
Interviewer Name: **Eric Marsh** **Affiliation:** **Skeo Solutions**
Subject Name: **Resident 2** **Affiliation:**
Subject Contact Information:
Time: **11:45 AM** **Date:** **07/23/2015**
Interview Location:

Interview Format (circle one): **In Person X** **Phone** **Mail** **Other:**

Interview Category: **Residents**

1. Are you aware of the environmental issues at the Site and what cleanup activities have occurred?
   Yes.

2. What is your general impression of the work conducted at the Site during the past five years?
   The Site looks cleaned up.

3. What effect has this site had on the surrounding community, if any?
   No observed effects.

4. Are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details
   No.

5. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   No.

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

7. Do you own a private well in addition to accessing municipal water supplies? If so, for what purpose(s) is your private well used?
   No.

8. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   No.

Appendix E: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Combustion, Inc.	**Date of Inspection: 7/23/2015**
Location and Region: Denham Springs, Livingston Parish, Louisiana – EPA Region 6	**EPA ID: LAD072606627**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature: 98 degrees and sunny**

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☒ Monitored natural attenuation
- ☐ Ground water containment
- ☐ Vertical barrier walls
- ☒ Other: Phytoremediation in the former Process Area and east and south of the former Process Area.

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** William Hurdle (Name) | Project Manager (Title) | mm/dd/yyyy (Date)

Interviewed ☐ at site ☐ at office ☒ by email Phone: _____

Problems, suggestions ☐ Report attached: Interview question responses are summarized in Section 3.6.

2. **O&M Staff** _____ (Name) | _____ (Title) | mm/dd/yyyy (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____

Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

Agency LDEQ
Contact Todd Thibodeaux (Name) | LDEQ Site Manager (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached: Interview question responses are summarized in Section 6.6.

Agency EPA
Contact Brian Mueller (Name) | Remedial Project Manager (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached: Interview question responses are summarized in Section 6.6.

Agency : Livingston Parish Office of Homeland Security and Emergency Preparedness
Contact Tim Kuylen (Name) | Deputy (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached: Interview question responses are summarized in Section 6.6.

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☒ Report attached: Interview question responses are summarized in Section 6.6.

PRP representative

Two residents

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

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

Remarks: Located at URS office

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

Remarks: Located at URS office

3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A
Remarks: not verified			
4. **Permits and Service Agreements**			
☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A
Remarks: _____			
5. **Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
Remarks: _____			
6. **Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
Remarks: _____			
7. **Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A
Remarks: URS submits reports annually			
8. **Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
Remarks: _____			
9. **Discharge Compliance Records**			
☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
Remarks: _____			
10. **Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A
Remarks: No logs for site entry are maintained.			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house	☐ Contractor for state
☐ PRP in-house	☒ Contractor for PRP
☐ Federal facility in-house	☐ Contractor for Federal facility
☐ Other	

2. **O&M Cost Records**

☒ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: 2010	To: 2010	$345,000	☐ Breakdown attached
Date	Date	Total cost	
From: 2011	To: 2011	$245,000	☐ Breakdown attached
Date	Date	Total cost	
From: 2012	To: 2012	$354,000	☐ Breakdown attached
Date	Date	Total cost	
From: 2013	To: 2013	$412,000	☐ Breakdown attached
Date	Date	Total cost	
From: 2014	To: 2014	$224,000	☐ Breakdown attached
Date	Date	Total cost	

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

Describe costs and reasons:

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

A. Fencing

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

Remarks: Fencing in good condition and gates secured and locked.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Signs every few hundred feet, clearly marked with emergency contact phone numbers.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

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

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

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

Frequency: When performing Site O&M and monitoring

Responsible party/agency: PRP Contractor

Contact	William Hurdle	Project Manager	08/18/2015	_____
	Name	Title	Date	Phone no.

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

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

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

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

Other problems or suggestions: ☐ Report attached

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

Remarks: ICs restrict land use to industrial but do not restrict disturbing the soil remedy at the former Process Area; this FYR found the ERA cleanup goals not protective for several COCs.

D. General

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

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks:

3. **Land Use Changes Off Site** ☒ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots)	☐ Location shown on site map	☐ Settlement not evident
Arial extent: _____		Depth: _____
Remarks: _____		
2. **Cracks**	☐ Location shown on site map	☐ Cracking not evident
Lengths: _____	Widths: _____	Depths: _____
Remarks: _____		
3. **Erosion**	☐ Location shown on site map	☐ Erosion not evident
Arial extent: _____		Depth: _____
Remarks: _____		
4. **Holes**	☐ Location shown on site map	☐ Holes not evident
Arial extent: _____		Depth: _____
Remarks: _____		
5. **Vegetative Cover**	☐ Grass	☐ Cover properly established
☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
Remarks: _____		
6. **Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
Remarks: _____		
7. **Bulges**	☐ Location shown on site map	☐ Bulges not evident
Arial extent: _____		Height: _____
Remarks: _____		
8. **Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
☐ Wet areas	☐ Location shown on site map	Arial extent: _____
☐ Ponding	☐ Location shown on site map	Arial extent: _____
☐ Seeps	☐ Location shown on site map	Arial extent: _____
☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
Remarks: _____		
9. **Slope Instability**	☐ Slides	☐ Location shown on site map
☐ No evidence of slope instability		
Arial extent: _____		
Remarks: _____		
B. Benches	☐ Applicable ☒ N/A	
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		

1. **Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
Remarks: _____		
2. **Bench Breached**	☐ Location shown on site map	☐ N/A or okay
Remarks: _____		
3. **Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
Remarks: _____		
C. Letdown Channels	☐ Applicable	☒ N/A
1. **Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
Arial extent: _____		Depth: _____
Remarks: _____		
2. **Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
Material type:_____		Arial extent: _____
Remarks: _____		
3. **Erosion**	☐ Location shown on site map	☐ No evidence of erosion
Arial extent: _____		Depth: _____
Remarks: _____		
4. **Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
Arial extent: _____		Depth: _____
Remarks: _____		
5. **Obstructions**	Type: _____	☐ No obstructions
☐ Location shown on site map	Arial extent: _____	
Size: _____		
Remarks: _____		
6. **Excessive Vegetative Growth**	Type: _____	
☐ No evidence of excessive growth		
☐ Vegetation in channels does not obstruct flow		
☐ Location shown on site map	Arial extent: _____	
Remarks: _____		
D. Cover Penetrations	☐ Applicable	☒ N/A
1. **Gas Vents**	☐ Active	☐ Passive
☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration		☐ Needs maintenance ☐ N/A
Remarks: _____		

2. **Gas Monitoring Probes**

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

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

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

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

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

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

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

Remarks: _____

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

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks:

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

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

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

☐ Siltation not evident

Remarks: _____

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

☐ Erosion not evident

Remarks: _____

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

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

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

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

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

Remarks: _____

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

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

Area extent: _____ Depth: _____

Remarks: _____

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

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

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

Area extent: _____ Depth: _____

Remarks: _____

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

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

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

Area extent: _____ Depth: _____

Remarks: _____

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

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

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

A. Ground Water Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

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

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

Remarks: _____

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

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

Remarks: _____

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

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

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

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

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

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

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

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

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

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

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

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

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

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

☐ Chemicals and equipment properly stored

Remarks: _____

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

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

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

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

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

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

☒ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: PW-04 well screen was damaged and the well replaced in April 2012 by PW-04R.

