FIVE-YEAR REVIEW REPORT

FIRST FIVE-YEAR REVIEW REPORT
FOR THE
PETRO-PROCESSORS OF LOUISIANA, INC. SITE
EAST BATON ROUGE PARISH, LOUISIANA

LAD057482713
LDEQ AI# 2469

Approved on December 22, 2005

Prepared by:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

FIRST FIVE-YEAR REVIEW REPORT

Petro-Processors Of Louisiana, Inc. (PPI) Site
East Baton Rouge Parish, Louisiana
LAD057482713

Summary of Findings

The selected remedy includes Monitored Natural Attenuation (MNA), long-term monitoring for a period of 30 years, source control, source reduction, natural recovery and sediment monitoring for a period of 11 years, protective fill placement with inspections for a period of 20 years, and biota monitoring for three years. The Remedial Action (RA) began in 1984 upon approval of a remedial action work plan. Construction complete status was achieved in July 2003. The remedy is in the operation and maintenance phase and is currently protective of human health and the environment.

Actions Needed

NPC Services, Inc. (NPC) is currently operating under approved Work Plans for both the Brooklawn Operating Unit (OU) and the Scenic OU. These work plans are necessary to adequately complete the modeling of Dense Non-Aqueous Phase Liquid (DNAPL) and groundwater at the PPI site, and to address anomalies discovered during remedial investigations. The work plan objectives include an update of the Brooklawn and Scenic OU groundwater flow and solute transport models, further investigation of the +20 Mean Sea Level (MSL) zone at the Scenic OU and a three-dimensional model of DNAPL movement in the subsurface of the Brooklawn OU. The findings of these investigations conducted in accordance with the work plans and any required modification of the remedy, including the Long Range Monitoring Plan (LRMP), will be reported as an addendum to the Remedial Planning Activity (RPA) Report.

Determinations

The remedial actions selected and implemented at the Petro-Processors of Louisiana, Inc., site are protective of human health and the environment.

for John R. Hepola

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

12/22/05
Date

CONCURRENCES

FIRST FIVE-YEAR REVIEW REPORT

Petro-Processors Of Louisiana, Inc. Site
East Baton Rouge Parish, Louisiana

LAD057482713

PRP Agent: NPC Services, Inc. President	William C. Dawson	10-5-2005 Date
Concur By: LDEQ Remedial Project Manager	Thomas L. Stafford	12-09-2005 Date
Concur By: LDEQ Remediation Services Administrator	Keith L. Casanova	12-9-2005 Date
Concur By: EPA Region 6 Remedial Project Manager	Bartolome J. Cañellas (6SF-LP)	12/15/2005 Date
Concur By: EPA Region 6 Site Attorney:	Edwin Quiñones (6RC-S)	12/15/05 Date
Concur By: EPA Region 6 Superfund Branch Chief, Office of Regional Counsel:	Mark Peycke (6RC-S)	12/21/05 Date
Concur By: EPA Region 6 LA/OK Section Chief	Sing Chia (6SF-LP)	12/22/05 Date
Concur By: EPA Region 6 LA/NM/OK Branch Chief:	/s/ Wren Stenger (6SF-L)	12/22/05 Date

FIRST FIVE-YEAR REVIEW REPORT

Petro-Processors Of Louisiana, Inc. Site
East Baton Rouge Parish, Louisiana

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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
BBR	Bayou Baton Rouge
BQL	Below Quantification Levels
CD	Consent Decree
cis-DCE	cis-1,2-Dichloroethene
COC	Contaminants of Concern
DCA	1,2-Dichloroethane
DNAPL	Dense Non-Aqueous Phase Liquids
DOT	Department of Transportation
ESQs	Ecological Screening Quotients
EPA	United States Environmental Protection Agency, Region 6
Federal Court	U.S. Federal District Court, Middle District of Louisiana
HAZMAT	Hazardous Material
HCB	Hexachlorobenzene
HCBD	Hexachlorobutadiene
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
K	Thousand
LDEQ	Louisiana Department of Environmental Quality
LDHH	Louisiana Department of Health and Hospitals
LICR	Lifetime Incremental Cancer Risk
LPDES	Louisiana Pollutant Discharge Elimination System
LRMP	Long Range Monitoring Plan
LTADS	Liquid Treatment and Disposal System
MCL	Maximum Contaminant Level
MM	Million
MNA	Monitored Natural Attenuation
MSL	Mean sea level
NPC	NPC Services, Inc.
NPL	National Priorities List
OU	Operable Unit
OSWER	Office of Solid Waste and Emergency Response
PCE	Tetrachloroethene
PCOR	Preliminary Close Out Report
Plaintiff	U.S. Justice Department
POC	Points of Compliance
POE	Points of Exposure
PPI	Petro-Processors of Louisiana, Inc.
PRPs	Potentially Responsible Parties
RA	Remedial Action
RAOs	Remedial Action Objectives
RME	Reasonable Maximum Exposure

RPA	Remedial Planning Activity
RDCP	Remedial Design and Construction Plans
ROD	Record of Decision
RT3D	Reactive Transport in 3-Dimensions
SARA	Superfund Amendments and Reauthorization Act
Scenic Highway	U.S. Highway 61
SRAP	Supplemental Remedial Action Plan
TCA	1,1,2-Trichloroethane
TCE	Trichloroethene
TeCA	1,1,2,2-Tetrachloroethane
trans-DCE	trans-1,2-Dichloroethene
VC	Vinyl Chloride
VOC	Volatile Organic Compound

Executive Summary

The U.S. Environmental Protection Agency Region 6 (EPA) has conducted this first Five-Year Review for the remedial actions implemented at the Petro-Processors of Louisiana, Inc. (PPI) site located in East Baton Rouge Parish, Louisiana. This first Five-Year Review is being conducted as a policy review at the discretion of EPA Region 6. The PPI site operates under a pre-Superfund Amendments and Reauthorization Act (SARA) Remedial Action (RA) that will leave contaminants onsite above levels that allow for unlimited use and unrestricted exposure. This policy review was triggered upon completion of construction activities at the site, and is intended to evaluate if the selected remedies are protective of human health and the environment.

At sites in which the EPA is the lead agency, the Region may acquire the services of a contractor or establish agreements with other agencies to perform studies, conduct investigations and/or develop draft Five-Year Review reports. Responsible parties may perform certain support activities; however, the EPA retains the final approval authority. This report is the combined effort of the Industry Defendants, represented by NPC Services, Inc., the Louisiana Department of Environmental Quality (LDEQ) and the EPA.

