May 26, 2004

Keith M. Casey, Refinery Manager
Motiva Enterprises LLC - Norco Refinery
P.O. Box 10
Norco, LA 70079

A. W. Pearce, Site Manager
Shell Chemical LP - Norco Site
P.O. Box 10
Norco, LA 70079

Dear Messrs. Casey and Pearce:

The Louisiana Department of Environmental Quality (LDEQ) and the United States Environmental Protection Agency (EPA) Region 6 together have determined that the Motiva Enterprises, LLC/Shell Chemical LP, Norco East Site (the "Property"), is Ready for Reuse. A Ready for Reuse Determination is an acknowledgement that environmental conditions on the property are protective of human health and the environment based on its current and anticipated future use.

The Property is located at 15536 River Road in Norco, St. Charles Parish, Louisiana and is comprised of the Motiva Enterprises LLC – Norco Refinery and the Shell Chemical LP – East Site. The Property has been in continuous operation since its original development in 1916 as an oil terminal. In 1920, the first operating unit was built on the site. Today, the Property encompasses approximately 826 acres of land.

With this Ready for Reuse Determination, LDEQ and EPA Region 6 agree that Motiva Enterprises/Shell Chemical have successfully conducted investigation and risk management activities and the environmental conditions at the Property are protective of human health and the environment based on its current and anticipated future use as a commercial and industrial operation. The Ready for Reuse Basis of Decision is provided at Enclosure 1 to this letter. Copies of relevant documents may be obtained from LDEQ or the facility at the addresses in Enclosure 2 to this letter.

If conditions at the facility change, including environmental conditions, land use, site receptors, and remedy performance, the current owner/operator will notify LDEQ and it may become necessary to perform additional remediation to ensure continuing

protectiveness. The undersigned expressly reserve all rights and authorities to require future action by owners or operators if new or additional information comes to light that impacts this Ready for Reuse Determination, whether such information is known as of this date, or is discovered in the future.

Congratulations on this most noteworthy achievement!

Sincerely yours,

James H. Brent, Ph.D.
Assistant Secretary
Office of Environmental Assessment
Louisiana Department of
Environmental Quality

Stephen A. Gilrein, P.E.
Associate Director
Multimedia Planning and
Permitting Division
EPA Region 6

Enclosure 1: Ready for Reuse Basis of Decision
Enclosure 2: Agency Contacts

ENCLOSURE 1

READY FOR REUSE BASIS OF DECISION
MOTIVA ENTERPRISES, LLC/SHELL CHEMICAL LP, NORCO EAST SITE

1.0 INTRODUCTION

The Louisiana Department of Environmental Quality – Environmental Technology Division (LDEQ – ETD) has determined that Motiva Enterprises, LLC/Shell Chemical LP, Norco East Site ("Norco East Site") is Ready for Reuse. The Norco East Site meets the criteria for a Ready for Reuse determination because the property has been remediated to the extent that the environmental conditions on the site are protective based on its current or planned land use. A description of the current site conditions, background information, and the results of remedial activities at the site are summarized in the following sections.

2.0 SITE DESCRIPTION AND SITE HISTORY

The Norco East Site is located on the east bank of the Mississippi River in southeast Louisiana, in the town of Norco northwest of New Orleans in St. Charles Parish. The East Site has been in continuous operation since its original development in 1916 as an oil refining facility. Shell Oil Company and its subsidiaries, Motiva Enterprises LLC and Shell Chemical LP, have operated the facility since 1929. The East Site contains both oil refining and chemical production units and encompasses approximately 826 acres of land. The East Site is bounded to the east by other industrial facilities, to the west by the town of Norco, to the south by the Mississippi River and to the north by the LaBranche Wetlands. A site location map is provided in Figure 1.

3.0 BACKGROUND

3.1 Previous Investigations

There have been approximately 92 separate environmental investigations conducted at the Norco East Site since January 1985.

