RECORD OF DECISION

GULF STATES UTILITIES - NORTH RYAN STREET SITE
GROUND WATER OPERABLE UNIT
LAKE CHARLES, LOUISIANA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6 - SUPERFUND DIVISION

SEPTEMBER 2000

DECLARATION FOR THE RECORD OF DECISION

A. SITE NAME AND LOCATION

Gulf States Utilities-North Ryan Street Site
Lake Charles, Calcasieu Parish, Louisiana
EPA ID No. LAD985169317
Ground Water Operable Unit Number 1 (OU #1)

B. STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for the Gulf States Utilities-North Ryan Street Site (GSU), in Lake Charles, Louisiana, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 USC § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 et seq., as amended. This decision is based on the Administrative Record, which has been developed in accordance with Section 113 (k) of CERCLA, and which is available for review at the Central Calcasieu Parish Library, 301 West Claude Street, Lake Charles, Louisiana and at the United States Environmental Protection Agency (EPA) Region 6 Office in Dallas, Texas. This Selected Remedy was proposed for public comment on June 9, 2000. A formal public meeting was held on July 6, 2000. After responding to comments, EPA selected this remedial action.

The State of Louisiana Department of Environmental Quality (LDEQ) concurs with the Selected Remedy.

C. ASSESSMENT OF THE SITE

The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

D. DESCRIPTION OF THE SELECTED REMEDY

This Operable Unit is one of two at this site. This action, referred to as Operable Unit 1 (OU1), is intended to address all work associated with ground water, including, but not limited to aquifer characterization and classification, interconnection of shallow ground water to surface water and deeper ground water, and contaminant fate and transport. Other actions conducted, or to be conducted, at the site include a removal response action set forth in a June 1999 Action Memorandum which provides for removal and disposal of sediment contaminated with polycyclic aromatic hydrocarbons (PAHs) in the Calcasieu River and treatment of soils and source material contaminated with PAHs, volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs) on-site in the west service yard area. Some soil excavation with off-site disposal is also

planned for the removal action. The removal action is anticipated to be complete by April 2001. A subsequent remedial action, to be named Operable Unit 2 (OU2), is planned to address any residual source (soil/sediment) contamination remaining after both the source removal and ground water remedial actions are completed or underway.

The selected response action addresses principal and low-level threat wastes at the site by ensuring:

- that the site property is maintained for commercial/industrial use only;
- ground water is restored to human health-based standards following remediation of the exposed tar area;
- that no migration of contaminants from the shallow ground water (alluvial aquifer) is occurring which will impact the Calcasieu River surface water causing an exceedence of applicable regulatory or risk-based standards;
- and, that the threat of direct contact with ground water exceeding any risk-based levels is prevented.

The major components of this remedy are:

- Monitored natural attenuation of ground water which includes sampling ground water wells installed to depths within the alluvial aquifer in order to confirm that a decrease in contamination is occurring;

- Monitoring surface water and drinking water supply wells to assure that contaminants do not exceed any regulatory or health based risk levels;

- Institutional controls which require that Entergy Gulf States, Inc. file a notice of ground water use restrictions and place them in the property records for this service center property located at 303 North Ryan Street in Lake Charles, in order to prevent human exposure to contaminated ground water; and

- As long as regulatory standards are being exceeded, long-term operation and maintenance.

E. STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action (unless justified by a waiver), is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Although a dense non-aqueous phase liquid (DNAPL) which is considered source material is present, the remedial investigation revealed that it has low mobility due to its confinement within an isolated, unconnected sand lens surrounded by clay. The findings in the remedial investigation support that source removal (e.g. removal of the DNAPL) is not needed. Although

the DNAPL is a contributor to the ground water contamination in that the dissolved constituents can be found in the ground water, the DNAPL itself is not mobile and is therefore considered a "low level threat" waste. The ground water, in general, has been shown to pose a risk to human health through possible exposure by ingestion or dermal contact. However, it can be reliably contained and presents only a low risk due to relatively low toxicity and low mobility in the environment. Therefore, the EPA concluded that it was impracticable to treat the chemicals of concern in a cost-effective manner. The statutory preference for treatment is not appropriate in this case. The remedial action objectives will be met by employment of passive remediation through natural attenuation, one of the principal elements of the remedy. Because the contaminated ground water at this site poses a relatively low long-term threat, the selected remedy should at a minimum employ engineering controls in order to meet statutory preference.

Because this remedy will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure (and groundwater and/or land use restrictions are necessary), a review will be conducted within five years after initiation of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. Once the cleanup levels have been attained, both the five year review and institutional controls will no longer be required.

F. ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this site.

- Chemicals of concern (COCs) and their respective concentrations;
- Baseline risk represented by the COCs;
- Cleanup levels established for COCs and the basis for the levels;
- Current and future land and ground-water use assumptions used in the baseline risk assessment and ROD;
- Land and groundwater use that will be available at the site as a result of the selected remedy;
- Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected; and
- Decisive factor(s) that led to selecting the remedy.

G. AUTHORIZING SIGNATURES

This ROD documents the selected remedy for ground water at OU #1 at the Gulf States Utilities - North Ryan Street site. This remedy was selected by EPA with concurrence of the Louisiana Department of Environmental Quality.

By: Lynda F Carroll Date: 9-27-00

Gregg A. Cooke
Regional Administrator
Region 6

DECISION SUMMARY

A. SITE NAME, LOCATION AND BRIEF DESCRIPTION

- Gulf States Utilities - North Ryan Street Site, 303 North Ryan Street, Lake Charles, Calcasieu Parish, Louisiana, EPA ID No. LAD985169317

- Lead agency: U.S. Environmental Protection Agency, Region 6, Dallas, TX
  Support agency: Louisiana Department of Environmental Quality, Baton Rouge, LA

- Lead entity: Potentially Responsible Party, Entergy Corporation (formerly Gulf States Utilities)

- Site type: Former Manufactured Gas Plant with landfill area

- Coal tar by-products generated during gas plant activities were disposed of in a six acre wetlands area until 1932. Then the area was used as a landfill for the disposal of electrical equipment and poles, appliances, and other debris. In 1980, the area was at capacity and was filled and covered with shells and soil. Based upon extensive investigation on-site soils have been found to be contaminated mainly with PAHs, benzene and PCBs. The shallow ground water is contaminated with PAHs and benzene.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

1. History of Site Activities

The North Ryan Street site is a former manufactured gas plant. Gas production began around 1916 and the plant was operated until 1924 by the Lake Charles Gas Company. Operations in 1925 and 1926 were by the Lake Charles Electric Company and the Louisiana Electric Company, Inc., respectively. Gulf States Utilities has owned and operated the site since 1927. Gas production was discontinued in 1932, at which point the gas plant was dismantled. In 1993, Gulf States Utilities was acquired by Entergy Corporation. Gulf States Utilities changed its name to Entergy Gulf States, Inc. (GSU), in 1997. GSU currently operates and maintains a service center at the site.

The coal tar by-products generated during gas plant activities were discharged into marshy wetlands west of the gas plant. The size of the wetlands area was approximately six acres. After the gas plant ceased operation in 1932, the wetlands area was used as a landfill for the disposal of electrical equipment, poles, appliances, and other debris. Transformers, capacitors, and drums containing used transformer oil were also reported to have been disposed of in this area. By 1980, the area was at its capacity and was filled and covered with shells/soil and graded until it was level. This area is now used for equipment storage associated with utility company operations.

2. History of Federal and State Investigations and Removal and Remedial Actions

Discovery of conditions, including potential ground water contamination, at the site occurred on July 20, 1988, when utility workers digging a trench along the north side of the property's northern fence line discovered an oily material leaking out of the side of the trench closest to the facility. The Louisiana Department of Environmental Quality (LDEQ) was notified and it, along with the site property owner, Gulf States Utilities, sampled this material. A more thorough investigation of the site revealed a pit where a black substance was found at the surface in the center of the western utility storage yard.

On September 19, 1988, LDEQ ordered Gulf States Utilities to determine the extent of soil, sediment, ground water and surface water contamination and propose a plan for remediation at the site. Gulf States Utilities conducted phased investigative work required under this order beginning in December 1988 and continuing through October 1990. EPA performed a screening site inspection (SSI), in order to determine if Superfund involvement with the site was appropriate. The SSI included sampling activities which began in October 1990. The SSI report was completed in September 1992. Samples collected during SSI field activities from Calcasieu River sediments revealed a release of contaminants including PAHs, VOCs and PCBs from the North Ryan Street site into the adjacent Calcasieu River.

The site was proposed for inclusion on the Superfund National Priorities List (NPL) on February 13, 1995 (60 FR 8212). On July 7, 1997, an Administrative Order on Consent (AOC) was executed between EPA and GSU which provided that GSU would conduct an Engineering Evaluation/Cost Analyses (EE/CA) in support of a non-time critical removal action and a Remedial Investigation/Feasibility Study (RI/FS) to evaluate appropriate Remedial Actions for residual contamination and ground water at the site.

The actions that have occurred to date are displayed in the following table.

Date	Action	Legal Authority	Who Undertook	Results
7/97	RI/FS	AOC	Potentially ResponsibleParty (PRP)	The FS dated October 1999 was the basis for the Proposed Plan for Operable Unit 1 Ground Water which was released to the community for comment in June 2000.
7/97	EE/CA	AOC	PRP	The EE/CA dated October 1998 was the basis for the removal action. It was released to the public for comment in November 1998.
10/99	Removal	AOC	PRP	Started removal action in Jan. 2000 and anticipate completion by April 2001

3. History of CERCLA Enforcement Activities

EPA performed a PRP search to determine the identities of the former owners and operators of the site. Stone & Webster, a Delaware corporation, had provided financial executive management services to several owners and operators of the site (including Lake Charles Electric Company, Inc., Louisiana Electric Company, Inc., and Gulf States Utilities Company (GSU)) for a number of years. On December 31, 1993, Entergy acquired all of the outstanding stock of GSU, a Texas corporation. Therefore, GSU is a wholly-owned subsidiary of Entergy.

The EPA sent a Request for Information under the authority of Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §9604(e), to Stone & Webster, Incorporated, on February 11, 1992. Stone & Webster responded to this information request on April 28, 1992 which outlined available facts that it had gathered to show that there was no basis for naming Stone & Webster a potentially responsible party.

On or about May 25, 1995, EPA issued a Special Notice Letter to Entergy and GSU, informing them of their potential liabilities associated with the site and giving GSU an opportunity to negotiate a settlement providing for the PRPs to conduct or finance response actions at the site. In conjunction with the Special Notice Letter, EPA also sent Entergy a Request for Information under the authority of CERCLA Section 104 (e), 42 U.S.C. §9604 (e).

On or about June 28, 1995, Entergy submitted a response to EPA's information request, and expressed a willingness to fund and/or perform an investigation of the site. An Administrative Order on Consent (AOC) signed by both Entergy and EPA became effective on July 7, 1997. The AOC allowed for Entergy to conduct a concurrent Engineering Evaluation and Cost Analysis (EE/CA), in support of a non-time critical removal action, and a Remedial Investigation/Feasibility Study (RI/FS) project to expedite response actions at the site. Entergy, and its wholly-owned subsidiary GSU, demonstrated to EPA that it has sufficient technical and financial resources to perform and/or finance this work.

C. COMMUNITY PARTICIPATION

Throughout the GSU site's history, community concern and involvement has been high. The PRP and/or EPA have kept the community and other interested parties apprised of site activities through informational meetings, fact sheets, press releases and public meetings. Below is a brief chronology of public outreach efforts.

- In November 1998, the PRP released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in remedial activities.

- On November 8, 1999, EPA opened the Calcasieu Estuary Outreach Office which contains some information relative to the Gulf States Utilities/North Ryan Street site because of its proximity to the Calcasieu River.

- On June 8, 2000, EPA conducted an Open House to present the Proposed Plan including the Preferred Remedy and other alternative remedies that were considered for the Ground Water Operable Unit.

- On June 8, 2000, EPA published a notice and brief analysis of the Proposed Plan for the Ground Water Operable Unit in the *Lake Charles American Press* and made the plan available to the public at Central Calcasieu Public Library.

- On June 9, 2000, EPA made the administrative record available for public review at EPA's offices in Dallas and at the Central Calcasieu Parish Library, 301 West Claude Street in Lake Charles, Louisiana. This will be the primary information repository for local residents and will be kept up to date by EPA.

- From June 9 through July 12, 2000, the Agency held a 30-day public comment period to accept public comment on the alternatives presented in the Feasibility Study and the Proposed Plan and on any other documents previously released to the public.

- On July 6, 2000, the Agency held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting and the comments and the Agency's response to comments are included in the the Responsiveness Summary, which is part of this Record of Decision.