The PPI site, located North of the city of Baton Rouge, which includes the Brooklawn Operable Unit (OU) and the Scenic OU, was operated as a depository for various petrochemical waste products during the 1960s and the 1970s. In July 1980, the U.S. Justice Department (Plaintiff) filed suit against PPI and the Industry Defendants, alleging that they disposed of wastes at the Brooklawn OU and Scenic OU. On February 16, 1984, the U.S. Federal District Court, Middle District of Louisiana (Federal Court) issued an order approving a Consent Decree (CD) for a remedial action at the PPI site. The PPI site is currently being monitored and maintained according to approved remediation plans that are part of the CD. This first Five-Year Review reports on the remedial status and the protectiveness of the remedies at both the Brooklawn and Scenic OUs.

The area surrounding the PPI site is primarily zoned as M-2, heavy industrial. The nearest concentration of residences is the Alsen Community on U.S. Highway 61 (Scenic Highway) about two miles east southeast of the Brooklawn OU and approximately one mile south of the Scenic OU. There are about one-half dozen residential homes on Springfield Road one and one-half miles east of the Brooklawn OU and one-half mile south of the Scenic OU. Land use in the vicinity of the PPI site is largely undeveloped in the bottomlands near the Mississippi River, with some industrial development in the upland areas.

In 1970 a discharge to the Bayou Baton Rouge (BBR) area of Devil's Swamp precipitated a series of legal actions against PPI and its clients resulting in the signing of the CD. The initial response action specified the design of a vault and the complete

closure of the site by excavating, solidifying and land-filling all visible waste along with recovery of deeper waste and treatment by incineration. Air quality monitoring demonstrated releases of Volatile Organic Compounds (VOC) above the previously agreed fence line concentrations. A supplemental investigation was conducted and the Federal Court approved a Supplemental Remedial Action Plan (SRAP). Based on this investigation, a hydraulic containment and recovery option, coupled with incineration was selected as the RA.

Through additional investigations conducted at the site, EPA determined that hazardous substances, including certain Contaminants Of Concern (COC), were found in various site media. COC for the PPI site are: Hexachlorobenzene (HCB), Hexachlorobutadiene (HCBD), 1,1,2,2-Tetrachloroethane (TeCA), 1,1,2-Trichloroethane (TCA), 1,2-Dichloroethane (DCA), Tetrachloroethene (PCE), Trichloroethene (TCE), trans-1,2-Dichloroethene (trans-DCE), cis-1,2-Dichloroethene (cis-DCE), and Vinyl Chloride (VC). The PPI site posed potential threats to human health and the environment through dermal contact with or ingestion of surface soil, groundwater or surface water contaminated with hazardous substances, including certain COC. The site also posed potential threats to human health through inhalation of air and airborne particulate matter contaminated with hazardous substances, including certain COC. Ensuing Work Plans, Remedial Planning Activities (RPA), RPA Reports and Remedial Design and Construction Plans (RDCP) expanded or modified the selected RA as site characterization progressed and new remedial technologies became available.

The current RAs selected and constructed to be protective of human health and the environment are:

1. Source control and protective coverings at the site which have reduced the potential risks associated with ingestion, inhalation, and dermal contact with site contaminants through surface water and sediment pathways for both human and biota receptors.
2. Source reduction at the Brooklawn OU, which is continuing while additional Dense Non-Aqueous Phase Liquids (DNAPL) modeling proceeds for use in updating the groundwater model.
3. Placement of a protective fill in the BBR distributaries has reduced risks that were discovered during EPA commissioned risk assessments.
4. Monitored Natural Attenuation (MNA) remedy for groundwater through implementation of a Long Range Monitoring Plan (LRMP) which has been shown to be protective of down gradient receptors.
5. Sampling of sediments in BBR south of the Scenic OU which has demonstrated that the RA of natural recovery is effective.
6. Finally, administrative controls to limit access to the PPI site which are in place and continue to be effective in limiting entry to approved site personnel.

The remedy at the Brooklawn OU is expected to be protective of human health and the environment upon completion; in the interim, exposure pathways that could result in unacceptable risks are being controlled.

The remedy at the Scenic OU currently protects human health and the environment because the MNA remedy is protective in the short-term. However, in order for the remedy to be protective in the long-term, additional characterization of the +20 Mean Sea Level (MSL) zone and an updated groundwater flow and solute transport model is needed to verify long-term protectiveness. Work plan activities are currently proceeding to address these issues.

Five-Year Review Summary Form

Site name *(from WasteLAN)*: Petro-Processors of Louisiana Inc. (PPI)		
EPA ID *(from WasteLAN)*: LAD057482713		
Region: 6	**State: LA**	**City/County: Baton Rouge / East Baton Rouge Parish**
NPL status: **X** Final g Deleted g Other (specify)		
Remediation status (choose all that apply): g Under Construction **X** Operating g Complete		
Multiple OUs?* **X** YES g NO	**Construction completion date: 07 / 31 / 2003**	
Has site been put into reuse? g YES **X** NO		
Lead agency: **X** EPA g State g Tribe g Other Federal Agency _____		
Author name: Bartolome J. Cañellas		
Author title: Remedial Project Manager	**Author affiliation: USEPA Region 6**	
Review period:** **12 / 06 / 2004** to **10 / 31 / 2005**		
Date(s) of site inspection: LDEQ and EPA inspection conducted on 12 / 02 / 2004.		
Type of review: g Post-SARA **X** Pre-SARA g NPL-Removal only g Non-NPL Remedial Action Site g NPL State/Tribe-lead **X** Regional Discretion (Policy Review)		
Review number: **X** 1 (first) g 2 (second) g 3 (third) g Other (specify) _____		
Triggering action: g Actual RA Onsite Construction at OU #____ g Actual RA Start at OU#____ **X** Construction Completion g Previous Five-Year Review Report g Other (specify)		
Triggering action date *(from WasteLAN)*: 07 / 31 / 2003		
Due date *(five years after triggering action date)*: 08 / 01 / 2008		

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

MNA is the currently approved RA for groundwater contamination at the Scenic OU. However, the investigative activities and accompanying analysis revealed areas of concern. Additional geologic data and monitoring are required. These issues associated with the MNA remedy at the Scenic OU do not affect the protectiveness of the remedy in the short-term.

Fate of DNAPL in the subsurface of the Brooklawn OU is currently under investigation. Once modeled, the extent of DNAPL movement will be incorporated into an updated groundwater flow and solute transport model. This continuing work at the Brooklawn OU does not currently affect the protectiveness of the selected remedy nor will it affect future protectiveness.