Perimeter Groundwater Assessment

In September 1997, as part of the Phase I data evaluation of the Perimeter Groundwater Assessment at the Norco East Site (Figure 1), Norco performed a review of known soil and/or groundwater impacts (PSI, 1997a). The review included data from 69 environmental site assessments and groundwater monitoring data from various on-going monitoring systems, including the Area 12 Perimeter System, the Refinery Wastewater Treatment System, the Old Landfill System, the New Landfill System, and the Refinery Effluent Conveyance System. Additionally, a review of historic aerial photographs and facility maps was performed. The goal of the data review was to evaluate the potential for impacts to the site perimeter. Two areas of concern were identified near the site

perimeter, West Pond Separator and the rail car cleaning area (OL-5 Unit). Following the Phase I data evaluation, in 1998 and 1999, a Phase II subsurface investigation was performed at the Norco East Site perimeter (PSI, 1998; PSI, 1999). Results from the Perimeter Groundwater Assessment indicated that the MO-1 GW3NDW RECAP standard was exceeded for tetrahydrothiophene at well 150. It was also determined that shallow groundwater in the vicinity of well 150 discharges to the refinery wastewater conveyance and treatment system so that any potential migration is captured and subsequently treated in the wastewater treatment system.

Recent Site Investigations

Since completing the investigations associated with the Perimeter Groundwater Assessment, several additional subsurface investigations have been performed at the Norco East Site. Findings associated with each investigation have been submitted to LDEQ for review (see 5.0 REFERENCES). Recent investigations have been performed in the following specific areas:

- West Pond Separator (Rail Yard Area)
- Airline Highway North Property Frontage
- SU2000 Area & South Property Benzene Investigations
- OL-5 Unit Assessment
- Low Sulfur Diesel Release and Assessment and Remediation Program
- Groundwater Certification Assessments

West Pond Separator

The West Pond Separator (WPS) area was historically used to treat stormwater and process wastewaters, with the last separator being closed in 1986. Several site investigations have been performed in this area during 1989-1992 and an annual groundwater monitoring program commenced in 1993. Nine years of results for VOCs and SVOCs show stable groundwater conditions in this area. An additional groundwater investigation was completed in the WPS area in 1996 and in 1999 as part of the Perimeter Groundwater Assessment (PSI, 1999). In 2001, additional soil sampling was performed as part of a source characterization project (ERM, 2001a). In addition, the area is included in the East Site Perimeter Monitoring System.

Airline Highway North Property Frontage

The area between the Norco North Property fence line and Airline Highway was once a continuation of the drainage canal on the north side of Airline Highway east of the Motiva property. The portion of the drainage canal bordering the North Property fence line was filled-in sometime during the 1960's. The preliminary characterization of subsurface soils was completed in May 2001 (ERM, 2001b), following initial discovery of impacted soils in March 2001. The final investigation report was submitted to LDEQ on April 19, 2004. There are low-level exceedances of a few relatively immobile Constituents of Concern (COCs) in soil and no detected exceedances of these same COCs

in groundwater. During the RECAP evaluation, it was determined that corrective action of soil in this area is not feasible. Motiva has recently proposed two well nests downgradient from the Airline Highway North Property Frontage assessment area to monitor groundwater conditions in this area.

The primary risk exposure scenario for human health contact with impacted media is worker contact with impacted soil during maintenance on the numerous pipelines that run through the Area of Interest (AOI). Motiva has instituted institutional control of this exposure pathway through the LA One Call Program, which will notify Motiva of any proposed excavation work in the Airline Highway area so that appropriate worker safety precautions can be taken.

SU2000 Area & South Property Investigations

In 2001, Shell Chemical LP, Norco East Site conducted a subsurface investigation to delineate an existing methyl tert-butyl ether (MTBE) plume associated with an SU2000 gasoline spill at Norco East Site South Property (PSI, 2001). The South Property SU2000 area of interest comprised approximately 2.25 acres, and was bounded by five former monitoring well locations: MW's -55, -56, -114, -115, and –172.