- Local residents from the Calcasieu League for Environmental Action Now (CLEAN) applied for a Technical Assistance Grant (TAG) in July 2000. Once the contract is awarded, CLEAN will retain a consultant to attend technical project meetings and review technical documents related to the site activities.

D. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

This action, referred to as Operable Unit 1 (OU1), is intended to address all work associated with ground water, including, but not limited to aquifer characterization and classification, interconnection of shallow ground water to surface water and deeper ground water, and contaminant fate and transport. Other actions conducted, or to be conducted, at the site include a removal response action set forth in a June 1999 Action Memorandum which provides for removal of contaminated sediment in the Calcasieu River and treatment of contaminated soils and source material on-site in the west service yard area. Some soil excavation with off-site disposal is also planned for the removal action. A subsequent remedial action, to be named Operable Unit 2 (OU2), is planned to address any residual source (soil/sediment) contamination remaining after both the source removal and ground water remedial actions are completed. The response action in this ROD will be consistent with the final action selected for this site.

E. SITE CHARACTERISTICS

The sources of contamination, release mechanisms, exposure pathways to receptors for the contaminated surface and ground water in OU #1, as well as other site-specific factors were reviewed prior to preparation of both the Remedial Investigation and the Baseline Risk Assessment in order to determine which exposure pathways were complete, therefore helping to focus sampling and analysis. The result of this review is considered a conceptual site model, and it showed that the following scenarios for exposure to ground water in the shallow alluvial aquifer and Calcasieu River surface water should be quantitatively evaluated in order to determine the potential risk to human health and the environment.

Ground Water

- Exposure of future on-site workers to ground water from wells installed in the shallow alluvial aquifer through ingestion and dermal contact.

Surface Water

- Exposure of current/future trespassers to sediment and surface water in the drainage ditches along the west and south property boundaries through incidental ingestion and dermal contact.
- Exposure of current/future off-site utility and construction workers to sediment and surface water in the drainage ditches along the west and south property boundaries through incidental ingestion and dermal contact.
- Exposure of current/future recreational users to Calcasieu River sediment and surface water through incidental ingestion and dermal contact.
- Exposure of current/future subsistence fishermen to Calcasieu River surface water through incidental ingestion and dermal contact.
- Indirect exposure of current/future recreational users (off-site residents) to Calcasieu River sediment and surface water through ingestion of contaminated fish and shellfish.
- Indirect exposure of current/future subsistence fishermen (off-site residents) to Calcasieu River sediment and surface water through ingestion of contaminated fish and shellfish.

The site is situated on the south bank of the Calcasieu River, just south of River Road and the North Ryan Street intersection. The site consists of east and west service yards separated by North Ryan Street. (See Figure 1-2, Site Map). The east service yard is three to four acres

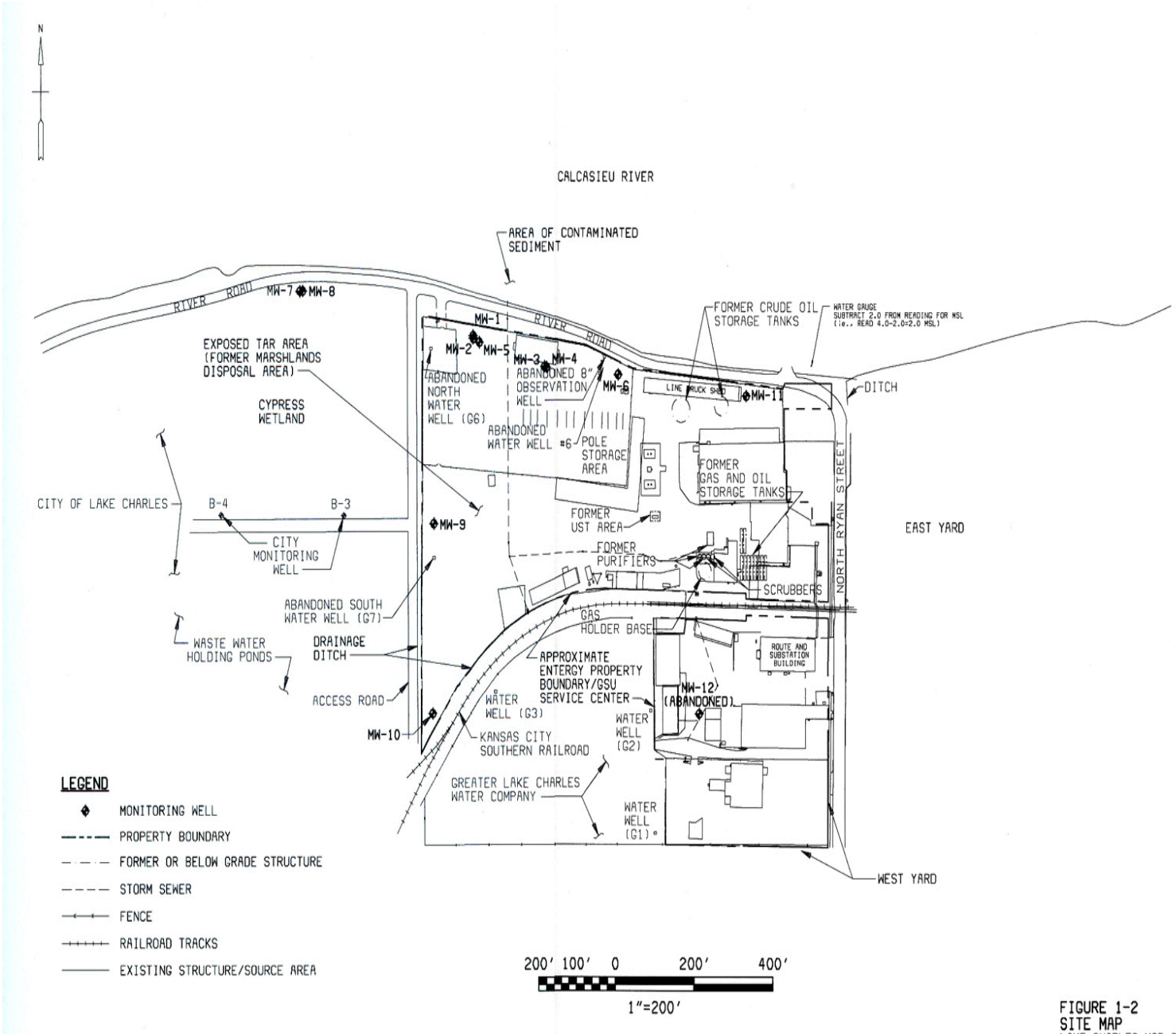


FIGURE 1-2
SITE MAP
LAKE CHARLES MGP SITE
OU1 FS REPORT
40603-650-141-C002

and the west service yard is approximately 16 acres in size. A six acre former wetlands area within the west service yard was included as part of the site due to landfill activities associated with historical site operations.

The Calcasieu River, which is within 60 feet of the site, is the dominant surface water feature in the site area. The river is used for fishing in the area of the site, both for recreational and, to a small extent, commercial purposes. On site, elevations are highest along the southeast boundary and gradually decrease to the northwest towards the Calcasieu River and the cypress wetland. The river receives surface runoff from the site via overland flow, drainage ditches, culverts, and formerly from an underground storm sewer line which is now plugged. The site is within the Calcasieu River flood plain and has historically been subject to flooding, most recently in the 1990s.

Fresh water aquifers underlying the Lake Charles region include undifferentiated shallow alluvial aquifers and the Chicot Aquifer. Ground water below the Chicot Aquifer is predominantly salt water. The shallow alluvial aquifers are located along the Calcasieu River and its tributaries in the area. These aquifers consist of fine sand with thin lenses of coarser sand and varying amounts of silt and clay that were deposited by the river system. These units are capable of locally producing low to high amounts of ground water. The alluvial aquifers are recharged by precipitation and direct hydraulic connection to the Calcasieu River. Discharge from the alluvial aquifers occurs to the Calcasieu River and interconnecting tributaries, and to a smaller extent by leakage into the underlying silts and clays. The alluvial aquifers are generally separated from the Chicot Aquifer by confining silt and clay beds of the Prairie Formation near the site. However, alluvial aquifers are interconnected to the Chicot Aquifer in northern Calcasieu Parish where the Chicot Aquifer outcrops.

The primary freshwater potable aquifer in the Lake Charles region is the Chicot Aquifer. The Chicot Aquifer contains three sand beds separated by clays and silts that are the principal water bearing units in the Lake Charles area. These sand beds are known as the 200-foot, 500-foot, and 700-foot sands which basically correspond with their depths below ground surface. Water discharged or pumped from these sands is used for irrigation, industrial, and municipal drinking water purposes in the Lake Charles area.

Six operating public supply water wells are in close proximity to the site, mostly on the adjacent property at the water treatment plant located directly to the southwest (about fourteen other public supply wells have either been plugged or destroyed). These wells are screened at depth in the regional 500-foot and 700-foot sands. The water pumped from these wells is treated and then distributed for public use. In addition, there are some private residence water wells located in the vicinity of the site to the west/northwest. The closest private well is within ¼ mile of the site. These wells are all completed in either the 200-foot or 500-foot sands of the Chicot Aquifer.

The shallow surface geology underlying the site consists of fill, alluvium, and unconsolidated terrace deposits. Surficial fill covers the majority of the site, with a clay

(cohesive) unit underlying the fill. A sand (granular) unit is present within the clay unit at the northwest portion of the property. The fill varies in thickness from 1 to 12 feet and consists of both sandy and clayey type soil, as well as some shell material. The clay unit consists of silty clay, clayey silt, and sandy clay. In general, it becomes more cohesive with increasing depth. Where the sand unit is present to a maximum thickness of 30 feet near the Calcasieu River (northwest of the site), the clay ranges in thickness from 20 to 36 feet above the sand. The sand pinches out to the south and east near the center of the west service yard. Where the clay unit is present alone (the majority of the site), it extends to over 170 feet below ground surface.

In general, within 100 feet of ground surface, the cohesive and granular units are the two water bearing units underlying the site. A total of 11 ground water monitoring wells are installed on or near the site to monitor this surficial alluvial aquifer (a 12^{th} well was plugged and abandoned since it was drilled through a sewer line). Six wells were installed to monitor the sand (granular) unit; MW-1, MW-2, MW-3, MW-4, MW-8 and MW-9. Four other wells (MW-5, MW-7, MW-10 and MW-11) monitor shallow portions of the clay (cohesive) unit and two which monitor clay (MW-5 and MW-7) are placed in proximity (nested) to wells that are monitoring the sand unit. MW-6 monitors ground water in a discontinuous sand lens within the clay unit. The depth to ground water is relatively shallow, ranging from approximately 2 to 6 feet below ground surface. Based on ground water monitoring data, the general ground water flow direction in the shallow water table aquifer is north/northwest toward the river and appears to be controlled by ground topography. See the figures including ground water flow direction maps and geologic cross sections provided in Appendix A.

Remedial Investigation (RI) work on ground water, surface water, soils, and sediments has been conducted by GSU, under EPA's oversight, since 1997. The RI included extensive sampling and analysis of all media in order to determine the location of the highest levels of contamination. As part of the RI, GSU prepared a Baseline Risk Assessment (BRA) in order to identify potential threats to human health by evaluating cancer and noncancer risks posed to various populations that could possibly be exposed to any of the contaminated soil, sediment, surface water, and ground water on and around the site. In October 1999, GSU developed a Feasibility Study (FS) for the ground water only based upon the findings of the RI and BRA.

Only ground water was evaluated in the FS because most of the threats to human health and the environment posed by soil (also the coal tar source material) and sediment were evaluated during the development of a removal response action. The considerations of the non-time critical removal action are documented in the *Engineering Evaluation/Cost Analysis* (Black & Veatch, 11/98), the Action Memorandum (EPA, 6/99) and the Administrative Order on Consent to Conduct the Removal Action (EPA, 10/99). The removal action began in January 2000 with treatability study sample collection of contaminated soil and source material for use in developing specifications to conduct in-situ thermal treatment, and sediment and surface water sampling for use in developing bid specifications for the dewatering phase of sediment dredging. The removal action involves source removal by in-situ thermal treatment of the highly contaminated soils/source located in the center of the western utility yard, excavation and off-site disposal of soil and pipeline along the storm sewer line that traverses the site from north to south, and

dredging of slightly contaminated sediment along the Calcasieu River bank adjacent to the site. This work is anticipated to be completed by April 2001.

The RI, as it relates to ground water, indicated that:

- In general, the primary contaminants of concern are polynuclear aromatic hydrocarbons (PAHs) and benzene, toluene, ethylbenzene and xylenes (BTEX). A table which provides the range of contaminant levels for PAHs and volatile organic compounds is provided in Appendix B.