Recommendations and Follow-up Actions:

NPC is currently operating under two approved Work Plans for the Brooklawn OU and Scenic OU. These work plans are necessary to adequately complete the modeling of DNAPL and groundwater at the PPI site and to address anomalies discovered during remedial investigations. The work plan objectives include an update of the Brooklawn and Scenic OU groundwater flow and solute transport models, further investigation of the +20 MSL zone at the Scenic OU and a three-dimensional model of DNAPL movement in the subsurface of the Brooklawn OU.

Protectiveness Statement(s):

Brooklawn OU

The remedy at the Brooklawn OU is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

Scenic OU

The remedy at the Scenic OU currently protects human health and the environment because the MNA remedy is protective in the short-term. However, in order for the remedy to be protective in the long-term, additional characterization of the +20 MSL zone and an updated groundwater model is needed to ensure long-term protectiveness.

PPI Site

Source control and protective coverings over former disposal areas at the site have reduced the known risks associated with ingestion, inhalation, and dermal contact with site contaminants through surface water and sediment pathways for both human and biota receptors. Source reduction continues at the Brooklawn OU during additional DNAPL modeling intended to characterize the source term. Placement of a protective fill in the BBR distributaries has reduced risks discovered during risk assessments to acceptable levels. The MNA remedy, through implementation of the LRMP, has been shown to be protective of down gradient receptors. Sampling of sediments in BBR south of the Scenic OU has demonstrated that the RA of natural recovery is effective. Finally, administrative controls to limit access to the PPI site are in place and continue to be effective in allowing entry only to approved site personnel.

Other Comments:

None.

Petro-Processors of Louisiana, Inc. Site
First Five-Year Review Report

I. INTRODUCTION

The U.S. Environmental Protection Agency Region 6 (EPA) has conducted this first Five-Year Review for the remedial actions implemented at the Petro-Processors of Louisiana, Inc. (PPI) site located in East Baton Rouge Parish, Louisiana. This review was conducted from September 2004 through December 2004 and is intended to evaluate whether the selected remedies at the site are protective of human health and the environment. The findings and conclusions of the review are documented in this report.

This first Five-Year Review is being conducted as a policy review at the discretion of EPA Region 6. The PPI site operates under a pre-Superfund Amendment and Re-authorization Act (SARA) Remedial Action (RA) that will leave contaminants onsite above levels that allow for unlimited use and unrestricted exposure. This policy review was triggered upon completion of construction activities that affect the remedy. EPA approved a Preliminary Close Out Report (PCOR) for the PPI site in July 2003.

The PPI site, located North of the city of Baton Rouge, includes the Brooklawn Operable Unit (OU), located off Brooklawn Drive, and the Scenic OU, located off U.S. Highway 61 (Scenic Highway); see Figure 1, Regional Map and Figure 2, Vicinity Map in Appendix G. In the WasteLAN database there are three OUs listed as part of the PPI site, OU #1 is the Brooklawn Disposal Area, OU #2 is the Bayou Baton Rouge Area and OU #3 is the Scenic site. In accordance with the Consent Decree (CD), OU #1 and OU #2 are combined to form the Brooklawn site and are referred to hereafter as the Brooklawn OU. The Brooklawn OU and the Scenic OU, which include portions of Bayou Baton Rouge (BBR) and Devil's Swamp, have been investigated, remediated as necessary, and are currently being monitored and maintained according to approved remediation plans. This first Five-Year Review reports on the remedial status and the protectiveness of the remedies at both the Brooklawn OU and Scenic OU.

II. SITE CHRONOLOGY

PPI operated the Brooklawn and Scenic sites as depositories for various petrochemical waste products during the 1960s and the 1970s. In July 1980, the U.S. Justice Department (Plaintiff) filed suit against PPI and Industry Defendants, alleging that they disposed of wastes including hazardous substances at the Brooklawn OU and Scenic OU. On February 16, 1984, before the PPI site was added to the National Priorities List (NPL), the U.S. Federal District Court, Middle District of Louisiana (Federal Court) issued an order approving the CD (NPC 1984a) for a remedial action at the PPI site. As provided for in the CD, the Industry Defendants designated a remedial plan coordinator, NPC Services, Inc. (NPC), to carry out these activities.

EPA proposed the site to the NPL on September 8, 1983 (40674 - 40682 Federal Register / Vol. 48, No. 175), and added it to the final list on September 21, 1984 (37070 - 37082 Federal Register / Vol. 49, No. 185) NPL Update: No. 1.

EPA approved an Interim RA for the Scenic OU in November 2001 (NPC 2001c), and for the Brooklawn OU in July 2003 (NPC 2003a). A Preliminary Close Out Report (PCOR) was approved also in July 2003 (NPC 2003b).

Table 1 presents a chronology of significant events for the PPI site.

III. BACKGROUND

Physical Characteristics

The Brooklawn OU is located in East Baton Rouge Parish on Brooklawn Drive approximately one and one half miles west of Scenic Highway. The Brooklawn OU covers approximately 80 acres and includes the Disposal area and the adjacent BBR area (see Drawing BK-99-151). The Brooklawn OU has ground surface elevations ranging from approximately 35 feet Mean Sea Level (MSL) along the floodplain of the Bayou Baton Rouge area to an elevation of approximately 75 feet on top of the bluff which borders the northern portion of the site. Former disposal areas include lagoons in the batture area and pits in the bluff area. The Brooklawn disposal area has a minimum elevation of approximately 55 feet MSL. The stratigraphical investigation shows that the site is divided into either Pleistocene terrace or Recent alluvial deposits. Stratigraphically significant permeable zones within the Pleistocene deposits include the Pleistocene water table, the -40 MSL zone, the Intermediate Sand, and the 400-foot Aquifer. Permeable zones within the Recent alluvial deposits include the shallow and deep water tables and the semi-confined alluvial zone (Figure 3, Brooklawn OU Conceptual Model).

The Scenic OU is located in East Baton Rouge Parish on the west side of Scenic Highway approximately one-quarter mile north of the intersection of US Highway 61 and State Highway 964. The Scenic OU was a borrow pit for the construction of the overpass at the intersection of US Highway 61 and LA State Highway 964. The disposal area of Scenic OU covers approximately 17 acres and includes a portion of BBR, which was located immediately adjacent to the western end of the waste pit (see Drawing SC-02-100). The stratigraphy beneath the Scenic OU includes a +40 MSL zone, +20 Channel Deposit, -40 MSL zone, Intermediate Sand and the 400-foot Aquifer.