X. OTHER REMEDIES

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

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The remedy is designed to contain the prevent exposure to groundwater and soil by the implementation of institutional and engineering contols, remediating groundwater using phytoremediation and MNA. The remedy is functioning as designed as instutional and engineering controls are in place on impacted parcels and the plumes are shrinking and remain on site.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M activities appear to be sufficient – tree stands are healthy, fencing secure, fields are kept mowed and in good condition. Purged monitoring well water is properly disposed of.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None observed during the site inspection.

D. Opportunities for Optimization

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

None observed during the site inspection.

Appendix F: Removal Action and Site Inspection Photos

Photos Prior to the Expedited Remedial Action (1992-1993)

Process Area

Pond Area

Survey of excavated pond bottom to support excavation volume calculation

Pond bottom receiving first layer of backfill

Site Inspection Photos: February 10, 2015

Phytoremediation Stand (Stand) E Located North of the former Process Area

Milton Road Site Entrance

View north of Stand A along Milton Road.

Stand B located within the former Process Area

Weather station located at the southern boundary of Stand B

Monitoring well PW-04R that replaced PW-04 in April 2012

Example of a tree well in Stand C

Example of hurricane damaged trees recovering in Stand D

View of Stand F

Stormwater surface impoundment located east of Stand G

View of Stand G

Monitoring well PW-08 located north of Stand G

Burgess Road site entrance.