- The most prevalent contaminant of concern is benzene. It has been found in wells MW-3 (deep sand), MW-4 (shallow sand), MW-6 (shallow sand lens) and MW-9 (shallow sand) at levels exceeding the Primary Drinking Water Standard Maximum Contaminant Level (MCL) of 0.005 parts per million (ppm). The source of the benzene is thought to be associated mostly with the coal tar contamination which resulted from disposal of coal tar by-products during manufactured gas plant operations. Other potential sources are the former crude oil storage tanks which had been located in the northeastern portion of the site.

- The most contaminated well is MW-6 (shallow isolated sand lens). The contaminants of concern where MCLs have been exceeded include benzene, ethylbenzene, toluene, and benzo(a)pyrene, a PAH constituent. The total PAH concentrations detected in this well are high enough (e.g., concentrations exceeding the solubility limits for the individual compounds) to indicate that there is a pocket of contamination, in this case coal tar (also known as a dense nonaqueous phase liquid (DNAPL)), that is not dissolved in the ground water, but has pooled within a localized sand lens. This pooling was observed during well installation. Numerous boring probes placed around this well indicate that this sand lens is discontinuous and does not extend north toward the river (reference the cross sections provided in Appendix A). The presence of a less permeable silty clay material in this area likely inhibits the migration of PAHs and other chemicals toward the river.

- A number of PAHs have been detected in wells MW-3 (deep sand), MW-4 (shallow sand), MW-5 (shallow clay), MW-6 (shallow sand lens) and MW-9 (shallow sand). The higher molecular weight cancer-causing (carcinogenic) PAHs have only been detected in MW-5 and MW-6. There have been no contaminants detected in MW-5 which exceed any applicable MCLs. MCLs exceedences for MW-6 have been discussed previously. The PAHs detected in MW-3, MW-4 and MW-9 have all been the lower molecular weight or non-carcinogenic compounds. Naphthalene is the individual compound detected at the highest concentrations (1.2 ppm in well MW-9 and 0.31 ppm in well MW-4).

- The plume of contamination including PAHs and BTEXs appears to be localized in the vicinity of the area surrounding the source material (also known as the exposed tar area which was the former marshlands disposal area) located in the center of the west service yard.

- A water level study completed at the site in 1998 showed that there is a connection between ground water in the sand (granular) unit located in the northwestern portion of the site and the Calcasieu River. However, on the basis of surface water and sediment sampling results, the connection has had a minimal effect on contamination in the river. In addition, the results of the baseline risk assessment for the exposure to Calcasieu River sediment and surface water indicate that the connection between ground water in the sand unit and the river has not resulted in site-related contaminants being present in the sediment or surface water at levels that pose an unacceptable risk to human health (based upon the calculated results of the baseline risk assessment).

In addition to the RI that was conducted by GSU, EPA conducted a separate investigation of private water wells used by residents that are in proximity to the site. The purpose of the investigation was to determine if there have been any contaminant impacts to the ground water used as a drinking water source due to the North Ryan Street site. This investigation included collecting and analyzing ground water samples from 21 wells ranging in distances from ¼ mile to 3 miles northwest (downgradient) of the site. The parameters that were analyzed were semivolatile organics, cyanide, metals (inorganics), pesticides, polychlorinated biphenyls, volatile organics, and dioxin. The results were compared to the National Primary and Secondary Drinking Water Regulations (40 CFR 141 and 143, respectively) as set forth by the Safe Drinking Water Act.

The Primary standards are legally enforceable standards that apply to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems. The Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor or color) in drinking water. While EPA recommends water systems meet Secondary standards, compliance is not mandatory.

Generally, the results of this investigation showed the constituent levels were below their associated detection limits. However, there were some wells where the results exceeded the Secondary Drinking Water standards for iron and manganese. These were generally found in those wells that were sampled prior to any filtration system. For the wells that were only able to be sampled after filtration, these parameters never exceeded these standards. The residents were sent the individual results for the well or wells on their property. No constituents that would be attributable to the North Ryan Street site were found in the ground water samples taken from these private wells.

The contaminated ground water in the area of MW-6 is considered to be a “low level threat waste” because concentrations of PAHs are sometimes higher than the solubility limits for the individual compounds indicating the presence of DNAPL. Low-level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Wastes that are generally considered to be low-level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing

chemicals of concern that are relatively immobile in air or ground water, low leachability contaminants or low toxicity source material. Although source material (DNAPL) is present, it has low mobility due to its confinement within a sand lens surrounded by clay. It is, however, a contributor to the ground water contamination as it dissolves. The ground water, in general, has been shown to pose a risk to human health through possible exposure by ingestion or dermal contact. However, it presents only a low risk due to relatively low toxicity and low mobility in the environment.

F. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The site is currently zoned for commercial and industrial use, and city planning documents indicate that these zoning designations are not expected to change. The water table aquifer is not currently being used as a drinking water source on site. Off site wells currently used as drinking water source wells are completed at much greater depths within the Chicot aquifer (e.g. “200 Foot”, “500 Foot” and “700 Foot” Sands). There is a potential that, in the future, ground water supply wells could be installed either on site or off site due to both the high well yield in some of the wells (greater than 150 gallons per minute) and because total dissolved solids (TDS) are less than 10,000 mg/L. The shallow alluvial aquifer could potentially be used in the future, although it is not anticipated any time in the near term. It will probably not occur for at least 25 to 30 years due to the current availability of ground water from the deeper aquifers that provide water of higher quality and average yield.

G. SUMMARY OF SITE RISKS

A baseline risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the site assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The human health risk assessment followed a four step process: 1) hazard identification, which identified those hazardous substances which, given the specifics of the site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances, and 4) risk characterization and uncertainty analysis, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks and a discussion of the uncertainty in the risk estimates. A summary of those aspects of the human health risk assessment which support the need for remedial action is discussed below followed by a summary of the environmental risk assessment.

1. Human Health Risk Assessment

The Baseline Risk Assessment was comprehensive in that it quantitatively evaluated the noncarcinogenic and carcinogenic risks posed to various populations exposed to soil, sediment,

surface water and ground water on and in the site area. This Record of Decision has been developed to address ground water only. The findings of the remedial investigation indicate that there is a connection between the ground water and Calcasieu River surface water, therefore the surface water pathway was evaluated as part of the risk assessment. The results of these evaluations as they relate to ground water and surface water will be presented here in order to show the basis for action on the ground water operable unit.

The first step in conducting a baseline risk assessment is to identify the contaminants of concern ("COCs"). COCs are chemicals present in the ground water at the site that could pose a risk of adverse health effects to exposed human populations obtaining water from on site wells. The COCs were identified from the analyses of ground water samples collected during quarterly sampling events in 1997 (February, June, September, and December) from wells MW-1 through MW-11. A chemical was eliminated from consideration as a COC based on nondetection and nutritional essentiality (i.e. essential metal elements below maximum daily intake). The second step is to perform an exposure assessment the objective of which is to estimate the type and magnitude of exposures to the COCs that are present at or migrating from the site. This includes first calculating exposure point concentrations of each chemical in the ground water where humans are expected to come in contact with it.

The pathways of concern that were considered in the conceptual site model and showed that they should be quantitatively evaluated in order to determine the potential risk to human health and the environment are noted in the Site Characteristics section of this Record of Decision, Section E. These included scenarios of direct exposure to both Calcasieu River surface water and to the ground water, as well as indirect exposure from ingestion of contaminated fish and shellfish.

The following is a description of how the exposure point concentrations for the ground water were arrived at using EPA guidance for conducting a baseline risk assessment including but not limited to the 1995 *Draft Supplemental Region VI Risk Assessment Guidance*. When the total number of samples being considered was greater than five, the 95 percent upper confidence limit (UCL) on the arithmetic mean concentration for a chemical is used as the exposure point concentration. Where this value exceeded the highest observed concentration, the highest observed (maximum) concentration was used as the exposure point concentration. Contaminant concentrations reported as "not detected" were included as one half the sample quantitation limit for the quantification of exposure point concentrations. For the Calcasieu River and drainage ditch surface water samples, the highest observed concentration was used as the exposure point concentration, because the total number of samples for each medium was five or less. The tables presented in Appendix C of this document summarize the exposure point concentrations for the COCs in the surface water and ground water, respectively.

Additional quantification of exposure was required beyond the calculation of exposure point concentrations. This included fish/shellfish concentration modeling and calculation of chemical intakes. Even though no fish or shellfish tissue samples were collected as part of the

Remedial Investigation of this site, an evaluation of the potential exposure of residents and recreational populations to contaminant concentrations in fish and shellfish consumed from the Calcasieu River was conducted. Tissue concentrations of contaminants were modeled by extrapolation of other available data, including the results from sediment and surface water laboratory analyses. Relative to the calculation of chemical intakes there is a basic equation used to calculate human intake of an environmental contaminant. It is "Intake = C (concentration of a chemical in milligrams per kilogram) X Human Intake Factor (kilograms of medium per kilograms of body weight per day)". The Human Intake Factors (HIFs) are site specific terms that quantify the degree of contact between humans and environmental media at the exposure points. Many of the variables applied to the derivation of these HIFs are standards that have been developed by EPA and can be found in various EPA guidance documents including a directive from the Office of Solid Waste and Emergency Response, "Standard Default Exposure Factors," (EPA 1991a), the RAGS manual (EPA 1989a), and the draft Region VI supplemental guidance (EPA 1995a), and the interim final guidance *Dermal Exposure Assessment: Principles and Applications* (EPA 1992c). All of the exposure parameters used in calculating the HIFs, as well as the values for chemical-specific variable are presented in Appendix D of this document.

The third step in conducting a baseline risk assessment is to find chemical-specific toxicity data that is combined with the results of the exposure assessment in order to get to the final step which is characterization of potential risk. The chemical toxicity data used in this assessment was obtained from EPA's Integrated Risk Information System (IRIS) or EPA's Health Effects Assessment Summary Tables (HEAST).

For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$Risk = CDI \times SF$$

where:

risk = a unitless probability (*e.g.*, 2×10^{-5}) of an individual's developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as (mg/kg-day)-1.

These risks are probabilities that usually are expressed in scientific notation (*e.g.*, $1x10^{-6}$). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (*e.g.*, life-time) with a reference dose (RfD) derived for a similar

exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ<1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemical(s) of concern that affect the same target organ (*e.g.*, liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI<1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI > 1 indicates that site-related exposures may present a risk to human health.

The HQ is calculated as follows:

Non-cancer HQ = CDI/RfD

where:

CDI = Chronic daily intake
RfD = reference dose.

CDI and RfD are expressed in the same units and represent the same exposure period (*i.e.*, chronic, subchronic, or short-term).

The table presented in Appendix E shows both RfDs and SFs for all chemicals designated as chemicals of potential concern for the site. A summary of all toxicological data is found in this table, including oral adsorption efficiency percentages, carcinogenicity weight of evidence, and target organs and systems.

Several COCs detected at the site do not have any toxicity data provided by IRIS or HEAST. These analytes are as follows: acenaphthylene, benzo(g,h,i)perylene, phenanthrene, 1-methynaphthalene, 2-methylnaphthalene, endrin ketone, isopropylbenzene, iron, lead, magnesium, and sodium. There are risk assessment issue papers available for 2-methylnaphthalene and iron. The studies, conducted by the EPA's Superfund Technical Support Center, were consulted for alternative sources of toxicity data (EPA 1996b and c). There are no provisional toxicity values available for the other chemicals at this time.

The results of the risk characterization which combines the first three steps of the process concluded that a noncancer or noncarcinogenic Hazard Index (HI) of 28.5 and an excess cancer risk of 2.1×10^{-4} are associated with the exposure of on-site workers to ground water through ingestion and dermal contact while showering. Both of these risks exceed acceptable levels. The noncarcinogenic risk is due primarily to the dermal contact pathway (HI of 22.1), whereas the cancer risk is primarily associated with the ingestion pathway (1.4×10^{-4}). The major contributors to the overall ground water risk are arsenic, benzene, beryllium, fluoranthene, manganese, naphthalene, and toluene.

Both of the Calcasieu River surface water exposure pathways exhibited risks that exceed

a noncarcinogenic HI of 1.0 (both pathways exhibit an HI of 14,700). The risks are due to the dermal exposure pathway to thallium. This risk was calculated based upon an actual maximum thallium concentration level of 2.4 parts per billion (ppb) found in the surface water. There is currently no ambient water quality standard set for thallium in the Louisiana state regulations. The presence of thallium in the river water does not appear to be site-related because it was not detected in the soil and ground water samples collected on-site at elevated or unacceptable levels. If thallium is not considered in the assessment, the risks are considerably less than 1.0 (both pathways exhibit an HI of 0.005). No cancer risk was found with the surface water. Continued surface water monitoring will be required for this site and all of the data will be forwarded to the state.