Land and Resource Use

The area surrounding the PPI site is primarily zoned as M-2, heavy industrial. Industrial facilities include: Great Lakes Carbon Corporation, Exide, and Kansas City Southern Railway. The nearest concentration of residences is the Alsen Community on Scenic Highway about two miles east southeast of the Brooklawn OU and approximately one mile south of the Scenic OU. There are about one-half dozen residential homes on Springfield Road one and one-half miles east of the Brooklawn OU and one-half mile south of the Scenic OU. The East Baton Rouge city/parish landfill is about one mile north northeast of the Brooklawn OU and one mile northeast of the Scenic OU. Jetson Correctional Facility for adolescents is two miles east of the Brooklawn OU and one-half mile southeast of the Scenic OU. The Joint Emergency Services Training Center operated by the Louisiana State Police is located one-half miles northwest of the Brooklawn OU.

Land use in the vicinity of the PPI site is largely undeveloped in the bottomlands near the Mississippi River, with some industrial development in the upland areas; see Figure 1, Regional Map. Most residents in the area are connected to the Baton Rouge Water Supply system. There is one domestic water well in the 400-foot aquifer within one-half mile of the Scenic OU. There are no domestic wells within one-half mile of the Brooklawn OU. The CD identified the 400-foot Aquifer as an aquifer of concern to be protected from infiltration of contaminants originating from the pits and lagoons located on these OUs. None of the 400-foot Aquifer monitor wells have indicated the presence of contaminants. In addition to monitoring, the Potentially Responsible Parties (PRPs) have conducted an evaluation of site geology and groundwater modeling to assess the potential contamination to this aquifer. Current geochemical conditions favorable to MNA and clay layers are protecting this aquifer from contamination.

History of Contamination

PPI operated the Brooklawn OU and Scenic OU as depositories for various petrochemical waste products containing hazardous substances during the 1960s and the 1970s. The Scenic OU received petrochemical waste containing hazardous substances from 1961 to 1974. The Brooklawn OU operated from approximately 1969 to 1978. An estimated 300 K tons of waste were deposited during operations conducted by PPI. This approximate amount includes 125 K tons of solids, 64K tons of sludge and 125 K tons of liquid waste, of which, 52 K tons were non-chlorinated organic liquids, 63 K tons were chlorinated organic liquids and 10 K tons were aqueous liquids. In 1970 a discharge to the BBR area of Devil's Swamp precipitated a series of legal actions against PPI and its clients resulting in the signing of the CD in Federal Court on February 16, 1984.

Site characterization activities performed during the Brooklawn OU investigation included the completion of 537 soil borings, 119 push tubes, 236 core barrels, and 41 vibracores. In addition, 45 sediment, 31 soil, 27 surface water, and 368 groundwater samples were collected and analyzed for potential hazardous substances and Contaminants Of Concern (COC). These activities were completed to define site stratigraphy and assess the nature and extent of free phase and dissolved contamination at the Brooklawn OU presented in Drawing BK-99-121. Site conditions were further characterized during installation of 192 recovery wells.

Additional waste characterization data specific to the Brooklawn OU became available in risk assessments commissioned by EPA (EPA contract number 68-W4-0016; Ecological Risk Assessment, December 6, 1999, and Human Health Risk Assessment December 8, 1999, Devil's Swamp, Baton Rouge, Louisiana). The study area for these risk assessments included the BBR distributaries.

A waste characterization investigation program was completed at the Scenic OU and presented to EPA in Addendum D, Volume 4, to the Remedial Planning Activities (RPA)

Report (NPC 1998). The RPA delineated the areal and vertical extent of contamination (see Drawing SC-02-820 and SC-02-821) within the shallow sands above the -40 MSL zone, provided characterization of geotechnical and hydrogeological properties, further definition of site stratigraphy and identified the extent of contamination in BBR. The program included completion of 93 soil borings, 136 groundwater samples, 18 push tubes, 16 vibracores, 51 piezometers, and three test wells. Samples of BBR water, sediments and biota were obtained from 18 stations adjacent to the Scenic OU. Investigations at the Scenic OU revealed the migration of dissolved contamination containing hazardous substances laterally away from the waste pit and vertically through a channel in the base of the +40 MSL zone into the underlying more transmissive +20 MSL channel deposit. Once within the +20 MSL channel deposit, dissolved organic contaminants had migrated via groundwater flow gradients west (1500') and, to a lesser extent, east (500') from the pit area. Neither free phase organics nor dissolved contamination was detected in any of the site borings completed within the -40 MSL zone, Intermediate Sand, or 400-foot aquifer. Analysis of BBR surface water, biota and sediment revealed the presence of the semi-volatiles Hexachlorobenzene (HCB) and Hexachlorobutadiene (HCBD) and Volatile Organic Compounds (VOC) including 1,1,2,2-Tetrachloroethane (TeCA), 1,1,2-Trichloroethane (TCA), 1,2-Dichloroethane (DCA), Tetrachloroethene (PCE), Trichloroethene (TCE), trans-1,2-Dichloroethene (trans-DCE), and Vinyl Chloride (VC).

Initial Response

The CD specified that plans include the siting and design of a vault in accordance with 1984 RCRA regulations and the complete closure of the PPI site by excavating, solidifying and land-filling all visible waste along with pumping deeper waste and treatment by incineration. The vault was built and waste solidification activities began at the Brooklawn OU in late 1987. During these activities, air quality monitoring demonstrated releases of VOC above the previously agreed fence line concentrations. At that time it was determined that closure could not proceed under the approved plan. A supplemental investigation was conducted in 1988, and the Federal Court

approved the Supplemental Remedial Action Plan (SRAP) (NPC 1989b) on August 31, 1989. Based on this investigation, a hydraulic containment and recovery option, coupled with incineration was selected as the RA.

Basis for Taking Action

Through investigations at the PPI site, EPA determined that hazardous substances, including certain COC were found in various site media as presented in Table 2. The PPI site posed potential threats to human health and the environment through dermal contact with or ingestion of surface soil, groundwater or surface water contaminated with the hazardous substances and COC. The site also posed potential threats to human health through inhalation of air and airborne particulate matter contaminated with hazardous substances, including certain COC. The selection of remedies and the RA that have been implemented to reduce, eliminate and monitor all known risks are reported in Section IV of this report.

IV. REMEDIAL ACTIONS

Remedy Selection

The CD included a Conceptual Closure Plan designed to guard against contamination of the regionally significant 400-foot aquifer. The CD outlined various activities for the Industry Defendants to investigate, develop, design, and implement remedial actions to effect closure of the PPI site. The 1984 CD became the framework for subsequent Work Plans, the RPA, RPA Reports, Supplemental Remedial Action Plan (SRAP) and Remedial Design and Construction Plans (RDCP) that were developed specifically for the Brooklawn and Scenic OU. Each approved document is incorporated by reference and has become part of the CD.