Gated entrance into buffer area prior to entrance into the former Pond Area

Former Pond Area looking north

Monitoring well MW-04 located in the southwest corner of the former Pond Area

View of former Pond Area looking east

Appendix G: Data Review Figures

Figure G-1: Monitoring Well Network for the Combustion, Inc. Superfund Site

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

Figure G-2: Total Aromatic Amines and Hydrocarbons Monitored in PW-01

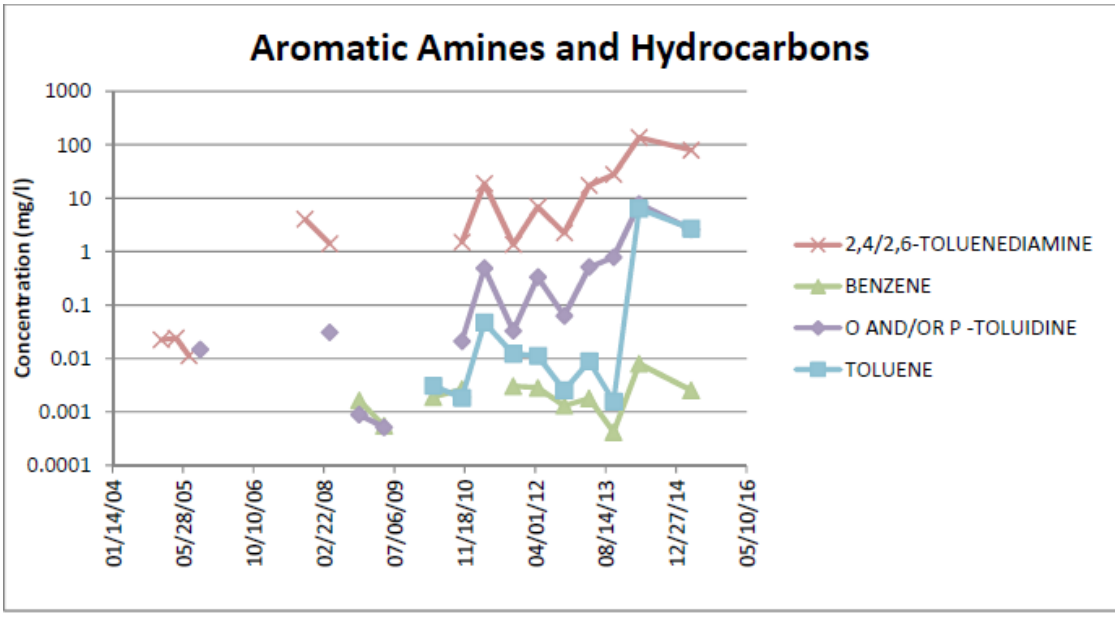


Figure G-3: Total Aromatic Amines and Hydrocarbons Monitored in PW-01S

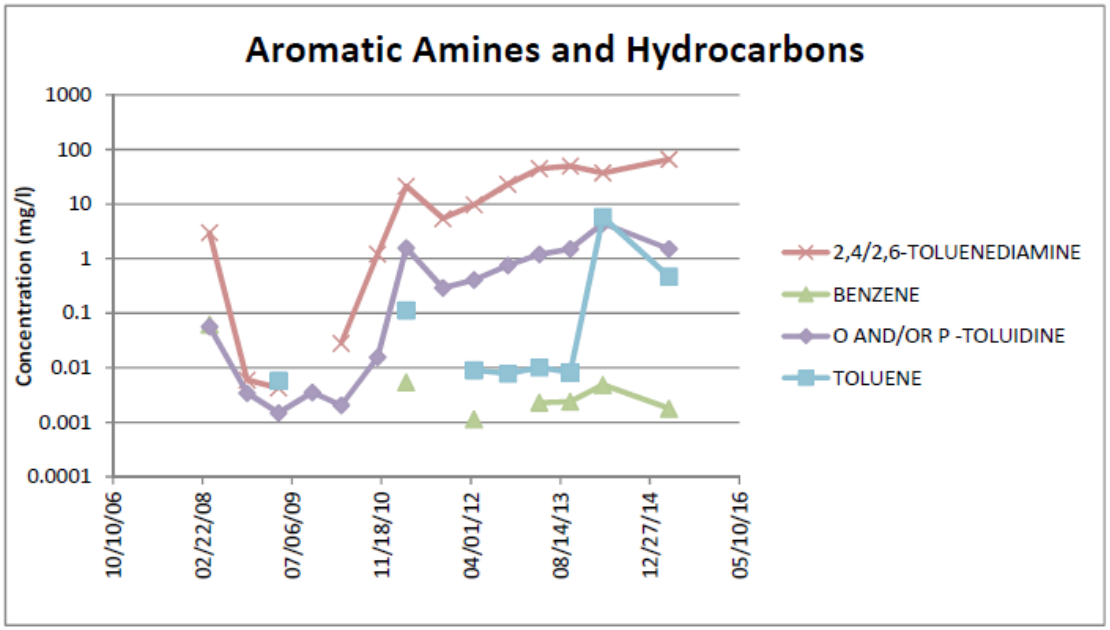


Figure G-4: TDA Plume Shrinkage from 1999 and 2015

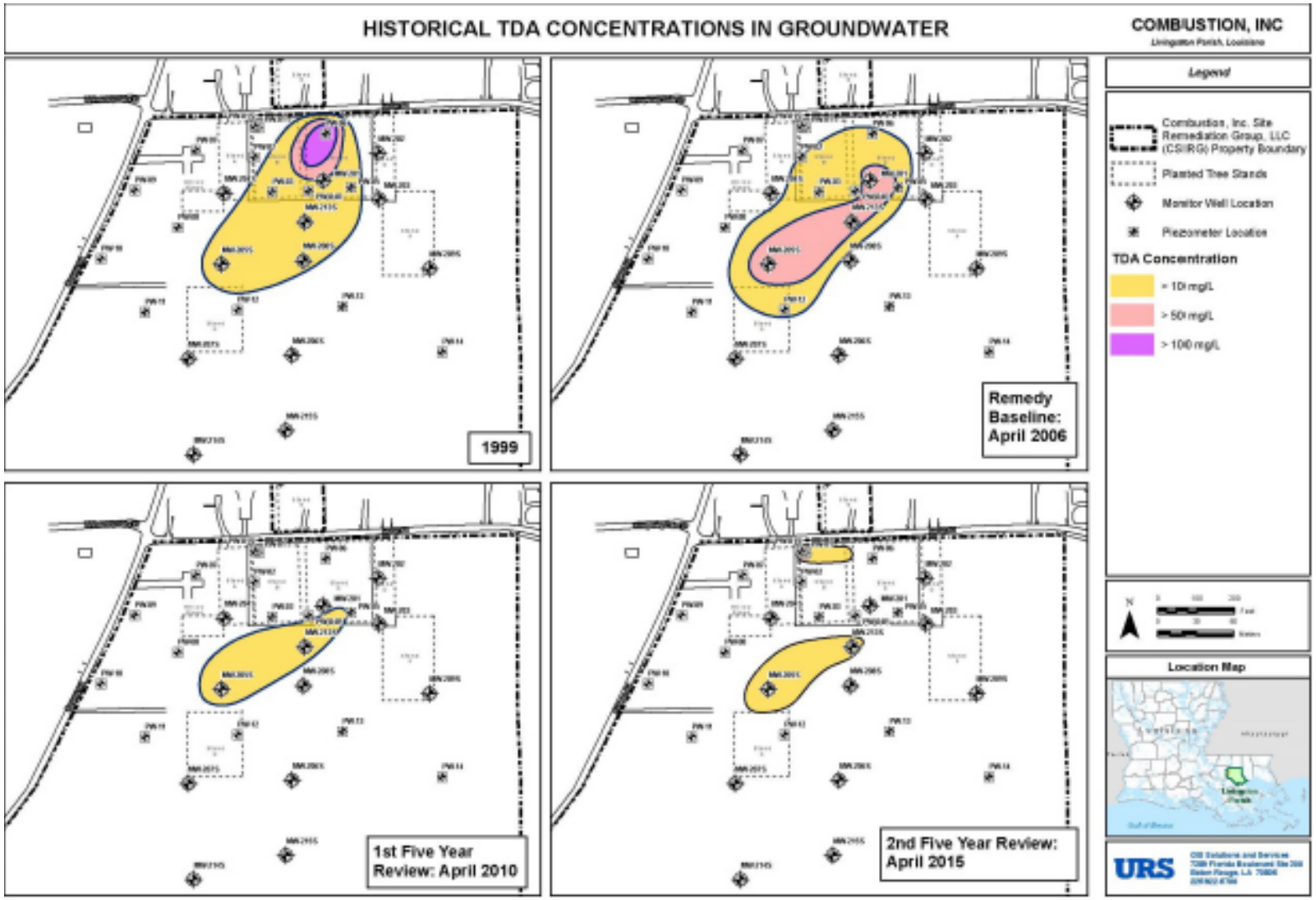
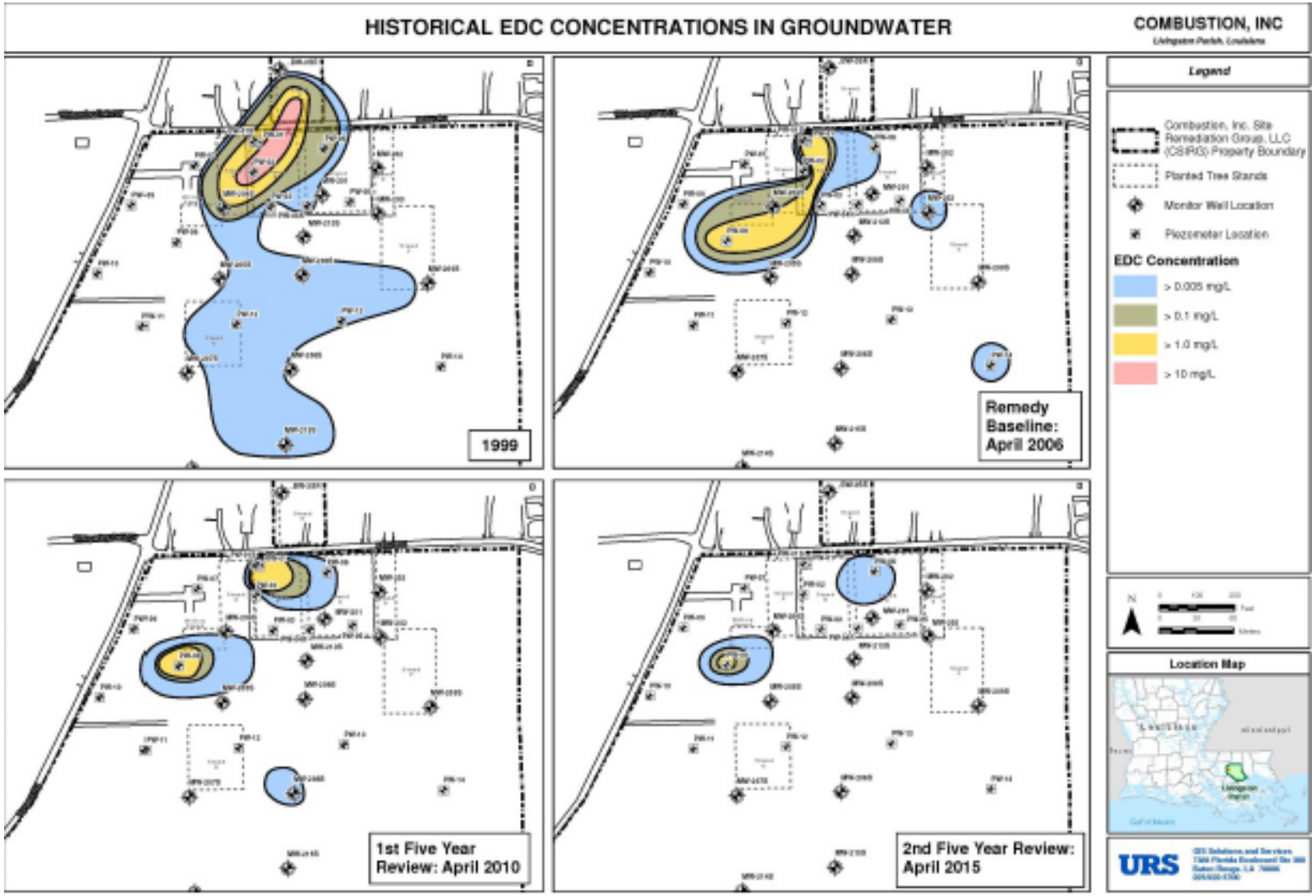
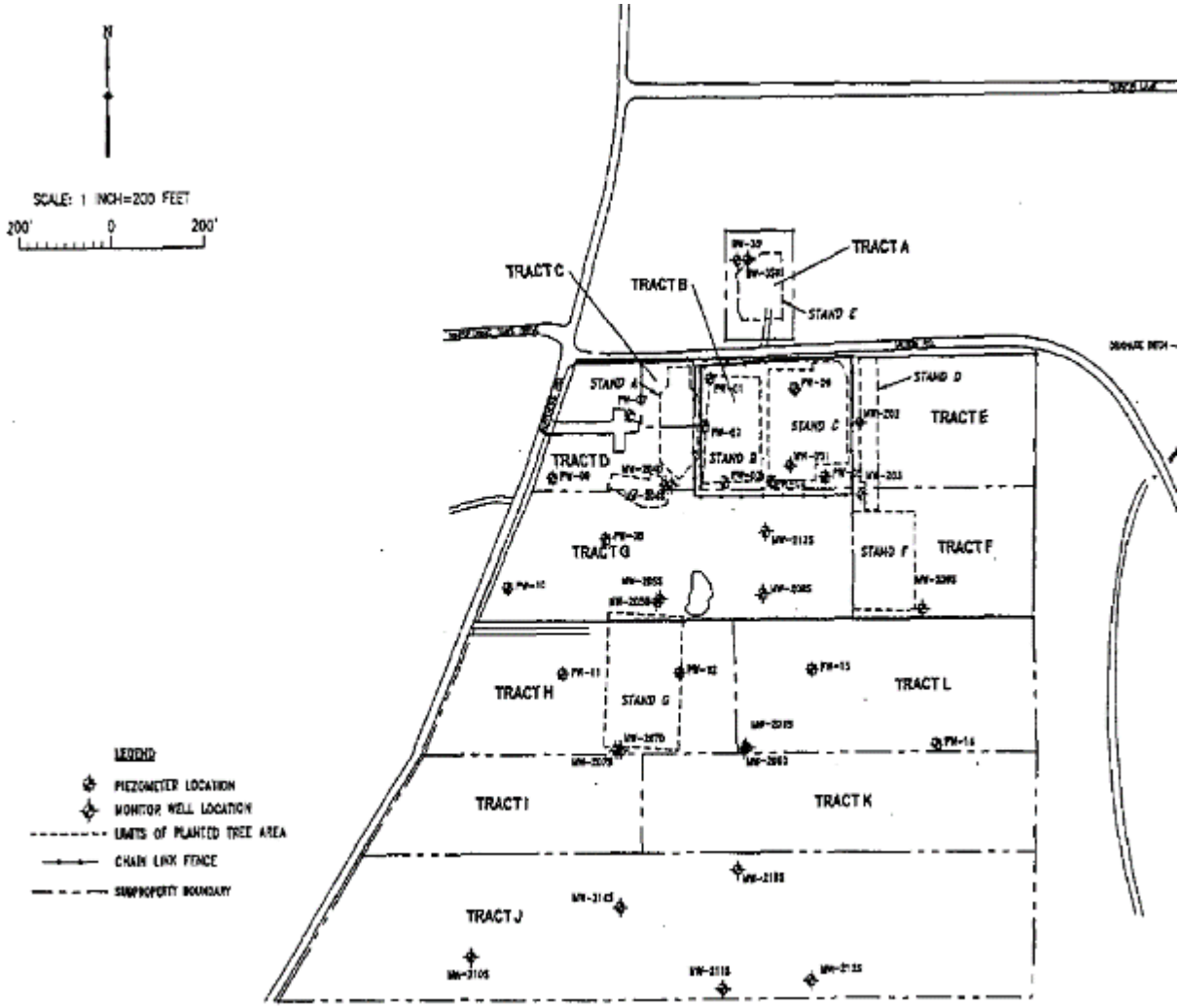