The risks are summarized in the following tables:

SUMMARY OF CARCINOGENIC RISKS

Exposure Population	Exposure Scenario	Risk
Current/Future Offsite Utility Worker	Ingestion of Surface Water	$2.0x10^{-7}$
	Dermal Contact with Surface Water	$1.8x10^{-9}$
	Sum of Risk: Surface Water Exposure	**$2.0x10^{-7}$**
Current/Future Offsite Construction Worker	Ingestion of Surface Water	$2.0x10^{-7}$
	Dermal Contact with Surface Water	$1.8x10^{-9}$
	Sum of Risk: Surface Water Exposure	**$2.0x10^{-7}$**
Current/Future Adult/Child Trespasser	Ingestion of Surface Water	$2.4x10^{-6}$
	Dermal Contact with Surface Water	$4.4x10^{-8}$
	Sum of Risk: Surface Water Exposure	**$2.4x10^{-6}$**
Cypress Wetlands		
Current/Future Offsite Utility Worker	Ingestion of Surface Water	$2.0x10^{-8}$
	Dermal Contact with Surface Water	$1.8x10^{-9}$
	Sum of Risk: Surface Water Exposure	**$2.0x10^{-7}$**
Current/Future Offsite Construction Worker	Ingestion of Surface Water	$2.0x10^{-7}$
	Dermal Contact with Surface Water	$1.8x10^{-9}$
	Sum of Risk: Surface Water Exposure	**$3.8x10^{-8}$**
Current/Future Adult/Child Trespasser	Ingestion of Surface Water	$2.4x10^{-6}$
	Dermal Contact with Surface Water	$4.4x10^{-8}$
	Sum of Risk: Surface Water Exposure	**$2.4x10^{-6}$**
Calcasieu River		
Current/Future Adult/Child Recreational User	Ingestion of Surface Water	$1.0x10^{-11}$
	Dermal Contact with Surface Water	$6.4x10^{-8}$
	Sum of Risk: Surface Water Exposure	**$6.4x10^{-8}$**
Current/Future Subsistence Fisherman	Ingestion of Fish and Shellfish	$2.9x10^{-8}$
	Sum of Risk: Fish and Shellfish Exposure	**$2.9x10^{-8}$**
	Ingestion of Surface Water	$1.0x10^{-6}$
	Dermal Contact with Surface Water	$6.4x10^{-8}$

Exposure Population	Exposure Scenario	Risk
	Sum of Risk: Surface Water Exposure	**$1.1x10^{-6}$**
Current/Future Recreational Fisherman	Ingestion of Fish and Shellfish	$5.4x10^{-8}$
	Sum of Risk: Fish and Shellfish Exposure	**$5.4x10^{-8}$**
Ground Water		
Future Onsite Worker	Ingestion of Ground Water	$1.4x10^{-4}$
	Dermal Contact with Ground Water while Showering	$6.6x10^{-5}$
	Sum of Risk: Ground Water Exposure	**$2.1x10^{-4}$**

SUMMARY OF NONCARCINOGENIC RISKS

Exposure Population	Exposure Scenario	Hazard Index
Drainage Ditches		
Current/Future Offsite Utility Worker	Ingestion of Surface Water	0.03
	Dermal Contact with Surface Water	0.41
	Sum of Hazard Index: Surface Water Exposure	**0.44**
Current/Future Offsite Construction Worker	Ingestion of Surface Water	0.71
	Dermal Contact with Surface Water	10.5
	Sum of Hazard Index: Surface Water Exposure	**11.2**
Current/Future Adult/Child Trespasser	Ingestion of Surface Water	0.29
	Dermal Contact with Surface Water	4.37
	Sum of Hazard Index: Surface Water Exposure	**4.66**
Cypress Wetlands		
Current/Future Offsite Utility Worker	Ingestion of Surface Water	0.03
	Dermal Contact with Surface Water	0.02
	Sum of Hazard Index: Surface Water Exposure	**0.05**
Current/Future Offsite Construction Worker	Ingestion of Surface Water	0.71
	Dermal Contact with Surface Water	0.59
	Sum of Hazard Index: Surface Water Exposure	**1.3**
Current/Future Adult/Child Trespasser	Ingestion of Surface Water	0.29
	Dermal Contact with Surface Water	0.25
	Sum of Hazard Index: Surface Water Exposure	**0.54**
Calcasieu River		
Current/Future Adult/Child Recreational User	Ingestion of Surface Water	0.0000001
	Dermal Contact with Surface Water	14700
	Sum of Hazard Index: Surface Water Exposure	**14700**
Current/Future Subsistence Fisherman	Ingestion of Fish and Shellfish	0.00001
	Sum of Hazard Index: Fish and Shellfish Exposure	**0.00001**
	Ingestion of Surface Water	0.01
	Dermal Contact with Surface Water	14700
	Sum of Hazard Index: Surface Water Exposure	**14700**
Current/Future Recreational Fisherman	Ingestion of Fish and Shellfish	0.000005
	Sum of Hazard Index: Fish and Shellfish Exposure	**0.00001**

Exposure Population	Exposure Scenario Ground Water	Hazard Index
Future Onsite Worker	Ingestion of Ground Water	6.35
	Dermal Contact with Ground Water While	22.1
	Sum of Hazard Index: Ground Water Exposure	**28.5**

The table found in Appendix F summarizes the uncertainties associated with the baseline risk assessment process that was applied to this site.

2. Ecological Risk Assessment

A screening ecological risk assessment indicated that there are ecological risks related to this site. These ecological risks are due to metals and PAHs present at elevated concentrations in sediment within an area located along the south bank of the Calcasieu River. These sediments are being addressed through the removal response action which requires dredging, dewatering and off-site disposal of the contaminated material. The removal response action was designed to reduce the ecological risk to biological communities on or near the site. There were no ecological risks found that were directly associated with the ground water.

3. Basis for Response Action

The baseline human health risk assessment revealed that future on-site workers exposed to compounds of concern in ground water via ingestion and dermal contact may potentially present an unacceptable human health risk. Therefore if the response action selected in this ROD is not implemented, an imminent and substantial endangerment to public health, welfare, or the environment will occur.

H. REMEDIATION OBJECTIVES

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives (RAOs) were developed to aid in the development and screening of alternatives. These RAOs were developed to mitigate, restore and/or prevent existing and future potential threats to human health and the environment. The RAOs for the selected remedy for the Ground Water Operable Unit are:

- Maintain site property for commercial/industrial use only;
- Prevent exposure to site contaminated ground water, above acceptable risk levels for potential receptors;
- Restore the site ground water to human health-based standards following remediation of the exposed tar area; and
- Assure that no migration of contaminants from the ground water is occurring whereby the impact causes the surface water to exceed regulatory and/or risk-based standards relating

to human health and the environment.

The removal objective of reducing the amount of heavily contaminated source material to minimize the continued threat of chemical migration from this material into the shallow ground water is listed as a specific objective of the removal action for the exposed tar area which is considered source material as well as a contributor to the existing pocket of DNAPL found in the vicinity of MW-6. Integration of the source control aspect of the removal action with the ground water remedial action is critical to achieving the remedial action objective of aquifer restoration.

The Remedial Goal for each contaminant in the ground water is established to accomplish the objective for restoration of the ground water to human health-based standards. The results of the baseline risk assessment indicate that the hazardous substances present in the ground water beneath the site may present a potential threat to public health or welfare. This principal area of concern is the organic contamination (PAHs and VOCs) present in the ground water within the sand lense of monitoring well MW-6. In addition, there are some inorganic contaminants (metals) that contribute to the overall risk. The remedial goals established for the ground water are identified in the following table and are protective of human health for the consumption of drinking water obtained from the alluvial aquifer beneath the site. The remedial goals for barium, benzene, benzo(a) pyrene, beryllium, ethylbenzene, toluene and total xylenes are based on their respective maximum contaminant level (MCL) specified under the Federal Safe Drinking Water Act ("SDWA"). For the remaining contaminants including acenaphthene, anthracene, fluoranthene, fluorene, naphthalene, and pyrene, health-based risk level concentrations are used since no MCLs have been established. These health-based levels, preliminary remediation goals (PRGs) were calculated utilizing the appropriate EPA guidance and this information is available in the Operable Unit 1 Feasibility Study dated October 1999.

Ground Water Remedial Goals

Chemical of Concern	Target Level (ppm)	Chemical of Concern	Target Level (ppm)	Chemical of Concern	Target Level (ppm)
Acenaphthene	0.16 (PRG)	Beryllium	0.004 (MCL)	Pyrene	0.33 (PRG)
Anthracene	0.03 (PRG)	Ethylbenzene	0.70 (MCL)	Toluene	1.00 (MCL)
Barium	2.00 (MCL)	Fluoranthene	120 (PRG)	Total Xylenes	10.00 (MCL)
Benzene	0.005 (MCL)	Fluorene	0.24 (PRG)		
Benzo(a)pyrene	0.0002 (MCL)	Naphthalene	13.8 (PRG)		

ppm - parts per million
PRG - Preliminary Remediation Goal, a calculated remediation goal using health-based criteria
MCL - Maximum Contaminant Level, a regulatory standard set by EPA for protection of drinking water

I. DESCRIPTION OF ALTERNATIVES

Remedial alternatives for the North Ryan Street site are presented below. The alternatives are numbered to correspond with the numbers in the Feasibility Study report (Black & Veatch, October 1999). The term monitored natural attenuation (MNA) was not used in the Feasibility Study. However, EPA has purposefully chosen this terminology in the presentation of this Record of Decision in order to stress that EPA does not consider MNA to be a "default" remedy - it is merely one option that should be evaluated along with other applicable remedies. EPA does not view MNA to be a "no action" approach, but rather considers it to be an alternative means of achieving remediation objectives in a reasonable time frame that may be appropriate for specific, well-documented site circumstances where its use meets the applicable statutory and regulatory requirements.

SUMMARY OF GROUND WATER REMEDIAL ALTERNATIVES - NORTH RYAN STREET SITE	
FS Designation	Description
Alternative 1	No action
Alternative 2	Ground water use restrictions, monitored natural attenuation of ground water, surface water and public water supply monitoring.
Alternative 3	Ground water use restrictions, permanent barrier wall, extraction well installation, on-site treatment using granulated activated carbon and discharge of treated water to a Publicly Owned Treatment Works (POTW), ground water and surface water monitoring.
Alternative 4	Extraction well installation, on-site treatment using granulated activated carbon and discharge of treated water to a POTW, ground water and surface water monitoring.
Alternative 5	Extraction well installation, discharge of water to a POTW for treatment, ground water and surface water monitoring.
Alternative 6	Ground water use restrictions, permeable treatment or barrier wall, ground water and surface water monitoring

Common Elements

Many of these alternatives include common components. Several of the remedy alternatives (Alternatives 2, 3, and 6) require institutional controls (e.g., recording notice in the property deed) to limit the use of ground water in connection with the property to ensure the water is not used either for drinking water (ingestion) or bathing (dermal contact) purposes. These measures for prevention of ground water use are discussed in each alternative as appropriate. The type of notice mechanism is specified in the selected remedy section (Section K) of this Record of Decision (ROD). However, none of the potential alternative remedies rely exclusively on institutional controls to achieve protectiveness. Monitoring to evaluate the effectiveness of the remedy is a component of each alternative except the "no-action" alternative.

Alternatives 3, 4, and 5 require extraction of ground water prior to treatment. Two of these extraction alternatives include treatment in a granulated activated carbon (GAC) unit prior to discharge to a Publicly Owned Treatment Works (POTW) (Alternatives 3 and 4), and one includes

direct discharge to the POTW for treatment (Alternative 5). There is one in-situ treatment alternative, the permeable treatment wall (Alternative 6), a passive remediation. All of the ground water alternatives, except the "no action" alternative, are expected to attain the Remedial Action Objectives.

Alternatives

Alternative 1 - No Action

Estimated Capital Cost: $0
Estimated Annual Operations and Maintenance (O&M) Cost: $29,000
Estimated Present Worth Cost: $23,000
Estimated Construction Timeframe: None

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison (40 CFR 300.430 (e)(3)(ii)). Under this alternative, EPA would take no action at the site to prevent exposure to the ground water contamination. As specified in the NCP, at 40 CFR 300.430 (f)(4)(ii), a five-year review of the site would be conducted to determine if remedial actions need to be implemented. The present worth cost relates to the conduct of a five-year review. Five-year review costs would consist of a two-day site visit for two people and the labor and expenses associated with producing a five-year review report. The life of the alternative is assumed to be five years.