Based on the results of the "Investigation of the SU2000 Area for RCRIS Submittal," dated July 2001, Motiva requested permission to cease operation of the recovery system in a letter dated July 17, 2001. It was proposed that the associated monitoring wells would continue to be sampled on a quarterly basis. LDEQ conditionally approved the request to discontinue the operation of the MTBE recovery system in a letter dated October 2, 2001. The condition provided that quarterly groundwater sampling and reporting would continue until concentrations of MTBE below the RECAP screening standard had been achieved for four consecutive quarters. It was understood that a No Further Action – At This Time (NFA-ATT) for MTBE in groundwater at the SU2000 area would be issued after receipt of the confirmatory analytical results by the LDEQ-ETD.

MTBE recovery operations ceased in the fourth quarter of 2001, and the November 1, 2002 monitoring report concluded the four quarters of sampling requested by LDEQ to support the NFA-ATT request. No groundwater samples had reported detections of MTBE above the RECAP groundwater-screening standard during the four quarters of groundwater data collected and required for closure of the program.

The groundwater analytical results for the monitoring wells verified that residual concentrations of MTBE did not exceed the RECAP groundwater screening standard of 0.52 mg/L MTBE. Therefore, it was determined that a NFA-ATT for MTBE was warranted. On July 24, 2003, the LDEQ requested that the wells specifically installed to monitor the remediation of the former MTBE in groundwater be properly plugged and abandoned (P & A'd) prior to granting the NFA-ATT, and an inspection was made of the former area of investigation and remediation following the well P & A by a representative of the Department. A letter of NFA-ATT for the SU2000 MTBE release is presently being prepared by the LDEQ-ETD.

During the course of the MTBE investigation, a separate area of concern for groundwater impact was identified and an additional subsurface investigation was performed to characterize and delineate the extent of impact (PSI, 2002). Shell Chemical LP, Norco East Site installed a network of monitoring wells in October 2002, and quarterly sampling commenced in January 2003. Additional ongoing activities include monitoring groundwater quality and natural attenuation of the COC (benzene) in the area of impact, and evaluating the potential need for active corrective action. Ongoing groundwater monitoring indicates that the extent of the impact has stabilized and preliminary data indicates that the natural attenuation processes are occurring to remediate the impacted area. Shell Chemical has instituted appropriate institutional controls via the LA One Call Program and site work procedures to ensure that appropriate worker safety precautions are taken when working in the area.

OL-5 Unit Assessment

In 1997, Motiva Enterprises, Norco East Site performed an assessment at the OL-5 Unit following a release of gas oil. During these assessment activities, historic impacts, most likely associated with the former rail car cleaning facility that pre-dated construction of the OL-5 Unit, was identified by the presence of SVOCs (PSI, 1997b). However, all impacts are restricted to the footprint of the operating unit and there is no evidence of migration. Shell Chemical has instituted appropriate institutional controls via site work procedures to ensure that appropriate worker safety precautions are taken when working in the vicinity and the area is included in the East Site Perimeter Monitoring System.

Low Sulfur Diesel Release and Assessment and Remediation Program

On July 25, 2003 the LDEQ-ETD approved the Motiva Enterprises, Norco East Site Soil and groundwater investigation report (dated June 2003) for the low sulfur diesel release, and the remediation plan for the release (dated July 14, 2003). After source removal, the remediation program consisted of the installation of a recovery well at the location of the release for the initial recovery of NAPL and the monitoring of groundwater quality in the area of the release. All work was conducted in accordance with the requirements and procedures described in the "Risk Evaluation/Corrective Action Program" (RECAP), Louisiana Department of Environmental Quality (LDEQ).