A remedial action work plan was submitted and approved in 1984. Closure of the PPI site according to the original RA was prohibited due to problems encountered during implementation (see Initial Response). A supplemental investigation was conducted in 1988 resulting in the selection of a hydraulic containment and recovery option, coupled with incineration as the RA. Ensuing Work Plans, RPA, RPA Reports and RDCP expanded or modified the selected RA as site characterization progressed and new remedial technologies became available.

Brooklawn OU

In 2001, Addendum A to the Brooklawn RPA Report, Volume 4, defined all known exposure pathways, documented the remedial actions that were implemented to eliminate exposure pathways (see Remedy Implementation) and proposed RA for the remaining exposure pathways. The principal objectives presented in Volume 4, Waste Processing and Risk Based Remedial Action, were to:

1. Identify potential contaminant pathways to human and ecological receptors.
2. Evaluate pathways and, if complete, quantify the risk.
3. Develop a remedial plan to reduce any unacceptable risks to levels that are protective of human health and the environment.
4. Develop a comprehensive long-range monitoring plan to measure the efficacy of the remedial action.

The RPA Report (NPC 2001b) concluded that two exposure pathways existed requiring further remedial action. These exposure pathways were (1) surface materials in Bayou Baton Rouge sediments contaminated with HCB and HCBD immediately south of the Brooklawn OU and (2) groundwater below the Brooklawn OU contaminated with TeCA, TCA, DCA, PCE, TCE, cis-DCE, trans-DCE, and VC.

EPA conducted a comprehensive Human Health Risk Assessment (HHRA) (EPA 1999b) in Devil's Swamp that concluded only HCB and HCBD in crawfish produced a significant risk to human health. Receptor modeling for the Brooklawn OU was conducted using Reactive Transport in 3-Dimensions (RT3D), a transport model for simulation of advection, dispersion and chemical reactions of contaminants in groundwater systems. A predictive simulation of 30 years was performed to model any impacts that may occur to the 400-foot aquifer based on the "present day" (year 2000) distribution of dissolved COC. Results of the RT3D receptor modeling at the Brooklawn OU demonstrated that the contaminant plume would reach equilibrium through natural attenuation within the model period without affecting sensitive receptors. The results of this modeling were reported in Addendum A to the RPA Report (NPC 2001b). In 2001 the EPA and the Louisiana Department of Environmental Quality (LDEQ) approved Addendum A to the RPA. This resulted in the selection of Monitored Natural Attenuation (MNA) and source reduction for groundwater contamination and the placement of a protective fill in the Middle Channel of the BBR area distributaries (Drawing 020-C-339 rev 2) as the RA. Included, as part of the RA, is a Long Range Monitoring Plan (LRMP). The LRMP for the Brooklawn OU includes the following objectives:

1. For at least 30 years, monitoring the contaminant plume and geochemical parameters in the subsurface to evaluate the effectiveness of the natural attenuation process;
2. For 20 years, inspection of the Bayou Baton Rouge fill material to assure continued conformance with performance requirements;
3. For at least 3 years, collection and analysis of crawfish from the Bayou Baton Rouge Channels and North Swamp sub-areas to assure the success of the remedial action; and

4. For at least 30 years, protect the identified down gradient Points of Exposure (POE) (the Mississippi River) through monitoring sentry POE wells for the appearance of site COC.

The current selected remedial actions at the Brooklawn OU are:

1. Source Reduction in the disposal area.
2. Protective Fill and Biota Monitoring in the Middle Channel of the Bayou Baton Rouge area distributaries.
3. Monitored Natural Attenuation of contaminated groundwater.
4. Administrative Controls.

Scenic OU

Addendum D to the RPA Report (NPC 1998) at the Scenic OU, presented the following principal objectives:

1. Develop a conceptual remedial design for the Scenic OU.
2. Develop a conceptual model of the Scenic area hydrogeologic conditions.
3. Develop a solute transport model to assess potential impacts on the 400-foot aquifer.
4. Evaluate the potential for natural attenuation of dissolved organic constituents in the +40 MSL zone and the +20 MSL channel deposit.
5. Develop a risk-based remedial program for Bayou Baton Rouge sediment contamination downstream of the Scenic OU, and for natural attenuation of the dissolved organic constituents in the +40 MSL zone and the +20 MSL channel deposit.
6. Document these objectives in a report presenting the conceptual design and remedial action.

To complete the stated objectives, receptor modeling was conducted using a modular three-dimensional transport model (MT3D) for simulation of advection, dispersion and chemical reactions of contaminants in groundwater systems (NPC 1998). A predictive simulation of 500 years was performed to model any impacts that may occur to the 400-foot aquifer based on the "present day" (year 1997) distribution of dissolved COC. Results of the MT3D receptor modeling at the Scenic Site demonstrated that contamination would not reach the 400-foot aquifer.

Additional remedial investigations based on the objectives outlined in Addendum B to the Work Plan (NPC 2001a) were conducted. The findings and proposed modifications

to the selected RA were reported in Addendum E to the RPA Report (NPC 2003). The proposed modifications to the remedy were reviewed by EPA and approved for implementation. These modifications included termination of active recovery (source reduction) and modifications to the LRMP for the MNA component.

The current selected remedial actions at the Scenic OU are:

1. Source Control in the disposal area.
2. Natural Recovery of Bayou Baton Rouge sediment.
3. Monitored Natural Attenuation of contaminated groundwater.
4. Administrative Controls.

Remedy Implementation

In order to implement the hydraulic containment and recovery RA selected in SRAP (NPC 1989), both the Scenic OU and the Brooklawn OU were filled and graded. This RA also provided a clean surface for storm water drainage and discharge through permitted Louisiana Pollutant Discharge Elimination System (LPDES) outfalls (Permit No. LA0066214) at both OU. Backfill was applied to provide protection from flooding and portions of BBR were rerouted as needed. Comprehensive groundwater modeling was performed. Based on the results of the modeling, an extensive system of recovery wells and support facilities was designed and built for the Brooklawn OU. This included facilities for the collection, separation and treatment of DNAPL and associated contaminated groundwater. In 1996, the Louisiana Department of Health and Hospitals (LDHH) conducted a public health assessment (LDHH 1996) of the PPI site, which indicated the site neighbors were not experiencing a higher cancer rate than the rest of East Baton Rouge Parish. At the Scenic OU a system of recovery wells, collection and support facilities were built in 2000. Administrative control of the PPI site was achieved by providing perimeter fencing and security.