Figure G-5: EDC Plume Shrinkage from 1999 and 2015

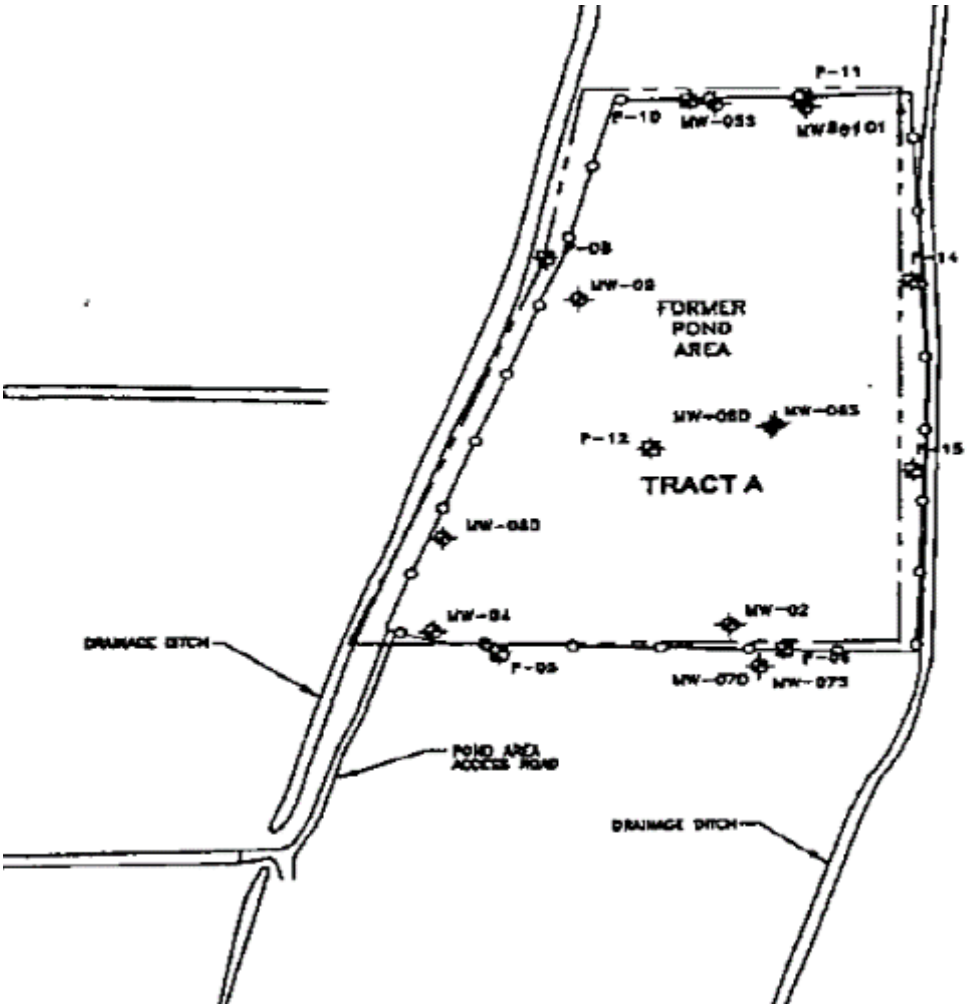


Appendix H: Institutional Controls
Figure H-1: Conveyance Map for the Former Process Area



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

Figure H-2: Conveyance Map for the Pond Area



Appendix I: Removal Action Details and Cleanup Goals

The ERA objective was to remove the principal threat wastes at the Site and dispose of the wastes off site. The PRP listed the cleanup criteria in the November 1992 Final Phase 2 Removal Action Work Plan for the Process Area and the Pond Area (Table I-1).

Table I-1: Removal Action Cleanup Criteria for Soil

COC[a]	Process Area Residential-Based Cleanup Criteria (mg/kg)[a]		Pond Area Industrial-Based Cleanup Criteria (mg/kg)[b]	
	Value	Basis	Value	Basis
Benzene	22	10^{-6} risk	200	10^{-6} risk
Benzo(a)pyrene	0.11	10^{-6} risk	1	10^{-6} risk
Chlorobenzene	5,500	HI =1	40,000	HI =1
Chloroethane	--	--	--	--
Chloroform	110	10^{-6} risk	938	10^{-6} risk
1,1-Dichloroethane	27,000	HI =1	200,000	HI =1
EDC	7	10^{-6} risk	63	10^{-6} risk
1,2-Dichloroethene	2,700	HI =1	20,000	HI =1
1,4-Dichlorobenzene	27	10^{-6} risk	240	10^{-6} risk
Ethylbenzene	27,000	HI =1	200,000	HI =1
Lead	500	Uptake Model	500	Uptake Model
Polychlorinated biphenyls	1	PCB guidance	10	PCB guidance
Styrene	21	10^{-6} risk	190	10^{-6} risk
Tetrachloroethene	13	10^{-6} risk	112	10^{-6} risk
Toluene	55,000	HI =1	400,000	HI =1
Trichloroethene	58	10^{-6} risk	520	10^{-6} risk
Xylenes (mixed)	550,000	HI =1	No Standard	--

Notes:

a. Values obtained from Table 3-2 of the Final Phase 2 Removal Action Work Plan, dated November 1992.

b. Values obtained from Table 3-3 of the Final Phase 2 Removal Action Work Plan, dated November 1992.

HI – noncancer hazard index (HI)

mg/kg – milligram per kilogram

Appendix J: Detailed Evaluation of Exposure Assumptions, Toxicity Data, Cleanup Levels and Remedial Action Objectives (RAO)s

The exposure assumptions used to develop the human health risk assessment are still valid with respect to direct exposure to groundwater. However, indirect exposure to groundwater by inhalation of volatile organic compound (VOC) vapors in indoor air was not previously addressed in the baseline risk assessment. The PRP completed a vapor intrusion evaluation in the 2015 Annual Remedy Effectiveness Report following Louisiana Department of Environmental Quality (LDEQ) guidance. Groundwater VOC results from the former Process Area did not exceed the LDEQ management option 1 (MO-1) groundwater screening criteria for enclosed spaces under non-industrial buildings. However, this analysis was expanded to include EPA's vapor intrusion screening levels (VISLs) for groundwater under a residential and industrial land use. The expanded analysis found several VOCs above the VISLs for groundwater (Table J-1) for both land uses. Institutional controls are in place that preclude use of the former Process Area for residential purposes and there are no habitable structures. However, this evaluation confirms the need for a vapor intrusion evaluation to be conducted using multiple lines of evidence only if future reuse plans involve building of enclosed structures on the former Process Area.