Groundwater Certification Assessments

Numerous Groundwater Certification assessments have been performed historically at the Norco East Site. These soil and groundwater investigations are required by the LDEQ for issuance of a Groundwater Certification and are most commonly performed prior to initiation of construction at the facility. As each groundwater certification assessment is performed, a summary report is completed and submitted to LDEQ for approval.

The LDEQ-ETD reviewed and approved the Norco East Site Revised Groundwater Certification Workplan, dated November 7, 2002, with the following understandings:

- Concurrence from LDEQ will be required in determining whether sample collection is necessary.

- If impacts are detected and the source of these COCs is outside of the construction area, then additional sampling in the source area will be required. In addition, if levels detected in the construction area exceed applicable RECAP levels, additional investigation may be required outside the construction area.

- Samples should be collected to the maximum depth of impact.

- Groundwater samples should be collected from all water-bearing zones above the depth of the construction foundation.

- Samples collected should be analyzed for the constituents of concern. Where petroleum hydrocarbons are expected to be encountered, sample parameters should be consistent with RECAP Table D-1.

3.2 Regulatory Background

The following section describes the regulatory background, including the solid waste facility permits, for the Motiva Enterprises, LLC/Shell Chemical LP, Norco East Site.

Solid Waste Activities at the Norco East Site

1. Industrial Landfill (Old Landfill), Solid Waste Permit P-0114 (Now in Post-Closure)

This landfill (permit issued 1986) received non-hazardous industrial waste from both East and West Norco sites until it closed in 1996. Closure certification was submitted in 1997. Current status is 30-year post-closure monitoring.

2. Wastewater Treatment System, Solid Waste Permit P-0268

This system collects, conveys, impounds, treats and releases non-hazardous wastewater from the East Site. This water includes effluent from onsite sewage treatment, stormwater, and non-process wastewater (such as cooling tower and boiler blowdown).

The system includes a stormwater impoundment basin (SWIB) and aeration basin (AB) that provide means to minimize total suspended solids (TSS) and sulfide and to maintain adequate dissolved oxygen levels. After the permit was issued in February 1992, modifications or addendums were submitted to reflect the following changes:

a. Discharge point changed – removed from Bayou Trepagnier and routed to the Mississippi River (1994).
b. Mandatory modifications required by updated solid waste regulations (1994).

c. Withdrew (1991) and then re-incorporated (1995) the system of interconnecting trenches that collect and convey wastewater to the SWIB/AB. A major cleanout in 1991 resulted in dredging of the SWIB and stabilization/disposal of the solids in former catalyst settling ponds (which were clean-closed by removal of waste to offsite). The closed ponds were filled, capped and underwent 3-year post-closure monitoring.
d. Re-permit application (2000) reflecting changes to enhance SWIB maintenance by reconfiguration of inlet section and relocation of aerators. The reconfiguration and cleanout was completed in 2002 and resulted in the reuse rather than disposal of 60,000 cubic yards of solids.
e. Beneficial reuse application submitted (2003) to enable SWIB solids to be strengthened and qualify for onsite reuse applications for dikes, roads, and structural fill.

3. Constructed Wetlands Unit (Non-Permitted Research/Demonstration)

This was a research project performed in 1994 that modified an empty closed catalyst settling basin to conduct studies on metal uptake by wetlands vegetation. The research was to demonstrate the viability of this approach for trace metal reduction in effluent water. Tests were successfully concluded and the wetlands units were closed by removing and disposing of the vegetation and using the containment dike material to fill the basin to grade.

4. Industrial Landfill, Solid Waste Permit P-0310

This landfill commenced operation in December 1996. The landfill was built in compliance with the new solid waste rules that were effective in 1994. The landfill receives non-hazardous industrial waste from Norco East Site, Norco West Site and the St. Rose Site. Current status is active.