Alternative 2 - Monitored Natural Attenuation and Institutional Controls

Estimated Capital Cost: $23,400 *Estimated Construction Timeframe: 3 months*
Estimated Annual O&M Cost: $73,500 *Estimated Timeframe to Achieve RAOs: 3 to 10 yrs*
Estimated Present Worth Cost: $553,571

First, Alternative 2 would consist of Entergy Gulf States, Inc., the current property owner and potentially responsible party, recording a deed notice of site conditions specifically relating to the ground water present underneath the GSU service center property which does not currently allow for unlimited use and unrestricted exposure. This notice would serve to inform any property owner of inappropriate use (e.g. installation of water wells into the alluvial aquifer to use for human consumption) of the contaminated ground water. Furthermore, the notice would be recorded and included in any deed conveying any interest in the GSU property in order to inform any potential future property owner of the restrictions on use of the ground water beneath the property.

Second, under this alternative, ground water monitoring for PAHs, Volatile Organic Compounds (VOCs) and metals would be performed quarterly for the next three years. The site-specific characterization data from the quarterly events will be analyzed annually to demonstrate the efficacy of the natural attenuation, as evidenced by decreasing trends in contaminant levels, at which point the results of the analysis will be used to determine whether the monitoring program

should proceed as is, or whether analytical parameters, sampling locations or sampling frequency should be revised. Specifically, the appropriate monitored natural attenuation requirements for analysis would be applied to this data (as in any of the alternatives that include monitored natural attenuation). The most prevalent processes that are anticipated to occur in achieving the remedial action objectives (i.e. reduction of contaminant levels) include dilution and adsorption. In addition, most of the contaminants of concern are known to readily degrade in an aerobic environment. Based upon the remedial investigation, the DNAPL is localized in and around monitoring well MW-6. It is a contributor to the ground water contamination, but it is not mobile itself, therefore removal is not required.

Third, surface water sampling of Calcasieu River water and sampling of the six operating public supply water wells, which are located at a water treatment plant directly southwest of the site, would be performed annually during the first three years in order to evaluate changes in contaminant levels in order to compare this data to the monitoring well results and to determine if additional action might be necessary. Appropriate monitored natural attenuation modeling concepts would be applied. Naturally the trends would need to show that the concentration values for the target contaminants were less than the levels found prior to initiation of the removal action and that modeling shows that it is possible to restore the ground water within a reasonable time frame.

This alternative assumes that natural attenuation processes would occur over time to provide additional protection of surface water and ground water. Natural attenuation of ground water involves allowing naturally-occurring fate and transport processes to reduce contaminant concentrations to acceptable levels. Although there would be no active remediation of the ground water under this alternative, residual ground water risk would be lower than current risk because use restrictions would prevent exposure to ground water. If decreasing trends are evident after the third year, monitoring will continue annually, for a period not to exceed ten years. If decreasing trends are not evident at the end of the third year, then quarterly monitoring will continue until the five year review is conducted, at which time an assessment of the monitoring program will be conducted and appropriate action will be taken. A contingency plan will be considered for initiation, but in order to allow for flexibility based upon changing technology and regulatory trends, no specific contingency is stated in this ROD. This remedy has been selected more on predictive analysis, rather than evidence. It is known, however, that the BTEX contaminants will biodegrade based upon experience and success at underground storage tank sites. It is also known that metals will dilute and/or adsorb into the aquifer material. Some of the PAHs respond like the BTEX parameters and do readily biodegrade under certain conditions.

The capital costs include all costs related to placing the ground water use restrictions on the property. By implementation of a long term ground water monitoring program following completion of the removal action at the exposed tar area, assumptions for operations and maintenance have been made in estimating the costs. For the purposes of this ROD and the cost estimate, the assumed sampling schedule is outlined in the following sentences. The on-site monitoring wells will be sampled quarterly for the first three years, annually for years 4 through 10, then annually each five years after that. The public water supply wells and surface water will be

sampled annually in years 1 through 10, then annually each five years after that. This requirement may be discontinued, when the remedial action goals for the ground water have been met.

Alternative 3 - Ground Water Containment Through Installation of a Vertical Barrier

Estimated Capital Cost: $2.8 million *Estimated Construction Timeframe: 1 yr*
Estimated Annual O&M Cost: $72,000 *Estimated Timeframe to Achieve RAOs: 2 to 5 yrs*
Estimated Present Worth Cost: $3.9 million

Alternative 3 involves recording deed notice in the property records for the site, ground water and surface water monitoring, and installation of a permanent vertical barrier wall (approximately 1,000 linear feet to a depth of 55 feet) at the site to prevent the migration of contaminated ground water into the Calcasieu River. The barrier would be installed along the north and northwest property boundaries to prevent the migration of contaminants between the shallow ground water unit and the Calcasieu River.

In conjunction with the barrier wall, extraction wells would be installed within the shallow ground water plume to create a positive head within the contained area. This is required both to prevent the escape of contaminated ground water through joints in the sheet piling wall and to protect the integrity of the barrier wall. EPA estimates that five extraction wells each pumping at a rate of 1 gallon per minute (gpm) would be required to control the ground water flow gradient, based upon known site hydrogeologic conditions. The exact number of extraction wells, well locations, pumping rates and duration, and zones of influence would be determined during remedial design. New and existing monitoring wells would be used both to verify the hydraulic performance of the extraction wells and to determine the extent of the cones of depression around the extraction wells.

Ground water extracted from each well would be treated on-site. The treatment facility would consist of solids separation, filtration, and granulated, activated carbon (GAC) adsorption. The design of the treatment facility would be completed following a treatability study to evaluate the performance of GAC adsorption in remediating contaminated ground water at the site. The treatability study would determine the approximate frequency and quantity of chemical additions for solids separation and metals removal (if required), would evaluate the approximate amount of operating time before depletion of the activated carbon, and would verify that discharge limits can be met. For costing purposes, this alternative assumed that the treated water would be discharged to the POTW. However, the treated water could also be discharged to the Calcasieu River if a National Pollutant Elimination Discharge System (NPDES) permit was obtained. The actual discharge point for the treated water would be determined during remedial design.

It is assumed that the RAOs would be achieved within 2 to 5 years after which O&M would not necessarily be required. The cost assumptions however, assumed that O&M would continue for 30 years.

Alternative 4 - Ground Water Extraction and On-site Treatment for Active Restoration

Estimated Capital Cost: $676,000 *Estimated Construction Timeframe: 1 yr*
Estimated Annual O&M Cost: $150,000 *Estimated Timeframe to Achieve RAOs: 2 to 5 yrs*
Estimated Present Worth Cost: $3 million

Alternative 4 involves installation of extraction wells to actively restore the ground water in the shallow alluvial aquifer to meet remediation goals. No notice of ground water use restrictions would be recorded in the land records for the GSU property because ground water would be restored to pre-contaminated conditions. It is estimated that five extraction wells, each pumping at a rate of 10 gpm, would be required to control the ground water flow gradient and capture the contaminated plume. Ground water extracted from each well would be treated on-site. As is the case in Alternative 3, the treatment facility would consist of solids separation, filtration, and GAC adsorption. The design of the treatment facility would be completed following a treatability study to evaluate the performance of GAC adsorption in remediating contaminated ground water at the site. The treatability study would determine the approximate frequency and quantity of chemical additions for solids separation and metals removal (if required) would evaluate the approximate amount of operating time before depletion of the activated carbon, and would verify that discharge limits can be met. For costing purposes, this alternative assumed that the treated water would be discharged to the POTW. However, the treated water could also be discharged to the Calcasieu River if an NPDES permit was obtained. The actual discharge point for the treated water would be determined during remedial design.

Alternative 5 - Ground Water Extraction and Off-site Treatment for Active Restoration

Estimated Capital Cost: $311,000 *Estimated Construction Timeframe: 6 months*
Estimated Annual O&M Cost: $136,000 *Estimated Timeframe to Achieve RAOs: 2 to 5 yrs*
Estimated Present Worth Cost: $2.4 million

Alternative 5 includes installation of extraction wells to actively restore the ground water in the shallow alluvial aquifer to meet remediation goals. No notice of ground water use restrictions would be recorded in the land records for the GSU property because ground water would be restored to pre-contaminated conditions. It is estimated that five extraction wells, each pumping at a rate of 10 gpm, would be required to control the ground water flow gradient and capture the contaminated plume. Ground water extracted from each well would not be treated on-site but would be discharged to the off-site POTW for treatment. The POTW uses activated sludge for wastewater treatment and ultraviolet light for disinfection.

Extracted ground water would be pumped into a holding tank before it was discharged to the POTW for treatment. Combining the various streams of ground water from the extraction wells would result in the discharged water to be more uniform in the type of chemical constituents and concentrations than each ground water stream separately. A more consistent waste stream would allow the POTW to operate more effectively. If the ground water streams were discharged directly to the POTW, it could result in slugs of higher concentration ground water being

discharged that may upset wastewater treatment plant operations. It would also be more cost effective to collect ground water samples from a holding tank than from each stream separately. The holding tank would also facilitate treatment if pre-treatment was required before the ground water was discharged to the POTW. The need for pre-treatment would be assessed as part of the treatability study during remedial design.

Operation and maintenance of the system would require one person part time. The responsibilities of this person would be significantly less than required by Alternatives 3 and 4 because treatment of the water would be occurring off-site. Only periodic monitoring (three to four times per week) of the extraction system would likely be necessary, therefore a part-time operator would probably be sufficient.

Alternative 6 - In-Situ Ground Water Treatment Using A Permeable Treatment Wall

Estimated Capital Cost: $3 million *Estimated Construction Timeframe: 1 yr*
Estimated Annual O&M Cost: $25,000 *Estimated Timeframe to Achieve RAOs: 2 to 5 yrs*
Estimated Present Worth Cost: $3.4 million

Alternative 6 involves recording notice of restrictions on ground water use in the property records for the site, ground water and surface water monitoring, and installation of a permeable treatment wall across the northwesterly flow path of the contaminated ground water plume to prevent the migration of contaminants between the shallow alluvial aquifer and the Calcasieu River. This system would be installed as a “funnel and gate” whereby the 500 feet of impermeable barrier along the both the west and north property boundaries would direct the flow through the gate that would consist of a mix of granulated activated carbon and silica sand forming the treatment wall. The maximum depth of this wall would be approximately 54 feet below ground surface. Extraction wells to control gradient flow would not be installed as part of this alternative.

A permeable barrier would allow contaminated ground water to move passively through the wall while prohibiting the movement of contaminants. Permeable barrier walls are placed in trenches that are similar to trenches for grout curtains. However, the barrier medium is porous rather than solid, and is designed to treat or destroy the ground water contaminants.

To monitor the effectiveness of the permeable barrier in capturing and treating the ground water contaminant plume, surface water samples would be collected from the Calcasieu River, and new and existing monitoring wells would be sampled annually and analyzed for PAHs and VOCs. The results of this monitoring would be presented in an annual report.

It is assumed that the RAOs would be achieved within 2 to 5 years after which O&M would not necessarily be required. The cost assumptions however, assumed that O&M would continue for 30 years.

J. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section l2l(b)(1) of CERCLA presents several factors that at a minimum EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives as follows.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria.

Overall Protection of Human Health and the Environment

All of the alternatives except the "no action" alternative would provide adequate protection of human health and the environment by reducing risk through treatment, engineering controls and institutional controls. All of the remaining ground water alternatives would either protect human health by preventing the potential future exposure of human populations to ground water contaminants or by restoring the alluvial aquifer to drinking water standards, thereby meeting the Remedial Action Objectives.

All of the alternatives, with the exception of Alternative 2 ("Ground water use restrictions, MNA, monitoring surface water and public water supply"), contain engineering controls to prevent the future migration of ground water contaminants from the shallow alluvial aquifer into the Calcasieu River and thereby protect the environment. However, the results of the baseline risk

assessment show that exposure to surface water and sediment does not exhibit an unacceptable human health risk for site-related chemicals (thallium, which has not been detected at elevated levels on-site, drives the risk in the surface water). In addition, Alternative 2 requires quarterly monitoring of surface water and local public water supply wells. Therefore, the implementation of Alternative 2 will sufficiently protect human health and the environment. Continued monitoring of the surface water will help to keep track of the thallium levels and these findings will be provided to the state.