Brooklawn OU

In accordance with the Remedial Planning Activities Report (NPC 1985), and to reduce surface material contamination exposure, 700 feet of the easternmost BBR distributary

channel was remediated in 1990 by excavation. The remediated portion is the southernmost 700 feet along the South Access Road and is depicted on Drawing BK-99-152. In 1991 the Brooklawn OU disposal area was covered with two feet of clay, protective cover and six inches of topsoil (seeded and mulched for erosion control) to provide a suitable working surface, eliminate vapor emissions and exposure to contaminated soils. Additionally, a segment of BBR was diverted away from the disposal area to allow for natural drainage to continue through uncontaminated areas.

In 1994, the upper lagoon was filled and a protective cover was installed. During the filling of the upper lagoon, 800 tons (140 K gallons) of DNAPL were recovered and shipped offsite for incineration.

After the Brooklawn OU protective cover was completed, a system of recovery wells (192) and collection sumps (98) were installed in the disposal area. This recovery system provided hydraulic containment of the contaminated groundwater. During operation of this system, through October 2004, 136 MM gallons of contaminated water and 800 K gallons of DNAPL have been recovered. Recovery system production data is presented in Table 3. Currently, wells not producing further DNAPL are being terminated and abandoned (Plug and Abandon) in accordance with an approved RDCP (NPC 2002).

A Liquid Treatment and Disposal System (LTADS) was placed in service during 1994 to treat liquids produced from the recovery wells and collection sumps. This system included separation, storage, air stripping, incineration, and water treatment facilities. The LTAD incineration and air stripping system operated until September 2000, when declining free phase organic production made onsite incineration impractical. During operation of the LTAD incinerator, 2.25 K tons (412 K gallons) of free phase organics were treated. Additionally, 114 MM gallons of recovered contaminated groundwater were processed through the air stripper and the organic vapors were incinerated (Photograph 14, Appendix F). This water was then treated with activated carbon and discharged to the Mississippi River through an LPDES permitted outfall.

Addendum A to Volume One of the RDCP (NPC 2002), specified the installation of two additional sentry monitor wells in the 400-foot aquifer down gradient of the contaminant plume to assist in measuring the performance of the MNA remedy. The LRMP, approved in Addendum A to the RPA Report (NPC 2001b), was designed consistent with the requirements of the CD and the current Office of Solid Waste and Emergency Response (OSWER) guidance on MNA at Superfund sites. Groundwater monitoring samples are collected at twenty-six locations (Drawing BK-99-150) to determine COC concentrations along transects parallel with the dominant migration pathway. Sentry Points of Compliance (POC) wells at the expected plume boundaries are monitored to assess the extent of plume migration. Additionally, geochemical data is collected to verify that conditions favorable for natural attenuation continue to occur in the aquifer and hydraulic head data is collected to aid in interpreting chemical data.

The selected remedy for the BBR area sediments and biota, south of the Brooklawn disposal area, was the placement of a protective fill in a distributary channel (Drawing 020-C-339 rev 2). This final remedial construction activity was completed in January 2003; a total of 3,045 feet of the channel was filled with 9,888 cubic yards of material. The LRMP requires the collection and analysis of Biota (crawfish) samples from 15 locations and annual monitoring of the integrity of the protective fill. Crawfish serve as a sentinel organism for ecological inputs and are analyzed for HCB and HCBD.

Scenic OU

The Scenic OU has been covered with two feet of clay protective fill and six inches of topsoil (seeded and mulched for erosion control) to provide a suitable working surface, eliminate exposure to impacted soils and to provide for clean surface water drainage. Fill was placed to reinforce the existing dikes at the closed waste pit. Two segments of BBR were diverted away from the waste pit as a part of the overall site development. The site is fenced and security is provided.

In 1999, upon approval of Addendum D (NPC 1998), the selected RA for the disposal area was source reduction with MNA. Source reduction included the removal of mobile DNAPL by pumping recovery wells placed in the waste pit (Photograph 20, Appendix F). The removal of DNAPL required preparation and development of the site and construction of a recovery system (wells, collection network, electrification, instrumentation, a control room, a covered, diked loading area and service roadways). Eleven recovery wells were pushed through the cover into the disposal pit. Based on an evaluation of core samples, it was determined that seven of these wells were capable of producing DNAPL. Above ground structures and pumps associated with each of the seven wells were installed. Recovered liquids were pumped to a DOT trailer mounted tank. The tank was kept in a covered, bermed area during filling. Alarms interfaced with pump controllers were programmed to shut down the recovery well field if a high level occurred in the storage tank. The DNAPL was transported approximately two miles to the Brooklawn OU for treatment. Transport was on public thoroughfares utilizing a Department of Transportation (DOT) Hazardous Material (HAZMAT) driver and vehicle operated and maintained by NPC. The well field was mechanically complete on January 11, 2000. The first shipment of waste material was on February 10, 2000. DNAPL production from the recovery system totaled 3,900 gallons. Contaminated groundwater recovered totaled 6,400 gallons. Active recovery (source reduction) was terminated at the Scenic OU (see Remedy Selection, Scenic OU) on August 21, 2003.

NPC has conducted the necessary modeling to define MNA and its effectiveness as a part of the overall remedial strategy. Field and laboratory studies have shown that microorganisms degrade site contaminants under aerobic and anaerobic conditions and that the natural attenuation processes can provide effective reduction of the soluble contaminants. MNA requires periodic sampling and analysis of an array of monitor wells outside the contaminant plume and an array of piezometers both inside and outside the contaminant plume. A Post-Construction Monitoring plan has been designed consistent with the requirements of the CD and the current OSWER guidance on natural attenuation at Superfund sites. The monitoring plan utilizes 15 monitor

wells currently in service. The monitoring plan also employs twenty new piezometers that were installed in the +40 MSL zone, the +20 Channel Deposit, and the -40 MSL zone. Seven additional piezometers also used in the monitoring plan were installed in the Intermediate Sand and the 400-foot Aquifer.

Natural Recovery was selected for remediation of Bayou Baton Rouge sediments south of the Scenic OU. Investigations of surface water, biota and sediments in the bayou have revealed the presence of HCB and HCBD in surface sediments. The general lack of unacceptable risks along with other factors allowed the selection of Natural Recovery. These other factors included poor accessibility, the low volume of water normally present and no commercial or sport fishing in the affected portion of the bayou.

Site Wide Remedy Implementation

The current approved remedies for the PPI site are described in Addendum A (NPC 2001b) to the RPA Report (Brooklawn OU) and Addendum E Report (NPC 2003e) to the RPA (Scenic OU). These remedies include MNA for groundwater contamination along with source reduction at the Brooklawn OU, source control at the Scenic OU, natural recovery of sediments at the Scenic OU, and protective Bayou Baton Rouge channel fill at the Brooklawn OU.