4.0 SITE ASSESSMENT AND REMEDIAL ACTIVITIES AND PROGRAMS

Work performed at the Motiva Enterprises, LLC/Shell Chemical LP, Norco East Site has been used to define the nature and extent of all affected media and to determine if additional remedial action is required. The following subsections provide information regarding remedial actions, residual chemicals of concern, summary of site conditions, cleanup standards, and institutional controls that have been placed on the site.

4.1 Groundwater Monitoring Systems

The following monitoring systems are in place at the Norco East Site and are located on Figure 2:

- Closed Solid Waste Landfill (Semi-annual)
- New Solid Waste Landfill (Semi-annual)
- Refinery Wastewater Treatment System (Semi-annual)

- South Property Monitoring System (Quarterly)
- West Pond Separator Monitoring System (Annual)
- East Site Perimeter Monitoring Program (Semi-annual) – currently under construction

Groundwater quality is monitored at each of these locations at the specified frequency, and reported to LDEQ in periodic reports.

4.2 East Site Groundwater Management Program

On April 5, 1995, the concept of a site-wide groundwater management program for the East Site was proposed by Motiva/Shell to the LDEQ. The "Norco East Site Groundwater Management Program" focuses investigative and monitoring efforts on the perimeter of the site, and incorporates a decision-making process using a risk-based framework that is protective of human health and the environment. This approach focuses resources on those areas of the facility (the perimeter) located nearest to potential offsite receptors. It also allows flexibility in addressing areas of concern that may be discovered at the site in the future. This program was developed in cooperation with the LDEQ.

The major elements of the "Norco East Site Groundwater Management Program" include:

- A strong Spill Prevention and Response Plan.
- Groundwater Certification Plan – This plan set forth standardized procedures and requirements for conducting soil and groundwater investigations at the site.
- East Site Perimeter Assessment – An investigation was conducted to establish the potential for soil and groundwater impacts at the site boundaries, which consisted of the collection of soil and groundwater data around the entire site perimeter. Stratigraphic data were collected at 24 locations around the perimeter in order to develop a conceptual hydrostratigraphic model of the site. In addition, groundwater samples were collected from a total 105 sampling points during the investigation.
- East Site Perimeter Monitoring Program – A perimeter groundwater monitoring system is currently being installed around the East Site. When completed, the system will consist of 74 groundwater monitoring wells that are to be sampled on a semi-annual basis.
- Plan for Risk-Based Management of Impacted Soil and Groundwater at the Norco East Site – This plan was developed to define the response actions and procedures used in the event that soil and/or groundwater impacts are discovered at East Site and to manage each such area in a manner consistent with the Risk Evaluation/Corrective Action Program (RECAP).

On July 23, 2003 the LDEQ-ETD conditionally approved the "East Site Perimeter Monitoring Plan for the Motiva Enterprises Norco Refinery and the Shell Chemical

Company - East Site," dated November 2000; and the "Revision Request for the Groundwater Sampling Program, East Site Perimeter Monitoring Plan," dated March 8, 2003.

On February 6, 2003, the LDEQ-ETD conditionally approved the "Plan for Risk-Based Management for Impacted Soil and Groundwater," dated November 7, 2002.

4.3 Other Remedial Actions

Throughout the history of the East Site, numerous interim corrective action activities have been conducted at the facility with oversight by the LDEQ, including the removal of the released contaminants and excavation of soils with confirmatory sampling of soil and groundwater. The most recent release discovery and interim corrective action was that of the low sulfur diesel release, and the remediation plan for the release (dated July 14, 2003). After source removal, the remediation program consisted of the installation of a recovery well at the location of the release for the initial recovery of NAPL and ongoing monitoring of groundwater quality in the area of the release.