Table J-1: Screening-Level Vapor Intrusion Evaluation

Parameter	2015 Maximum Concentration (mg/L)[a]	LDEQ MO-1 Groundwater Screening Level	EPA VISL (mg/L) (Lower of 10-6 cancer risk or Noncancer HI=1.0)	
		Enclosed Space (mg/L)[b]	Residential	Industrial
1,1,2-Trichloroethane	0.032	8.4	**0.0052**	**0.023**
1,1-Dichloroethane	1.4	140	**0.0076**	**0.033**
1,1-Dichloroethene	0.047	18	0.2	0.82
EDC	1.6	3.6	**0.0022**	**0.0098**
4-Methyl-2-pentanone	0.25	40,000	550	2,300
Benzene	0.051	2.9	**0.0016**	**0.0069**
Carbon disulfide	0.00087	5.3	1.2	5.2
Chlorobenzene	0.0013	440	0.41	1.7
Chloroethane	0.05	5100	23	97
Chloroform	0.0024	1.3	**0.00081**	0.0036
cis-DCE	0.01	13	NE	NE
Ethylbenzene	0.014	2,300	**0.0035**	0.015
Styrene	0.00074	540	9.3	39
Tetrachloroethene	0.00069	15	0.015	0.065
Toluene	19	89	19	81
trans-1,2-Dichloroethene	0.015	14	NE	NE
Trichloroethene	0.0024	10	**0.0012**	0.0074
Vinyl chloride	0.0058	0.2	**0.00015**	**0.0025**
Xylenes (total)	0.023	26	0.49	2.1

Parameter	2015 Maximum Concentration (mg/L)[a]	LDEQ MO-1 Groundwater Screening Level	EPA VISL (mg/L) (Lower of 10-6 cancer risk or Noncancer HI=1.0)	
		Enclosed Space (mg/L)[b]	Residential	Industrial
2,3/3,4-toluenediamine (TDA)	160	NA	NA	NA
TDA	80	NA	NA	NA
o/p-toluidine	2.6	NA	NA	NA

a. Maximum concentrations obtained from the 2015 Annual Monitoring Report, Table A-1.
b. Obtained from Table 11 of the 2015 Annual Monitoring Report
c. Obtained from EPA's VISL Calculator, Version 3.4 and is the lower of the 1 x 10^{-6} level or noncancer HI = 1.0 available at: http://www.epa.gov/oswer/vaporintrusion/documents/VISL-Calculator.xlsm

NA – not considered volatile.
Bold – Maximum concentration in 2015 exceeds EPA's VISL.
d. NE – EPA has not established a VISL for this VOC.

Toxicity values have changed for some of the groundwater COCs, resulting in cleanup goals that may not be stringent enough for potable use of groundwater. As shown in Table J-2, a screening-level risk evaluation of the 2004 Record of Decision (ROD) groundwater cleanup goals identified four groundwater COCs (TDA; 1,1,2-trichloroethane; 1,1-dichloroethane; and cis-DCE) with cleanup goals equal to either a cancer risk greater than EPA's upper bound of the cancer risk management range (1 x 10^{-4}) or a noncancer hazard index (HI) greater than 1.0. The cleanup goal for 1,1,2-trichloroethane equals the current maximum contaminant level (MCL) of 5 µg/L, which EPA considered health protective in March 2010 when EPA completed the six-year review of drinking water standards. However, LDEQ should consider revising the cleanup goals for the remaining three COCs to ensure long-term protectiveness of the remedy. EPA has established an MCL for cis-DCE of 70 µg/L, which is more stringent than the ROD cleanup goal of 518 µg/L. In addition, the LDEQ may consider using the provisional cancer slope factor and inhalation unit risk values established by the California Environmental Protection Agency to confirm if the ROD cleanup goals for TDA and 1,1-dichloroethane should be revised. The groundwater remedy remains protective in the short term because engineering and institutional controls prevent groundwater exposure. In addition, long-term monitoring data indicate that cis-DCE is below the current MCL and below detection in sentinel wells. However, to ensure remedy effectiveness is properly monitored, the cleanup goals for TDA and 1,1-dichloroethane should be re-evaluated to determine if revisions are needed.

Table J-2: Effects of Toxicity Value Changes on the Groundwater Cleanup Goals

COC	Cleanup Goal[a] (µg/L)	Residential RSLs (µg/L)[b]		Screening-Level Risk Evaluation[c]	
		Risk-based (1 x 10^{-6})	HI-based (HI=1)	Risk	HI
TDA	10	0.017[d]	1,100[d]	**6 x 10^{-4}**	0.009
o- and/or p-Toluidine	10	2.5[e]	77[e]	4 x 10^{-6}	0.13
1,1,2-Trichloroethane	5	0.28	0.41	2 x 10^{-5}	**12**
1,1-Dichloroethane	749	2.7	3,800	**3 x 10^{-4}**	0.2
1,1-Dichloroethene	6	NA	280	NA	0.02

COC	Cleanup Goal[a] (µg/L)	Residential RSLs (µg/L)[b]		Screening-Level Risk Evaluation[c]	
		Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI
EDC	5	0.17	13	3×10^{-5}	0.38
Acetone	564	NA	14,000	NA	0.04
Benzene	5	0.45	33	1×10^{-5}	0.15
Chloroethane	28	NA	21,000	NA	0.001
cis-1,2-DCE	518	NA	36	NA	**14**
Methylene chloride	4	12	1,300	3×10^{-7}	0.003
Tetrachloroethene	5	11	41	4×10^{-7}	0.12
Toluene	1,000	NA	1,100	NA	0.91
Vinyl chloride	2	0.019	44	1×10^{-4}	0.04

Notes:

a. Cleanup goals as defined in Table 11 of the 2004 ROD.

b. Values are EPA's tap water RSL for carcinogenic and noncancer effects, available at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm (accessed 6/30/15).

c. Screening level risk evaluation:

Risk = (Cleanup criterion/RSL)(1×10^{-6})

HI = (Cleanup criterion/RSL)

d. No RSL available; used toxicity values from EPA's Provisional Peer Reviewed Toxicity Value data base obtained from http://hhpprtv.ornl.gov/quickview/pprtv.php (accessed 6/30/15).

Used LDEQs 2003 Risk Evaluation/Corrective Action Program (RECAP) formulae equation 41 and 42 for calculating a carcinogenic and noncancer-based GW1 standards, respectively, for TDA as follows:

GW1 cancer (µg/L) $= \frac{\text{(Target Risk x averaging time x days/year x 1000 µg/mg)}}{\text{(Exposure frequency x Oral slope factor x age-adjusted ingestion rate)}}$

$\frac{10^{-6} \times 70 \text{ years} \times 365 \text{ days/year} \times 1000 \text{ µg/mg}}{350 \text{ days/year} \times 3.8 \text{ (mg/kg/day)}^{-1} \times 1.1 \text{ Liter-year/kg-day}} = 0.017 \text{ µg/L}$

GW1 noncancer (µg/L)$= \frac{\text{(Target Hazard Index x body weight x 30 years x days/year x 1000 µg/mg)}}{\text{(Exposure frequency x Exposure duration x (water ingestion rate/RfDoral))}}$

$\frac{1 \times 70 \text{ kilograms} \times 30 \text{ yrs} \times 365 \text{ days/year} \times 1000 \text{ µg/mg}}{350 \text{ ys/year} \times 30 \text{ years} \times (2 \text{ liter/day} / 0.03 \text{ mg/kg/day})} = 1{,}100 \text{ µg/L}$

e. RSL is only available for p-toluidine

Bold – value exceeds a noncancer HI of 1 or cancer risk of 1×10^{-4}

µg/L – milligram per liter

RSL – regional screening level

RG – remedial goal

NA not applicable because chemical has not been classified as a carcinogen.