With the completion of physical facilities, a post-construction monitoring plan has been implemented to monitor the groundwater including the 400-foot aquifer to ensure model predictions are correct. The monitoring plan also evaluates natural recovery of the bayou adjacent to the Scenic OU, natural attenuation at both OUs, and success of the remediation and recovery of the BBR channel area. The CD recognizes the potential for contingencies to occur and the need to address them through the development of remedial alternatives. The post-construction monitoring plan will provide ample warning of the threat of releases of hazardous substances that may present a concern.

Appendix C, Progress Reports, contains a letter (dated August 14, 2002) addressed to Judge F. J. Polozola from NPC, which detailed the remedial progress at PPI Site. Included in Appendix C are letters of concurrence from both EPA and LDEQ.

System Operation/Operation and Maintenance

As the Petro-Processors of Louisiana, Inc. Site was a PRP funded cleanup, the funding information is not publicly available.

In consideration of the entry for the Consent Decree, defendants agreed not to make any claims pursuant to Section 112 of CERCLA, 42 U.S.C. Section 9612, directly or indirectly against the Hazardous Substance Response Trust Fund established by the Act for expenses related to this case and the CD.

The Environmental Protection Agency, Hazardous Substance Response Trust fund received $600,000 as consideration for compromise by the United States of its claims for all costs previously incurred by it in investigating and responding to conditions at the sites. The State of Louisiana, Bond Security and Redemption Fund received $30,500 as consideration for compromise by the State of Louisiana of its claims for all costs previously incurred by it in investigating and responding to conditions at the sites.

V. FIVE-YEAR REVIEW PROCESS

Mr. Bartolome J. Canellas, EPA Project Manager Region 6, led this first Five-Year Review. The process consisted of a review of relevant site documents, site data, an Applicable or Relevant and Appropriate Requirements (ARARs) review, interviews, public notice and a site inspection. Each of these review processes were conducted for both the Brooklawn OU and Scenic OU.

Document Review

A list of the relevant documents that were reviewed is presented in Appendix A. Documents reviewed consisted of approved site work plans, remedial planning documents, monitoring reports and EPA commissioned risk assessments.

Public notice of this Five-Year Review was published in the local newspaper, and a Five-Year Review fact sheet was distributed to the mailing list maintained for the site. These public notices are presented in Appendix B. A copy of the completed report will be available in the public library at the PPI site located at 2401 Brooklawn Drive in Baton Rouge, Louisiana and through EPA Region 6 and LDEQ.

Appendix D contains a concurrence letter from the Louisiana DEQ stating their findings from the (ARARs) review.

Interviews

Appendix E contains the completed site survey forms (site interviews) and a listing of those who were interviewed. These interviews were conducted by mail. Responses were received from LDEQ personnel, LSU professors who served in the past as court appointed experts, technical personnel associated with the groundwater and DNAPL modeling efforts, the PPI site Facility Manager and a representative of a neighboring industrial facility. There were no negative comments or concerns associated with the remedial activities of the site.

Site Inspection

On December 2, 2004 representatives of EPA and LDEQ conducted an inspection of the PPI site. The inspection assessed the conditions of the physical facilities, site administrative controls and visible implementations of the remedies. Protective coverings at both OUs were in good condition and appropriate signs were posted on security fencing. The site inspection checklist is presented in Appendix H. Photographs that were taken during the site inspection are included in Appendix F.

Data Review

Groundwater monitoring results at both OUs indicate that the MNA remedy is protective. All COC concentrations at sentry POC wells located down gradient of the primary migration pathway are Below Quantitative Levels (BQL). The data demonstrates that no short-term risk exists that the contaminant plume will migrate unacceptably.

Inspections of protective coverings in the former disposal areas and in BBR distributaries reveal no integrity concerns. Biota monitoring also confirms the effectiveness of the protective fill remedy. Tables 4 and 5 display the results of biota analysis and Hazard Indices (HI) that were calculated from crawfish collected during the 2003 LRMP at the Brooklawn OU. The combined (HCB and HCBD) Lifetime Incremental Cancer Risk (LICR) from Table 4 is 3E-05, which is within the risk management range where additional RA is not normally required. The combined HI displayed in Table 5 is 0.2, which also is protective.

Table 6, reproduced from Table 4-3 in the Ecological Risk Assessment (EPA 1999), provides Hazard Quotients (HQs) for crawfish in western channels, eastern channels, and the transition swamp. For HCB, the highest HQs are 7.4, 6.2, and 6.4, respectively. For HCBD, the highest HQs are 23.6, 12.8, and 21.3, respectively. None of the data shown in Table 7, Potential Ecological Screening Quotients (ESQs) Associated with 2003 Crawfish Concentrations, exceed 1. These results demonstrate

the effectiveness of the RA regarding contaminated sediments in BBR distributaries. The protective fill is stable, functioning as intended, and is protective of human health and the environment.

Source reduction is proceeding at the Brooklawn OU. Sediment sampling in BBR south of the Scenic OU shows that no risks are unacceptable. Finally, all data indicates that administrative controls are adequate.

VI. TECHNICAL ASSESSMENT

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

Yes. A review of site-specific data and the results of the inspection documented in this report demonstrate that the remedy is functioning as intended by the approved RPA Reports. Stabilization of the disposal pits, diversion of BBR and placement of protective covers at the PPI site have achieved the remedial objectives to control vapor emissions from and dermal contact with contaminants in soil and sediments. Ecological and human health risks have been reduced to acceptable levels in the BBR distributaries portion of the Brooklawn OU through the placement of a protective fill.

Based on a review of recent groundwater sampling and analytical data, MNA at the Brooklawn OU appears to be containing the dissolved contaminant plume. The contaminant plume at the Brooklawn OU has not and is not expected to migrate to the defined down gradient POE for the groundwater source, the Mississippi River. Groundwater modeling indicates that the contaminant plume will stabilize before migrating beyond the property wholly owned by NPC. To ensure containment of the plume, point of compliance (POC) monitoring locations have been installed. Figure 4, Groundwater Sample Locations, show the locations of these sentry wells. The data indicates that all COC concentrations at the sentry POC wells do not exceed the Maximum Contaminant Level (MCL). Groundwater at the Scenic OU is also monitored using sentry wells located at the plume boundary to verify that COC migration does not exceed the transport model predictions. Two sentry wells, SBP-69-B and SDG20-2, located down gradient of the groundwater source remain absent of all COC see Drawing SC-02-100. Monitoring data and modeling at the Scenic OU indicates that the approved MNA remedy is functioning as intended and is protective in the short-term. NPC is currently operating under an approved Work Plan for the Scenic OU to investigate and characterize the geology along the dominant migration pathway. While this supplemental work is progressing, no short-term risk exists that the plume will migrate unacceptably. During this investigation at the Scenic OU additional POC

monitoring locations have been installed to detect plume migration.