4.4 Chemicals of Concern and Summary of Site Conditions

The numerous site investigation and assessment reports demonstrate that, although releases of COCs have occurred as a result of manufacturing activities at the property, residual concentrations do not present an unacceptable risk to human health or the environment, based on risk-based cleanup levels established by LDEQ and given the current and reasonably expected future commercial/industrial use of the facility. The Risk Evaluation Corrective Action Program (RECAP) Standard selected by Motiva/Shell in the RECAP evaluation reports and approved by LDEQ, to ensure protection of human health and the environment, is Management Option 1 (MO-1). MO-1 provides LDEQ-derived RECAP Standards (RS) for soil and groundwater. The MO-1 RS represent constituent concentrations in media that are protective of human health and the environment. The MO-1 RS were derived for industrial land use scenarios using currently recommended default exposure parameters and toxicity criteria issued by the EPA. Current zoning in the area already restricts the facility to industrial use. Shallow groundwater in the area is not used or designated for use as a drinking water source or beneficial resource.

RECAP Regulations are the mechanism for addressing releases at a facility. They were promulgated by LDEQ on December 20,1998 at LAC 33:I. Chapter 13 and were revised on October 20, 2003. RECAP is a tiered framework that consists of a Screening Option (SO) and three risk Management Options (MOs), referred to as MO-1, MO-2 and MO-3. The SO provides LDEQ-derived Screening Standards (SSs) for soil and groundwater. The MO-1 provides LDEQ-derived default RS for soil and groundwater that are protective of human health and the environment. MO-2 and MO-3 are more intense evaluations, which include site-specific data for the evaluation of exposure and environmental fate and transport at the site.

The RS under certain conditions require that a conveyance notice be filed with the respective Parish Clerk of Court. As required, Motiva/Shell will file such notices with the St. Charles Parish Clerk of Court, including a description of the environmental conditions at the facility at the time of the RS selection. Motiva/Shell is responsible for maintaining the RS, and reporting to LDEQ if conditions at the site change, including environmental conditions, land use, site receptors, and remedy performance. If site conditions do change, it will be necessary to revisit this determination of suitability for reuse to ensure its continuing protectiveness.

The current monitored AOIs at the at the Norco East Site are the following, which have been discussed in detail in Section 3.1 above:

- Airline Highway North Property Frontage
- SU2000 Area & South Property Investigations
- Low Sulfur Diesel Release and Assessment and Remediation Program

The locations of the AOIs are shown on Figures 2 through 5. The Airline Highway North Property Frontage Assessment and Monitoring AOI is shown as the area of MO-1 exceedances along Airline Highway and the North Property in these figures. The AOI of the South Property Investigation and Monitoring Program is delineated on Figure 2 and is shown as an insert on Figures 4 and 5. The Low Sulfur Diesel Release and Assessment and Remediation Program AOI is located adjacent to the East Operations Building (EOB) at the center of the East Site South Property shown on Figures 2 through 5, approximately 500 feet south of the fence line with the DOW/Union Carbide Polypropylene Plant.

A comparison of the maximum concentrations of the COCs for these AOIs that exceed the MO-1 RECAP Standards is provided in the attached Table. These COCs at low levels that exceed the MO-1 Standard are considered protective of current use, and are expected to meet the standard in the future.

The following summary identifies conclusions of the exposure pathway analysis for the COCs remaining on site:

Surface Soil

The exposure of workers to chemicals present in surface soil at the site is minimal due to control and monitoring of activities via permits and health and safety policies. Potential exposure routes for surface soil include ingestion, dermal, and inhalation of vapors/airborne particulates. However, most of the site is paved, covered by structures or shell, and unimproved areas of the refinery are vegetated; these features mitigate potential exposure pathways under routine conditions. Facility workers are required to wear protective clothing. Long-sleeved clothing and long pants are required. Fire retardant coveralls must be worn at all times in process units, tank fields, and other areas as specified. The protective clothing minimizes dermal contact with soils. Inhalation of particulates from soil is limited by saturated conditions and surface cover that prevail at the site, which allow only minimal amounts of dust to be generated. Any exposure by

refinery workers to chemicals released to the soil would be considered occupational and therefore regulated by OSHA and site-specific health and safety policies. Personal monitoring is conducted as needed to confirm compliance with OSHA.