This FYR also reviewed the soil removal action goals based on human exposure. A screening-level risk evaluation was conducted on the residential-based removal action cleanup goals developed for the former Process Area (Table J-3). The residential-based cleanup goals for chlorobenzene; chloroform; 1,1-dichloroethane; 1,2-dichloroethene; ethylbenzene; toluene; trichloroethene and xylenes exceed 1×10^{-4} cancer risks or a noncancer HI of 1.0. Due to the residential risk and HI exceedances, the residential cleanup goals were also evaluated to determine if they are protective for a future industrial exposure at the former Process Area. As shown in Table J-4, the cleanup goals for chlorobenzene; 1,1-dichloroethane; 1,2-dichloroethene;

ethylbenzene; toluene; trichloroethene and xylenes exceed 1 x 10^{-4} cancer risk or a noncancer HI of 1.0. In addition, the current residential screening level for lead in soil is more stringent than the cleanup goal.

Table J-3: Residential Risk Evaluation of Soil Removal Action Levels at the Former Process Area

COC	Former Process Area Cleanup Criteria (mg/kg)[a]	Residential RSLs (mg/kg)[b]		Screening-Level Risk Evaluation[d]	
		Risk-based (1 x 10^{-6})	Noncancer HI	Risk-based (1 x 10^{-6})	Noncancer HI
Benzene	22	1.2	82	2 x 10^{-5}	0.27
Benzo(a)pyrene	0.11	0.016	--	7 x 10^{-6}	NA
Chlorobenzene	5,500	NA	280	NA	**19.6**
Chloroethane	--	NA	14,000	NA	NA
Chloroform	110	0.32	200	**3 x 10^{-4}**	0.6
1,1-Dichloroethane	27,000	3.6	16,000	**8 x 10^{-3}**	**1.7**
EDC	7	0.46	31	2 x 10^{-5}	0.23
1,2-Dichloroethene	2,700	NA	160[c]	NA	**16.8**
1,4-Dichlorobenzene	27	2.6	3,400	1 x 10^{-5}	0.008
Ethylbenzene	27,000	5.8	3,400	**5 x 10^{-3}**	**7.9**
Lead	500	400[e]		NA	NA
Polychlorinated biphenyls	1	0.23	--	4 x 10^{-6}	NA
Styrene	21	NA	6,000	NA	0.004
Tetrachloroethene	13	24	81	5 x 10^{-7}	0.16
Toluene	55,000	NA	4,900	NA	**11**
Trichloroethene	58	0.94	4.1	6 x 10^{-5}	**14**
Xylenes (mixed)	550,000	NA	650	NA	**846**

Notes:

a. Values obtained from Table 3-2 of the Final Phase 2 Removal Action Work Plan, dated November 1992.

b. Values are EPA's residential RSL for carcinogenic and noncancer effects available at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm (accessed 6/29/15).

c. Value for cis-DCE since it is more stringent than trans-dichloroethene.

d. Screening level risk evaluation:
Risk = (Cleanup criterion/RSL)(1 x 10^{-6})
HI = (Cleanup criterion/RSL)

e. Value based on a biokinetic uptake model
Bold = risk exceeds 1 x 10^{-4} or a noncancer HI of 1.0.

-- criterion not developed for this chemical.

NA not applicable because chemical has not been classified as a carcinogen.

Table J-4: Commercial/Industrial Risk Evaluation of Soil Removal Action Levels at the Former Process Area

COC	Former Process Area Cleanup Criteria (mg/kg)[a]	Commercial/Industrial RSLs (mg/kg)[b]		Screening-Level Risk Evaluation[d]	
		Risk-based (1×10^{-6})	Noncancer HI	Risk-based (1×10^{-6})	Noncancer HI
Benzene	22	5.1	420	4×10^{-6}	0.05
Benzo(a)pyrene	0.11	0.29	--	4×10^{-7}	NA
Chlorobenzene	5,500	--	1300	NA	**4**
Chloroethane	--	--	57,000	NA	NA
Chloroform	110	1.4	1000	8×10^{-5}	0.1
1,1-Dichloroethane	27,000	16	230,000	**2×10^{-3}**	0.1
EDC	7	2	140	4×10^{-6}	0.05
1,2-Dichloroethene	2,700	--	2300	NA	**1.2**
1,4-Dichlorobenzene	27	--	12,000	NA	0.002
Ethylbenzene	27,000	--	20,000	NA	**1.4**
Lead	500	800[e]		NA	NA
Polychlorinated biphenyls	1	0.97	--	1×10^{-6}	NA
Styrene	21	--	35,000	NA	0.001
Tetrachloroethene	13	100	390	1×10^{-7}	0.03
Toluene	55,000	--	47,000	NA	**1.2**
Trichloroethene	58	6	19	1×10^{-5}	**3.1**
Xylenes (mixed)	550,000	--	2800	NA	**196**

Notes:

a. Values obtained from Table 3-2 of the Final Phase 2 Removal Action Work Plan, dated November 1992.

b. Values are EPA's residential RSL for carcinogenic and noncancer effects available at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm (accessed 6/29/15).

c. Value for cis-DCE since it is more stringent than trans-dichloroethene.

d. Screening level risk evaluation:
Risk = (Cleanup criterion/RSL)(1×10^{-6})
HI = (Cleanup criterion/RSL)

e. Value based on a biokinetic uptake model

-- criterion not developed for this chemical.

Bold = risk exceeds 1×10^{-4} or a noncancer HI of 1.0.

NA not applicable because chemical has not been classified as a carcinogen.

A screening-level risk evaluation was conducted on the industrial-based removal action cleanup goals developed for the former Pond Area (Table J-5). The risk evaluation shows that industrial-based cleanup goals for chlorobenzene; chloroform; 1,1-dichloroethane; 1,2-dichloroethene; ethylbenzene; toluene; and trichloroethene at the former Pond Area result in cancer risks exceeding 1×10^{-4} or a noncancer HI of 1.0.