Operation and maintenance of the facility, as indicated in the site inspection (Appendix H), has been effective in maintaining the integrity of the protective coverings at both the Brooklawn OU and Scenic OU, see Photographs 29 –36. The PPI site is inspected daily by site personnel and maintenance items are noted and corrective actions are taken as needed. The filled and graded former waste disposal areas have sufficient grass coverings and are frequently mowed to prevent unwanted shrub growth. Requirements of the Brooklawn OU long range-monitoring plan specify the inspection of the protective fill in the BBR distributaries channels to ensure its integrity. During the last inspection, November 2004, vegetation was well established, and there was no noted erosion of any fill areas. However, three small soft areas of the filled channel showed shallow wheel tracks. These areas appear to be slightly lower than the surrounding grade and are soft spots due to moisture but are no concern to the fills integrity. Additional fill is planned for placement in these low areas.

During the 2002 hurricane season, Louisiana was affected by three tropical storms and two hurricanes. These tropical weather systems produced over 15 inches of rainfall at the PPI site. Hurricanes Isidore and Lili made landfall in Louisiana on September 25, 2002 and October 3, 2002, respectively. During this short period the PPI site received over 8 inches of rain, which is 13% of the yearly average for Louisiana. This heavy rainfall was discharged through LPDES storm water outfalls or contained and treated. Existing facilities at the PPI site were capable of handling these significant rainfall events without an environmental incident or design failure.

Administrative controls are in place and are functioning as intended. Access to the site is controlled by PPI site security, and a card key system is employed allowing entrance only to approved site personnel, see Photograph 2. Fencing around the PPI site is intact and in good repair. Signs are posted around the perimeter of the site on the fencing and on access gates, see Photograph 7.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and Remedial Action Objectives (RAOs) used at the time of the remedy still valid?

Yes. The ARARs review and the findings of this Five-Year Review reveal that no significant changes in standards or assumptions have occurred to affect the implemented remedy. Exposure pathways that were defined and used to select the remedy remain valid and are comprehensive. Current and anticipated future use of the land and resources surrounding the PPI site has not changed. Physical conditions at the site have not changed in a manner that would affect the protectiveness of the remedy.

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

No. Based on the information in this review, no new information has been discovered that could call into question the protectiveness of the remedy.

Technical Assessment Summary

Based on the data reviewed, the site inspections, and the interviews, the selected remedies and the implementation of the remedies at the PPI site are functioning as intended by the CD and subsequent RPA Reports. There have been no changes in standards or assumptions used to construct the remedy. Conditions at the site have not changed in such a way as to affect the remedy and there is no other information that calls into question the protectiveness of the remedy.

VII. ISSUES

MNA is the currently approved RA for groundwater contamination at the Scenic OU. However, the investigative activities and accompanying analysis reported in Addendum E to the RPA Report (NPC 2003e) revealed two unresolved areas of concern. The first issue arose when a comparison of field data with model predictions yielded several inconsistencies. The second area of concern regards the migration of three COC (TCA, TCE, and PCE) that do not reach equilibrium in the modeled period. Based on current model predictions, additional information is required to adequately describe the fate and transport of the COC in the +20 MSL zone at the Scenic OU. The current lithological database for the +20 MSL zone needs to be improved. Additional groundwater samples will have to be taken to characterize the spatial and temporal relationships in the +20 MSL zone. These issues associated with the MNA remedy at the Scenic OU do not affect the protectiveness of the remedy in the short-term.

To address these two concerns at the Scenic OU, further investigations in the +20 MSL zone are being conducted according to an EPA and LDEQ approved Work Plan. The Work Plan activities include additional borings, a seismic survey, and an update of the groundwater flow and solute transport models; see Section VIII, Recommendations and Follow-up Actions.

Fate of DNAPL in the subsurface of the Brooklawn OU is currently under investigation. Once modeled, the extent of DNAPL movement will be incorporated into an updated groundwater flow and solute transport model. This updated groundwater model will include a transient source configuration. This continuing work at the Brooklawn OU does not currently affect the protectiveness of the selected remedy nor will it affect future protectiveness.

VIII. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

NPC is currently operating under two approved Work Plans, Addendum F for the Brooklawn OU (NPC 2003c) and Addendum G for the Scenic OU (NPC 2003d). These work plans are necessary to adequately complete the modeling of Dense Non-Aqueous Phase Liquid (DNAPL) and groundwater at the PPI site and to address anomalies discovered during remedial investigations. The work plan objectives include an update of the Brooklawn OU and Scenic OU groundwater flow and solute transport models, further investigation of the +20 MSL zone at the Scenic OU and a three-dimensional model of DNAPL movement in the subsurface of the Brooklawn OU. The findings of these investigations conducted in accordance with the work plans and any required modification of the remedy, including the LRMP, will be reported as an addendum to the RPA Report. These work plan activities are anticipated to be reported in the third quarter of 2005.

IX. PROTECTIVENESS STATEMENT

Brooklawn OU

The remedy at the Brooklawn OU is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

Scenic OU

The remedy at the Scenic OU currently protects human health and the environment because the MNA remedy is protective in the short-term. However, in order for the remedy to be protective in the long-term, additional characterization of the +20 MSL zone and an updated groundwater flow and solute transport model is needed to ensure long-term protectiveness.

PPI Site

Construction complete status has been achieved for the PPI site; the following RA has been selected and constructed to be protective of human health and the environment. Source control and protective coverings at the site have reduced the risks associated with ingestion, inhalation, and dermal contact with site contaminants through surface water and sediment pathways for both human and biota receptors. Source reduction continues at the Brooklawn OU during additional DNAPL modeling intended to better characterize the source term for use in updating the groundwater model. Placement of a protective fill in the BBR distributaries has reduced risk, discovered during an EPA commissioned risk assessment, to acceptable levels. The MNA remedy through implementation of the LRMP has been shown to be protective of the down gradient receptors at the probable POE. Sampling of sediments in BBR south of the Scenic OU have demonstrated that the RA of natural recovery is effective. Finally, administrative controls to limit access to the PPI site are in place and continue to be effective in limiting entry to approved site personnel.

X. NEXT REVIEW

The Second Five-Year Review for the Petro-Processors of Louisiana, Inc. Superfund Site will be performed within five years of the signature date of this Five-Year Review report.

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