Subsurface Soil

The potential for exposure to chemicals in subsurface soil is controlled by the work permit system, the refinery's excavation program, the refinery's compliance with OSHA limits, and other refinery safety programs. These permits require that workers engaged in excavations wear appropriate personal protective equipment (PPE) and use personal monitoring.

As discussed in Section 3.1, the primary risk exposure scenario for human health contact with impacted media at the Airline Highway AOI is worker contact with impacted soil during construction and maintenance activities. Motiva has established institutional control of this exposure pathway through the LA One Call Program, which will notify Motiva of any proposed excavation work in the Airline Highway area.

The chemicals of concern have been identified and screened through previous investigation efforts and monitoring at the site. The results have been evaluated using the LDEQ's Risk Evaluation/Corrective Action Program (RECAP) Management Option 1 (MO-1).

The COCs in soil and groundwater exceeding MO-1 RECAP Standards or site-specific background concentrations are listed in Table 1. Locations of these exceedances are identified on Figures 3, 4, and 5.

To establish a conceptual exposure model for the Norco East Site, available information has been analyzed to identify potential pathways of human and ecological exposure to impacted media. An exposure assessment flowchart is provided in Figure 6 of Attachment 1, and evaluates the potential sources, transport mechanisms, and exposure pathways associated with potentially affected soil, groundwater, sediment, or surface water at the site. For each exposure pathway, relevant on-site and off-site receptors have been identified. Based on available site information, this flowchart provides a site wide conceptual model of complete human exposure pathways at the Norco East Site facility.

Biodegradation and natural attenuation processes are active at the Motiva/Shell East Site, as shown by the results of many years of groundwater monitoring. Due to natural attenuation, available data indicate that off-site migration of constituents and associated exposure in surface water is not expected to occur. Natural attenuation processes at the site are being further evaluated.

4.5 Site Status and Current Conditions

In June of 1999, the LDEQ-ETD notified Motiva Enterprises, LLC/Shell Chemical LP Norco Plant – East Site that the facility was listed as a high priority site for cleanup on

the Resource Conservation and Recovery Act (RCRA) Corrective Action baseline list of facilities. The baseline list was developed by the United States Environmental Protection Agency (EPA), with input from the LDEQ, in response to the U.S. Congress-mandated Government Performance Results Act of 1993 (GPRA), which requires federal agencies to develop measures for tracking environmental results.

The LDEQ evaluated the facility regarding these Environmental Indicators using information for current conditions. In December 2002, based on the evaluation of the available information, the LDEQ determined that the Current Human Exposures and Migration of Contaminated Groundwater were under control at the facility.

5.0 REFERENCES

- ERM, 2001a. Source Characterization Summary – Rail Yard Area Site Assessment. Motiva Enterprises LLC.
- ERM, 2001b. Airline Highway North Property Frontage Assessment. Shell Chemical Company/Motiva Enterprises LLC Norco Manufacturing Complex.
- PSI, 2002. South Property Benzene Investigation. Shell Chemical LP, Norco East Site, Norco, Louisiana.
- PSI, 2001. Investigation of the SU2000 Area for RCRIS Submittal at the Motiva Enterprises Norco Refinery, Norco, Louisiana.
- PSI, 1999. Round 2 of the Phase II Investigation. Perimeter Groundwater Assessment at the Motiva Enterprises Norco Refinery and Shell Chemical Company – East Site, Norco, Louisiana.
- PSI, 1998. Report of Round 1 Sampling Results of the Phase II Investigation. Perimeter Groundwater Assessment at the Shell Norco Manufacturing Facility – East Site, Norco, Louisiana.
- PSI, 1997a. Phase I Evaluation Report. Perimeter Groundwater Assessment, Shell Norco Manufacturing Facility – East Site, Norco, Louisiana.
- PSI, 1997b. Additional Assessment of OL-5 Gas-Oil Release, Shell Chemical Company – East Site, Norco, Louisiana.