Table J-5: Commercial/Industrial Risk Evaluation of Soil Removal Action Levels at the Former Pond Area

COC	Former Pond Area Cleanup Criteria (mg/kg)[a]	Industrial RSLs (mg/kg)[b]		Screening-Level Risk Evaluation[d]	
		Risk-based (1×10^{-6})	Noncancer HI	Risk-based (1×10^{-6})	Noncancer HI
Benzene	200	5.1	420	4×10^{-5}	0.48
Benzo(a)pyrene	1	0.29	NA	3×10^{-6}	NA
Chlorobenzene	40,000	NA	1,300	NA	**31**
Chloroethane	--	NA	57,000	NA	NA
Chloroform	938	1.4	1,000	**7×10^{-4}**	0.94
1,1-Dichloroethane	200,000	16	230,000	**1×10^{-2}**	0.87
EDC	63	2	140	3×10^{-5}	0.45
1,2-Dichloroethene	20,000	NA	2,300[c]	NA	**1.2**
1,4-Dichlorobenzene	240	11	25,000	2×10^{-5}	0.01
Ethylbenzene	200,000	25	20,000	**8×10^{-3}**	**10**
Lead	500	800[f]		NA	NA
Polychlorinated biphenyls	10	0.97	--	1×10^{-5}	NA
Styrene	190	NA	35,000	NA	0.005
Tetrachloroethene	112	100	390	1×10^{-6}	0.29
Toluene	400,000	--	47,000	NA	**8.5**
Trichloroethene	520	6	19	9×10^{-5}	**27**
Xylenes (mixed)	None[e]	NA	2,800	NA	NA

Notes:

a. Values obtained from Table 3-3 of the Final Phase 2 Removal Action Work Plan, dated November 1992.

b. Values are EPA's June 2015 residential RSL for carcinogenic and noncancer effects available at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm (accessed 6/29/15).

c. Value for cis-DCE since it is more stringent than trans-dichloroethene.

d. Screening level risk evaluation:
Risk = (Cleanup criterion/RSL)(1×10^{-6})
HI = (Cleanup criterion/RSL)

e. Calculated cleanup goal is greater than pure component.

f. Value based on a biokinetic uptake model
-- criterion not developed for this chemical.
NA not applicable because chemical has not been classified as a carcinogen.

Despite the risk and HI exceedances associated with the removal action cleanup goals for the former Process and Pond Areas, the residual contamination in these areas was covered during the 1994 ERA, when the PRP filled excavated areas with compacted clay and a 6- to 12-inch soil cover. To prevent future human exposures to subsurface soil contamination at the former Pond Area, the PRP filed restrictions in the form of land conveyances that restrict land use in this area to industrial/commercial uses and also restrict disturbing the soil. The PRP also filed land conveyances that limit future land use of the former Process Area to industrial/commercial and require the PRP to re-evaluate site conditions if future land use changes from industrial to non-industrial. However, since the removal action goals have been demonstrated to be outdated based on current toxicity information, it is recommended that a decision document requires site conditions be re-evaluated prior to any type of future reuse in the former Process Area.

Appendix K: ARARs Review Tables

Table K-1: Previous and Current ARARs for Groundwater COCs

COC[a]	2004 ROD ARAR or TBC (mg/L)	Current Federal ARAR (mg/L)[b]	Current MO-1 RECAP[c] TBC (mg/L)[c]	ARAR Changes
TDA	0.01	NA	0.01	None
o- and/or p-Toluidine	0.01	NA	0.01	None
1,1,2-Trichloroethane	0.005	0.005	0.005	None
1,1-Dichloroethane	0.749	NA	0.749	None
1,1-Dichloroethene	**0.006**	**0.007**	**0.007**	Less stringent
EDC	0.005	0.005	0.005	None
Acetone	0.564	NA	0.564	None
Benzene	0.005	0.005	0.005	None
Chloroethane	0.028	NA	0.028	None
Cis-DCE	**0.518**	**0.07**	**0.07**	More stringent
Methylene chloride	**0.004**	**0.005**	**0.005**	Less stringent
Tetrachloroethene	0.005	0.005	0.005	None
Toluene	1.00	1.00	1.00	None
Vinyl chloride	0.002	0.002	0.002	None

Notes:

a) COCs as identified in the Site's 2004 ROD.

b) The source for the National Primary Drinking Water MCLs is http://water.epa.gov/drink/contaminants/index.cfm (accessed on 6/9/2015).

c) Value listed is the GW2 value multiplied by the GW1 modification factor unless this product is lower than the GW1 concentration, then the GW1 value is listed (accessed on 6/9/2015). http://www.deq.louisiana.gov/portal/LinkClick.aspx?fileticket=Cmnd59G9eF0%3d&tabid=2932

Bold – ARAR values have changed since the ROD.

NA – not applicable; MCL have not been established for these COCs; the ROD established RECAP values which are TBCs.

Appendix L: Addressing Climate Change

Scientific evidence demonstrates that the climate is changing at an increasingly rapid rate, outside the range to which society has adapted in the past. These changes can pose significant challenges to EPA's ability to fulfill its mission. EPA is therefore anticipating and planning for future changes in climate to ensure it continues to fulfill its mission of protecting human health and the environment, even as the climate changes.

A number of Superfund sites are located in vulnerable areas of Region 6, particularly the Gulf Coast regions of Texas and Louisiana. Rising coastal waters and massive storm surges could potentially flood sites where waste has been capped and left in place. Although most caps and barriers at Superfund sites are engineered to contain waste for many years, the possibility of long-term and extensive flooding, even permanent submersion, could affect the integrity of engineered remedies at some sites where waste has been consolidated and remains in place. There are also active Superfund cleanups expected to be ongoing for many years to come in the vulnerable Gulf Coast areas that will likely be impacted by energy shortages, flooding, storm surges, water shortages and other expected climate change impacts.

In May 2014, EPA's Region 6 Clean Energy & Climate Change Work Group released the Region 6 Climate Change Adaptation Implementation Plan. To address potential challenges posed to Superfund sites by climate change, the plan proposes a process that relies on training, infrastructure enhancements, and constant monitoring and evaluation of indicators that signal climate change in the Region.

In line with this plan, ongoing monitoring at the Site, in conjunction with an awareness of climate change indicators, will help LDEQ, EPA and the PRP group make informed and timely remedial management decisions, if warranted, as they relate to the changing climate.