Compliance with ARARs

All of the ground water alternatives when fully implemented, with the exception of Alternative 1 ("No Action"), would meet their respective Applicable or Relevant and Appropriate Requirements (ARARs) for Federal, State and local laws. The remedial action will be conducted in such a manner so as to eliminate the actual or potential release of hazardous substances, pollutants, or contaminants to the environment and shall attain applicable or relevant and appropriate standards under Federal environmental law including, but not limited to some of requirements in the Safe Drinking Water Act (SDWA), 40 U.S.C. Section 300 et seq., Clean Water Act (CWA), 33 U.S.C. Section 1251 et seq., the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et seq., Wetlands Executive Order (Number 11990), or any promulgated standard, applicable or relevant and appropriate requirements, criteria or limitations under a State environmental or facility siting law that is more stringent than any Federal standard, requirement, criteria, or limitation contained in a program approved, authorized or delegated by the Administrator and identified to the President by the State. The specific ARARs can be found in Table 1 of Appendix G.

The analysis of ARARs identified the following as applicable State regulations: 1) Louisiana Natural Resource Regulations, Title 43, which provide rules and regulations for protecting Louisiana's natural resources; 2) Louisiana Water Quality Regulations, Title 33, Part IX, Chapters 1-21, which control discharge of wastes into State water bodies by establishing effluent limitations and water quality standards and also set designated uses for State water bodies; 3) the Louisiana Civil Code, Article 2520 § 2039, which requires a landowner who has actual or constructive knowledge that his or her property has been used for disposal of hazardous waste or as a solid waste landfill to record notice of the identification of the location of the waste site in the mortgage and conveyance records of the parish in which the property is located.

In addition, other items have been identified as requirements to be considered (TBCs). The City of Lake Charles, Louisiana, Wastewater Treatment Operations requirements should be considered because the City may require a pretreatment agreement for treatment and discharge of ground water to the POTW. More information regarding the ARARs and TBCs for remediation of OU1 at this site can be found in Table 1 of Appendix G. In addition, Table 2 of Appendix G provides Federal and State standards, requirements, criteria, or limitations that were identified as potential ARARs in connection with the remediation of this site.

Long-term Effectiveness and Permanence

A long-term risk would continue to be associated with Alternative 1 as long as the contaminant concentrations in the ground water exceeded the cleanup goals. However, because no monitoring would be performed, there would be no mechanism to evaluate either effectiveness or permanence. Alternatives 3, 4, 5, and 6 would exhibit both long-term effectiveness and permanence because of the containment and treatment technologies that would be implemented in these alternatives. No residual contamination would be associated with treated ground water (Alternatives 3, 4, 5, and 6) or treatment residuals generated from the on-site treatment system (Alternatives 3 and 4). Alternative 2 would exhibit less long term effectiveness and permanence than other alternatives because ground water is not being actively treated or otherwise contained. The effectiveness would be maintained as long as the appropriate institutional controls remained that would prohibit use of contaminated ground water beneath the site, thereby protecting human health over the long term. Nonetheless, natural attenuation under Alternative 2 has some uncertainty associated with the time required to reach cleanup levels.

Ground and surface water monitoring would be used to determine if the barrier walls (Alternative 3 and 6) or ground water treatment (Alternatives 4, 5, and 6) were preventing the migration of ground water contaminants and/or providing the restoration of the ground water in the shallow granular unit.

Placement of notice on the property deed would be implemented as a part of Alternatives 2, 3, and 6. If properly implemented, ground water use restrictions would be a reliable means of preventing exposure to contaminated ground water. In addition, each of these alternatives requires surface water monitoring and, in the case of Alternative 2, also requires monitoring of the public water supply wells in proximity to the site, thereby supplying a mechanism to track the effectiveness of the remedy both short term and long term.

Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Alternative 1 does not involve any active treatment or containment of contaminated ground water, therefore there would be no reduction in the toxicity, mobility, or volume of ground water contaminants. Alternative 2 involves passive remediation that would allow for natural fate and transport processes to reduce toxicity of the contaminants. The monitored natural attenuation selected remedy under Alternative 2 takes into consideration that the DNAPL plume is not moving (it is confined to a perched sand lense in the vicinity of MW-6). The DNAPL is a contributor to the dissolved contamination in the ground water causing it to be a “low-level threat” waste which does not necessarily require treatment per the NCP. For ground water extracted and treated under Alternatives 3, 4, and 5, there would be significant reduction in the toxicity, mobility, and volume of the ground water contaminants. In addition, the barrier wall of Alternative 3 would significantly decrease the mobility of the ground water contaminants remaining in the granular unit. Under Alternative 6, the toxicity, mobility, and volume of all contaminants in ground water that passes through the permeable barrier and is treated would also be significantly reduced. Ground water contaminants remaining in the alluvial aquifer under all alternatives would undergo no reduction in

their toxicity or volume, except through natural fate and transport processes. All of the ground water treatment processes would be essentially irreversible. Treatment residuals would only be generated during on-site ground water treatment (Alternatives 3 and 4).

Short-term Effectiveness

No short-term risks to the public, site workers, and the environment would occur during the implementation of Alternatives 1 and 2 because no invasive remedial actions would be implemented. The risks associated with the remaining alternatives could be minimized through the implementation of proper controls during the construction and operation of the remedial actions.

The time to achieve the RAOs would vary between the ground water alternatives. Alternative 1 may never achieve the RAOs. For Alternatives 2, 3, and 6, the objective of preventing human exposure to contaminated ground water in the area of the site would be achieved immediately upon filing the deed notice in the appropriate records. If contaminants migrate, Alternative 2 may not prevent exposure since it does not involve containment. However, it is assumed that natural attenuation of the contaminants in ground water will allow for all of the RAOs to be achieved within a reasonable time frame of between three and five years for Alternative 2. The remedial objective of minimizing the migration of contaminated ground water to the Calcasieu River would be achieved in approximately 12 months for Alternatives 3 and 6, which is the amount of time it is estimated to construct sheet piling and permeable barrier walls at the site, respectively. It is assumed that the RAOs for Alternatives 4 and 5 would be achieved sometime within 2 to 5 years of constructing the ground water extraction and treatment system. However, the effectiveness of the pump and treat technology employed by Alternatives 4 and 5 is questionable since a significant volume of water would be removed from the Calcasieu River along with pumping the alluvial aquifer to contain the ground water contaminants. This could have a detrimental impact on the environmental condition of the cypress wetlands west of the site. Therefore, from this comparison, alternatives requiring notice of ground water use restrictions (Alternatives 2,3, and 6) provide the greatest short-term effectiveness.

Implementability

Providing notice of ground water use restrictions in Alternatives 2, 3, and 6 would be easy to implement because GSU owns the site property. Construction of the sheet piling wall of Alternative 3 and the permeable barrier wall of Alternative 6, would be labor intensive, but implementable. Placement of the media within the permeable barrier wall may be more difficult. Because of the wide use of the pump and treat technology, the construction and operation of the ground water extraction and treatment system under Alternatives 3, 4, and 5 would be readily implementable. Overall, Alternative 2 would be the simplest alternative to implement because it only involves implementing ground and surface water monitoring.

If required, implementation of additional remedial actions for soil or sediment would be compatible with all of the ground water alternatives outlined in this Proposed Plan. The effectiveness of Alternatives 3, 4, 5, and 6 would be determined through ongoing ground water

and surface water monitoring. The effectiveness of notice of ground water use restrictions (Alternatives 2, 3, and 6) would be easy to monitor because GSU owns the site property. Both Alternatives 3 and 4 would require the disposal of treatment residuals. Because of the small quantity of residuals anticipated to be generated under each alternative, the availability and capacity of off-site disposal facilities should not pose any problems. All of the alternatives except Alternative 1 would result in generation of ground water from the sampling activities. This water will require storage until the analytical results reveal waste characterization information to determine appropriate disposal.

Cost

There are low costs associated with Alternative 1, the no action alternative. The total present worth of Alternative 1 is $23,000. The overall highest capital, O&M, and present worth costs are associated with Alternative 3 ($3,891,000), which involves the installation of a permanent barrier wall to prevent the migration of tar and ground water into the Calcasieu River. The next two most costly alternatives are Alternatives 4 ($2,987,000) and 6 ($3,397,000), which involve pumping ground water in the shallow granular unit and treating it with GAC, and by passively treating ground water with a treatment wall, respectively. The cost of the remaining pump and treat alternative, Alternative 5, is lower at $2,407,000. With the exception of Alternative 1, Alternative 2 ($553,500) is the lowest cost alternative.

State/Support Agency Acceptance

The State of Louisiana supports the Preferred Alternative - Number 2 without comment.

Community Acceptance

During the public comment period, the community has basically accepted the Preferred Alternative. Response to the comments have been included as part of this Record of Decision in the Responsiveness Summary.

K. THE SELECTED REMEDY - ALTERNATIVE 2

Based upon consideration of the requirements of CERCLA, and the detailed analysis of the alternatives using the nine criteria, EPA has determined that the Monitored Natural Attenuation and Institutional Controls, Alternative 2, is the selected remedy for the ground water operable unit. Monitored natural attenuation has been selected based on the fact that the type of contaminants found at this site (e.g. PAHs, VOCs) have been known to biodegrade at other sites. In addition, a contingency plan has been incorporated as part of this remedy to assure its success in meeting the remedial action objectives. Based on information currently available with respect to the evaluation criteria and the other alternatives, EPA believes the selected remedy provides the best approach to achieve the remedial objectives and goals. The elements of the selected remedy include:

C Implementation of a long-term ground water monitoring program following completion of the exposed tar area remediation. Quarterly sampling and analyses of ground water monitoring wells will be used to evaluate the effectiveness of the source remediation in reducing contaminant migration to the ground water and the effectiveness of natural attenuation in reducing contaminant concentrations to achieve the remedial goals.

C Recording deed notice to inform the public of site conditions. Specifically, EPA will request LDEQ, in accordance with La. Rev. Stat. Ann. § 30:2039 (2000) and La. Admin. Code tit. 33 § 3525 (1999), to require the owner(s) of the facility property to record a notice in the mortgage and conveyance records of Calcasieu Parish. The notice must provide at least the following information:

- That the property has been the subject of a CERCLA response;
- That hazardous substances remain in the ground water present underneath the GSU service center property above levels that allow for unrestricted exposure;
- That use of this ground water may pose a threat to human health or the environment, and may subject the property owner to liability under CERCLA or other laws;
- That structures including fences, gates, monitoring wells with locking caps, and any other feature necessary for protectiveness of the remedy or for its successful completion and/or operation and maintenance, remain on the property at specified locations;
- That the property may be subject to restrictions under LAC 33: V.Chapter 35.

A full copy of the notice must also be filed with the Calcasieu Parish zoning authority and any other authority having jurisdiction over local land use. This notice would serve to inform any property owner of inappropriate use of the contaminated ground water. This task would be the responsibility of Entergy Gulf States, Inc., the current property owner and potentially responsible party at the site.

The selected remedy is cost effective and will meet the remedial action objectives. No risks were identified to existing off-site residents or off-site recreational users. Since there are no known populations currently obtaining drinking water from the shallow alluvial aquifer, the most likely potential receptors were determined to be future on-site workers who will utilize on-site wells to obtain water for drinking or other uses (e.g., irrigation). Potential risks from site contaminants were only identified under the hypothetical future worker scenario. Although the shallow alluvial aquifer could potentially be used in the future, it is not anticipated any time in the near term. It will probably not occur for at least 25 to 30 years due to the current availability of ground water from the deeper aquifers that provide water of higher quality and average yield.

The selected remedy for the ground water operable unit is protective of human health and the environment and complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action.

Remedial Goals

The Remedial Goals to be obtained at the conclusion of the remedial action for the ground water operable unit are identified in Remediation Objectives section of this Record of Decision. The natural attenuation process will have achieved the remedial action objectives when the sampling program indicates with reasonable confidence that the concentrations of contaminants are less than the remedial goals outside of the waste management area (exposed tar area).

Contingency Planning

Within five years of initiation of Alternative 2, the groundwater analytical results will be evaluated to determine and document the effectiveness of natural attenuation. To ensure that the remedy remains protective of human health and environment, the conditions which were established or which existed as the basis for implementation of Alternative 2 will verify that improvement has occurred during the review of the natural attenuation effectiveness. If any conditions change during the five year period the situation will be reevaluated and appropriate action will be taken. If upon application of all appropriate monitored natural attenuation requirements and modeling, it appears that the remedial action objectives may not be obtained within a reasonable remaining time frame then a contingency plan should be considered.

A specific contingency will not be named here. Those that should be considered include establishing Alternate Concentration Limits (ACLs) for the ground water, filing for a technical impracticability waiver or consideration of one of the other alternatives in this ROD.