Table

Chemicals of Concern that exceed RECAP MO-1 Standards and Comparison with Remaining Maximum Concentrations

Chemical of Concern	CAS No.	Site RECAP Standard	Risk-Based MO-1 Value (mg/L or mg/kg)	Site Maximum COC Concentration (mg/L or mg/kg)
Groundwater:				
Chrysene	218-01-9	GW3NDW*	0.0002	0.0214
2-Methylnaphthalene	91-57-6	GW3NDW	0.178	2.883
Benzene	71-43-2	GW3NDW	0.0125	354
Benzo(a)anthracene	56-55-3	GW3NDW*	0.0002	0.0109
Bis(2-ethylhexyl)phthalate	117-81-7	GW3NDW*	0.01	0.07
Dibenzofuran	132-64-9	GW3NDW	0.0152	0.0459
Fluorene	86-73-7	GW3NDW	0.0776	0.1856
Naphthalene	91-20-3	GW3NDW	0.223	1.691
Phenanthrene	85-01-8	GW3NDW	0.0878	0.2087
Tetrahydrothiophene	110-01-0	GW3NDW	1.81	2.56
TPH		GW3NDW	23.6	6730
TPH-D		GW3NDW	23.6	24.8
Soil:				
Chrysene	218-01-9	SoilGW3NDW	1.81	78.6
2-Methylnaphthalene	91-57-6	SoilGW3NDW	170	417
Anthracene	120-12-7	SoilGW3NDW	121	169
Benzene	71-43-2	SoilGW3NDW	0.128	432
Benzo(a)anthracene	56-55-3	SoilGW3NDW	0.0163	82.1
Benzo(a)pyrene	50-32-8	Soili	0.357	32.5
Benzo (b) fluoranthene	205-99-2	Soili	3.56	37.5
Bis(2-ethylhexyl)phthalate	117-81-7	SoilGW3NDW	0.153	0.459
Dibenz(a,h)anthracene	53-70-3	Soili	0.358	1.87
Dibenzofuran	132-64-9	SoilGW3NDW	14.9	221
Fluoranthene	206-44-0	SoilGW3NDW	186	401
Fluorene	86-73-7	SoilGW3NDW	71.9	290
Ideno(1,2,3-cd)pyrene	193-39-5	Soili	3.58	9.08
Lead	7439-92-1	Site background	413	976
Mercury	7439-97-6	SoilGW3NDW	4	4.2
Naphthalene	91-20-3	SoilGW3NDW	32.3	1590
Phenanthrene	85-01-8	SoilGW3NDW	149	854
TPH		Soili	5010	5356
TPH-D		Soili	5010	5260

Notes:

1. GW3NDW = The RECAP Standard for the Protection of Human Health for Groundwater Classified as Groundwater 3, Which May Discharge to a

Surface Water Body Classified as a Non-Drinking Water Source
2. Soili = The RECAP Standard for the Protection of Human Health for Surface Soil, Industrial Land Use Screening Standard
3. SoilGW3NDW = The RECAP Standard for the Soil Concentration Protective of Groundwater Classified as Groundwater 3, Which May Discharge to a Surface Water Body Classified as a Non-Drinking Water Source

List of Figures

ENCLOSURE 2

AGENCY CONTACTS

For a copy of the administrative record providing detailed information regarding environmental conditions at Motiva Enterprises, LLC/Shell Chemical LP, Norco East Site, please contact:

Louisiana Department of Environmental Quality
Public Records Center
Galvez Building, Room 127
602 N. Fifth St.
Baton Rouge, LA 70802
(225) 219-3168

For questions regarding the environmental conditions described in the Ready for Reuse Basis of Decision for Motiva Enterprises, LLC/Shell Chemical LP, Norco East Site, please contact:

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