Cost Summary

The detailed cost estimate for the selected ground water remedy is presented in Appendix H. Specific areas subject to change are the number of monitoring wells and the frequency of sampling conducted at the site. Following the source area remediation, the initial three years of monitoring are expected to be conducted quarterly to develop a statistical data base to monitor the progress of the natural attenuation process. Sample analyses will be for both organic and inorganic contaminants. The organic analyses will be used to verify the effectiveness of the in-situ thermal desorption process. The inorganic analyses will verify the effectiveness of the overall removal action. The frequency of monitoring following this initial period is expected to decrease and may be continuously adjusted during the long-term monitoring period. However, the rate of the natural attenuation process in reducing contaminant concentrations at the site may alter the expected sampling frequency resulting in a change in the cost estimate for the remedy. For the purposes of the cost estimate, the frequency of monitoring is expected to decrease to annually for years 4-10 followed by annually during years 15, 20, 25, and 30.

Expected Outcome of Selected Remedy

The ground water remedy will be implemented following completion of the in-situ thermal desorption of the exposed tar area and excavation of soil/sediment at the site. Performance of the

selected remedy in achieving the remedial action objectives and goals will be evaluated under the monitoring program.

The operation and maintenance activities for the selected remedy are expected to include collection of ground water samples, measurement of the ground water levels, and inspection of the monitoring well to verify the integrity of the well. In addition, water samples will also be collected on an annual basis from the Calcasieu River and the six nearby public water supply wells. Five-year reviews conducted for this operable unit will be performed according to existing guidance ["Structure and Components of Five-Year Reviews" (OSWER Directive 9355.7-02), "Supplemental Five-Year Review Guidance" (OSWER Directive 9355.7-02A), and Second Supplemental Five-Year Review Guidance" (OSWER Directive 9355.7-03A)], the "Comprehensive Five-Year Review Guidance" (OSWER Directive 9355.7-03B-P) and any updated guidance].

The selected ground water remedy is expected to return the alluvial aquifer to its beneficial use as a potential source of drinking water after the remedial goals have been achieved. If the contingency planning indicates that ACLs are appropriate for the site, then institutional controls, in the form of notice of ground water use restrictions recorded in the property records, may remain in effect indefinitely. Implementation of ACLs for this aquifer may result in a ban on the installation of any water supply well at the site, or some other restriction that will ensure protection of human health.

L. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the GSU site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, will comply with ARARs and is cost effective. In addition, the selected remedy utilizes permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable, and satisfies the statutory preference for treatment that permanently and significantly reduces the toxicity of hazardous substances as a principal element.

The Selected Remedy is Protective of Human Health and the Environment

This ground water remedy protects human health and the environment through implementation of institutional controls to prevent accidental human exposure through the installation of drinking water wells. The current cancer risk to human health through the ground water exposure pathway is 2.1×10^{-4} for a future on-site worker. For non-carcinogenic threats, the hazard index is 28.5 for a future on-site worker. There are no adverse impacts identified to either the Calcasieu River or any private or City of Lake Charles drinking water well. Implementation of institutional controls, by Entergy Gulf States, Inc., will provide notification to current and future landowners of the existing contamination at the site. By implementing the in-situ thermal desorption removal action in the exposed tar area, the principal source of contaminants leaching into the ground water will be eliminated. Natural attenuation processes are

then expected to steadily decrease the existing contaminant concentrations below the remedial goals set for this site. While the effectiveness of the natural attenuation processes have not been documented at this site, BTEX compounds have been successfully biodegraded at other sites, particularly Underground Storage Tanks (USTs). Other physical processes such as dilution and adsorption may reduce the other contaminant concentrations to the Remedial Goals. The monitoring program will evaluate the changes in ground water contaminant concentrations following source area response action, the effectiveness of the natural attenuation process, and the effectiveness of institutional controls in preventing future exposure scenarios. In addition, monitoring of both the public water supply and the Calcasieu River surface water will ensure that no migration of contaminants from the site is occurring at levels which would pose a risk to human health and/or the environment.

The Selected Remedy Complies With ARARs

The selected ground water remedy when fully implemented will meet the Applicable or Relevant and Appropriate Requirements (ARARs) for Federal, State and local laws. The remedial action will be conducted in such a manner so as to eliminate the actual or potential release of hazardous substances, pollutants, or contaminants to the environment and shall attain applicable or relevant and appropriate standards under Federal environmental law including, but not limited to the Safe Drinking Water Act (SDWA), 40 U.S.C. Section 300 et seq., or any promulgated standard, applicable or relevant and appropriate requirements, criteria or limitations under a State environmental or facility siting law that is more stringent than any Federal standard, requirement, criteria, or limitation contained in a program approved, authorized or delegated by the Administrator and identified to the President by the State.

The analysis of ARARs identified the following as applicable State regulations: 1) Louisiana Natural Resource Regulations, Title 43, which provide rules and regulations for protecting Louisiana's natural resources; and 2) the Louisiana Civil Code, Article 2520 § 2039, which requires a landowner who has actual or constructive knowledge that his or her property has been used for disposal of hazardous waste or as a solid waste landfill to record notice of the identification of the location of the waste site in the mortgage and conveyance records of the parish in which the property is located.

In addition, other items have been identified as requirements to be considered (TBCs). The EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.02 may be used as guidance in establishing the Maximum Contaminant Levels for ground water contaminants. More information regarding the ARARs and TBCs for remediation of the ground water operable unit at this site can be found in the Tables in Appendix G.

The Selected Remedy is Cost-Effective

In the Lead Agency's judgment, the selected remedy is cost-effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR 300.430(f)(1)(ii)(D)). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied

the threshold criteria (i.e., that are protective of human health and the environment and comply with all federal and any more stringent ARARs, or as appropriate, waived ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria -- long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative then was compared to the alternative's costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

EPA believes the ground water remedy will eliminate the risks to human health at an estimated present worth cost of $553,571. The cost of the selected ground water remedy is significantly less than the present worth costs for the other alternatives that were considered; $3.9 million for Alternative 3, installation of a permanent barrier wall with extraction wells and treatment of extracted ground water; $3 million for Alternative 4, extraction well installation, on-site treatment using granulated activated carbon and discharge of treated water to a Publicly Owned Treatment Works (POTW); $2.4 million for Alternative 5, extraction well installation with discharge of water to a POTW for treatment; and $3.4 million for Alternative 6, installation of a permeable treatment or barrier wall. The selected ground water remedy is considered more cost effective because the same degree of protectiveness to human health and the environment is achieved at a much lower cost.

The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

The selected ground water remedy meets the statutory requirement to utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Natural attenuation rather than active treatment processes is the most practicable and cost efficient treatment method available. While natural attenuation is not a treatment technology, it is an alternative means of achieving the remedial objectives and goals within a reasonable time frame compared to the other alternatives. EPA has determined that the selected ground water remedy provides the best balance in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, or volume achieved through treatment, short-term effectiveness, implementability, and cost, while also considering the statutory preference for treatment as a principal element and considering state and community acceptance.

The Selected Remedy Permanently and Significantly Reduces the Toxicity, Mobility or Volume of the Hazardous Substances as a Principal Element

Since the ground water contamination only represents a low level threat at this site, treatment to reduce the toxicity, mobility, or volume of contamination in the ground water is not necessarily required. In addition, the use of natural attenuation instead of active treatment for the ground water is more cost effective because the same degree of protectiveness to human health and the environment is achieved at a much lower cost. Therefore, more aggressive treatment of the ground water is not necessarily appropriate at this site to achieve the remedial action objectives

or goals.

Five-Year Reviews of the Selected Remedy are Required.

Because this remedy will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within five years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

M. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Gulf States Utilities/North Ryan Street site was released for public comment on June 9, 2000. The Proposed Plan identified monitored natural attenuation (MNA) of the ground water with institutional controls, in the form of notice of ground water use restrictions recorded in the property records as the preferred alternative for remediation of the site ground water contamination. EPA reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the proposed plan, were necessary. Although no significant changes were required, some alterations were made that differ from the proposed plan. The reason for these changes resulted from the comments received and are documented in the Responsiveness Summary. The main items that were changed included the Remedial Action Objectives, some of the sampling and analysis requirements, and the insertion of a contingency plan to the selected remedy. Despite these changes the ROD is still consistent with the originally stated objectives in the Proposed Plan and remains protective of human health and the environment. In addition, the present worth costs have changed from $388,000 to $553,500.

N. STATE ROLE

The Louisiana Department of Environmental Quality has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Risk Assessment and Feasibility Study to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental and facility siting laws and regulations. The State of Louisiana had concurred with the selected remedy for the Gulf States Utilities/North Ryan Street site in the Proposed Plan and since there are no significant changes, the state concurs with the selected remedy in this Record of Decision. A copy of the declaration of concurrence is attached as Appendix I.

RESPONSIVENESS SUMMARY

This Responsiveness Summary is prepared from written and oral comments received during the public comment period on the Proposed Plan. The comment period began June 9, 2000 and closed on July 12, 2000. A formal Public Meeting was held on July 6, 2000, at the Carnegie Memorial Library located at 411 Pujo Street in Lake Charles, Louisiana. Three people attended the meeting and a transcript of the oral comments received at the meeting was prepared. EPA received one (1) written comment letter concerning the requirements of the Preferred Remedy as stated in the Proposed Plan. In addition, there were two post card submittals. The comments were generally supportive of the proposed remedy for the ground water. Written comments and the public meeting transcript are part of the Administrative Record. The Administrative Record Index is included as Appendix J to the ROD.

Summary of Major Comments Received

1. Comment: A citizen of Calcasieu Parish was concerned about the potential for migration of the contaminated ground water from the site in a southerly direction.

   Response: Based upon the findings of the Remedial Investigation: 1) the ground water flow direction within the contaminated alluvial aquifer is to the northwest, 2) there is no current evidence of off-site contamination in ground water from activities that have occurred at this site.

2. Comment: One citizen fully accepted the selected remedy from the Proposed Plan as the most effective in reaching the regulatory objectives.

   Response: The EPA concurs.

3. Comment: A resident in the vicinity of the site believes that this site has not caused any environmental damage and should be left alone. He stated that it was an expensive inconvenience to the nearby residents and that the contamination will be stirred up and spread by initiating the selected remedy.

   Response: The selected remedy is expected to cause limited, if any, inconvenience to the residents since natural attenuation is basically a passive remediation utilizing natural means. The requirement is that there will be monitoring events scheduled whereby samples of ground water will be collected and analyzed on a regular basis to show that decreasing contaminant levels are occurring. In addition, the surface water and public water supply will also be collected and analyzed to assure no migration of existing contamination in the ground water has impacted either the surface or potable ground water. These events should really have no impact on the nearby residents. Relative to the expense, EPA expects to enter into negotiations with the Potentially Responsible Party to have it conduct the work at its expense. This seems likely since the PRP has entered into such agreements with EPA in the past for this site.

4. Comment: The representative of one of the local environmental action groups stated that the selected remedy was acceptable as documented in the Proposed Plan if the following additions would be considered for inclusion: 1) excavation and/or ground water recovery in the area of MW-6; 2) a requirement that if the concentrations of contaminants in ground water do not decrease (with time) that an active remedial approach be initiated prior to the five year review; and 3) a program to evaluate on an annual basis the likelihood that the ground water concentrations will meet RAO's.

   Response: The last two comments have been addressed in the selected remedy explanation and are inherent in the monitoring program for this remedy. Sampling and analysis of the contaminated ground water will be required on a quarterly basis for the first three years, with an annual report that documents the interpretation by application of the appropriate monitored natural attenuation requirements to that data. The annual reports will provide indications of whether the monitoring program requires any adjustment or modification. As long as the sampling of the surface water and public water supply ground water shows that there has been no migration of the contaminants and the institutional controls are in place, this remedy remains protective of human health and the environment while the natural attenuation processes are at work. Regarding the request to consider conducting excavation or ground water recovery in the area around MW-6, the DNAPL is relatively immobile, is limited in area and volume, and is not expected to source the remaining ground water contamination. There is no indication that site-related contaminants have or will migrate off-site either into the Calcasieu River surface water or into the underlying public water supply aquifers (Chicot Formation). By requiring institutional controls whereby a notice of ground water use restrictions will be placed into the property records, this ground water will not be allowed to be used for human consumption.

5. Comment: It is logically inconsistent to mandate both institutional controls and attaining risk-based standards given that the former is based on eliminating exposure and the other assumes exposure. The risk-based cleanup standards are redundant, since the remedial actions already taken, coupled with institutional controls, will result in the protection of both human health and the environment. There can be no reasonable expectation that MNA will result in attaining MCLs or other risk-based levels within the 10 year time frame, as explained in the OU1 Feasibility Study.

   Response: Relative to these issues, the EPA has slightly modified the requirements stated in the Proposed Plan and incorporated them into this Record of Decision. The principal changes include modification of the remedial action objectives and the insertion of a contingency plan. The contingency plan offers some flexibility, should it appear that by the time of the five-year review the stated risk-based cleanup standards may be unattainable. The EPA believes that it may indeed be difficult to achieve the risk-based cleanup standards in MW-6, however the EPA does believe that it is possible to reach these standards in the other monitoring wells. The institutional controls are indeed in place for the purpose of limiting exposure while the natural attenuation processes are at

work and are, therefore, neither inconsistent nor redundant. In addition, the EPA deems it necessary to set numerical standards vs. performance based standards. Although no off-site impacts appear to have occurred, this cleanup is based on the potential threat to human health and the environment (e.g., future on-site worker exposure). MCLs offer a definitive remediation goal to be achieved for this cleanup.

6. Comment: There is no reasonable technical basis for suspecting that contamination in the shallow ground water will ever affect the ground water in the Chicot drinking water aquifer located over 350 feet deep and separated from the shallow aquifer by the confining silt and clay beds of the Prairie Formation.

   Response: EPA agrees. However, it is possible that some conduits exist to allow for passage of these contaminants from the upper aquifer to the lower aquifer(s) due to the proximity of existing and former public water supply wells. There is no record for plugging and abandoning some of the former public water supply wells and without knowing if these wells were plugged and abandoned appropriately, they could serve as possible conduits allowing the contamination in the upper aquifer to travel into the lower aquifer(s). The EPA treats this as a possible threat to human health and the environment.

7. Comment: The preferred alternative identified in the Feasibility Study provided for a site monitoring program designed to ensure that the site is not presenting any off-site risks. Currently, contaminants are not migrating into the Calcasieu or the Chicot aquifer, but if conditions change, the remedial approach proposed in the Feasibility Study will need to be revisited.

   Response: The selected remedy incorporates the site monitoring program and will attempt to utilize the data to evaluate the MNA processes in achieving the Remedial Goals. By making the modifications to the Proposed Plan and documenting them in this Record of Decision, the selected remedy provides a framework to achieve long-term permanence and is consistent with any future action that should occur at this site (e.g. residual contamination in soils and sediment).

8. Comment: The Proposed Plan fails to distinguish between ground water in the granular (sand) unit and the ground water in the shallow clay. The useability is never discussed. The Feasibility Study only addressed the ground water in the granular unit.

   Response: The EPA has determined that because of the variability of this alluvial aquifer in regards to its overall geology and hydrogeology, there is not a positive distinction between the “cohesive (clay)” and “granular (sand)” units. The hydraulic conductivity measurements of wells MW-7 through MW-12 through slug testing conducted in February 1997 seems to support this variability (e.g. it appears that sometimes the clay unit allows for greater ground water flow than the sand unit).

9. Comment: The Proposed Plan has acknowledged that the only risk resulting from contact with the Calcasieu River surface water is associated with thallium, which the EPA has acknowledged is not the result of contamination from the site. Therefore, "reducing or eliminating the threat of direct contact with surface water exceeding regulatory standards" is not an appropriate RAO for [the site]. A more appropriate RAO might be assuring that no migration of contaminants is observed from the granular unit on site to the surface water in the river. There has been no measurable impact observed to date.

   Response: The EPA has indeed changed the remedial action objective to state the following: "Assure that no migration of contaminants from the ground water is occurring whereby the impact causes the surface water to exceed regulatory and/or risk-based standards relating to human health and the environment."

10. Comment: Thallium and vinyl chloride are not contaminants of concern with respect to this site. Although EPA required thallium to be included in the baseline risk assessment because it contributes to the overall risk, it should not be subject to risk-based Preliminary Remediation Goals (PRGs) or regulatory standards as part of the RAOs for the site. Vinyl chloride has never been detected at the site, and acetone and arsenic have never been detected above the identified target levels in ground water or surface water samples at the site. Barium has only been detected above the target level in one monitoring well, MW-7. Since no site-related contaminants have ever been detected in ground water samples from this well, it is unlikely that the elevated barium is related to the site. Therefore, acetone, arsenic, barium, thallium, and vinyl chloride should be eliminated from the chemicals of concern.

    Response: The EPA has agreed to remove acetone, arsenic, thallium and vinyl chloride as chemicals of concern. Barium will not be removed until it consistently does not exceed its associated MCL. In addition, beryllium has been added, since it was not only found to contribute to the overall risk in ground water, but it also has, during some sampling events in some monitoring wells, exceeded its associated MCL.

11. Comment: The future costs (5-Year Review) associated with Alternative 1 should be included in the cost summary.

    Response: Although these costs have been added, consideration of "No Action" generally precludes conduct of 5-Year Reviews.

12. Comment: The Operation and Maintenance costs for Alternative 2 seem to be low.

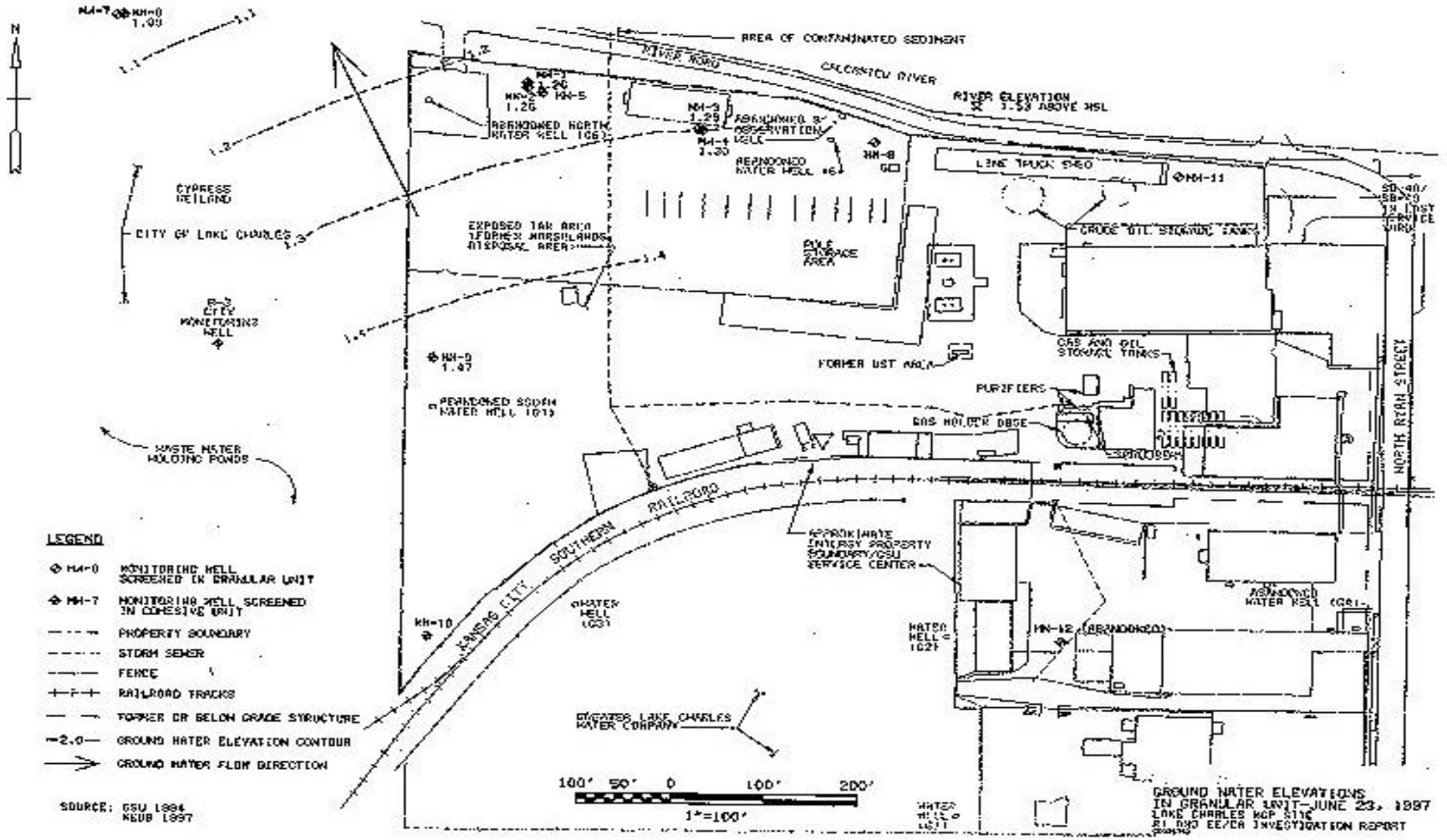
    Response: As part of this ROD, a revised cost summary table for this alternative - the selected remedy, has been included and the changes have been made accordingly.

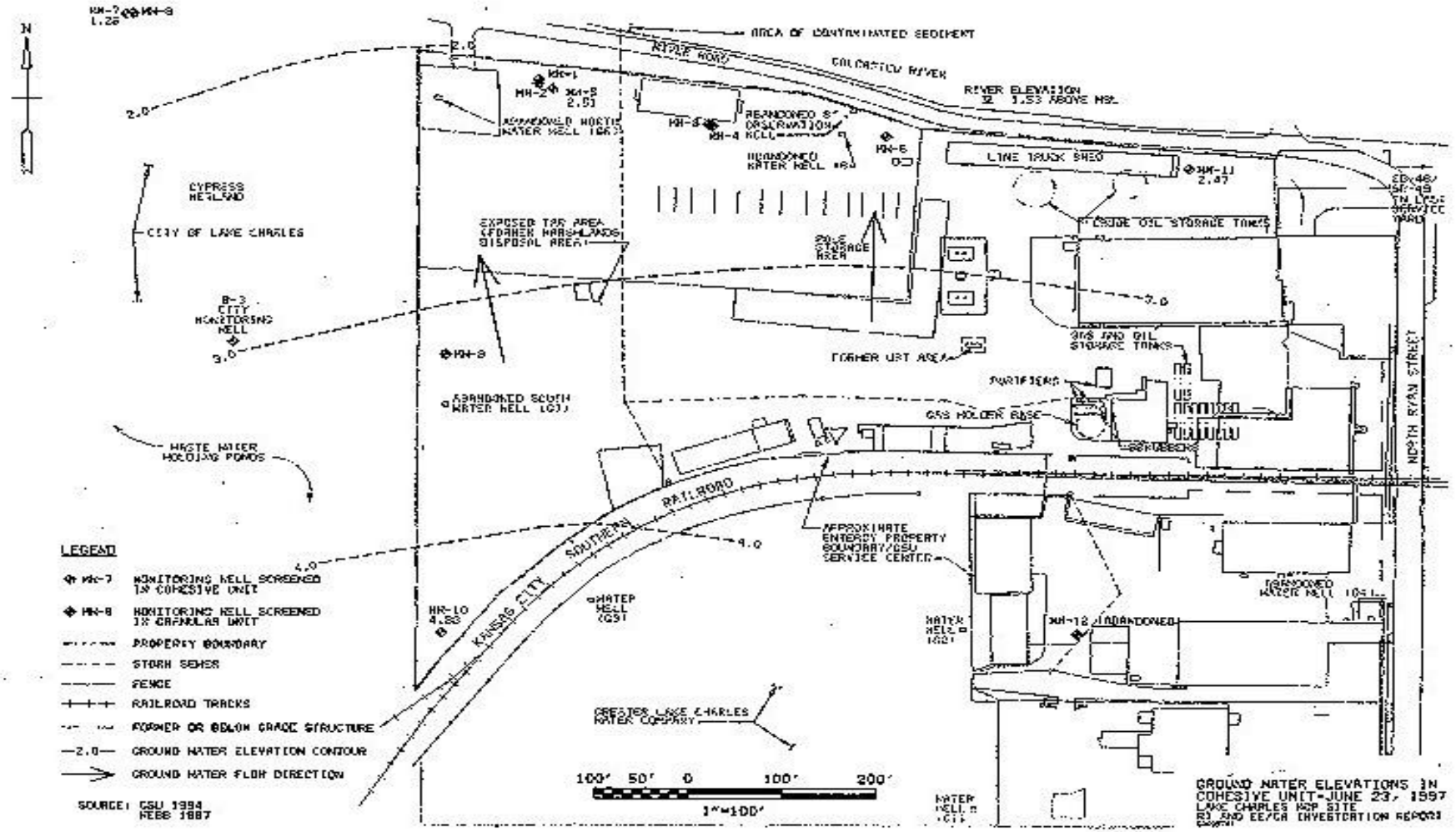
13. Comment: The city wells and surface water should not be evaluated for natural attenuation. Monitor of the city wells should be eliminated because they are upgradient of

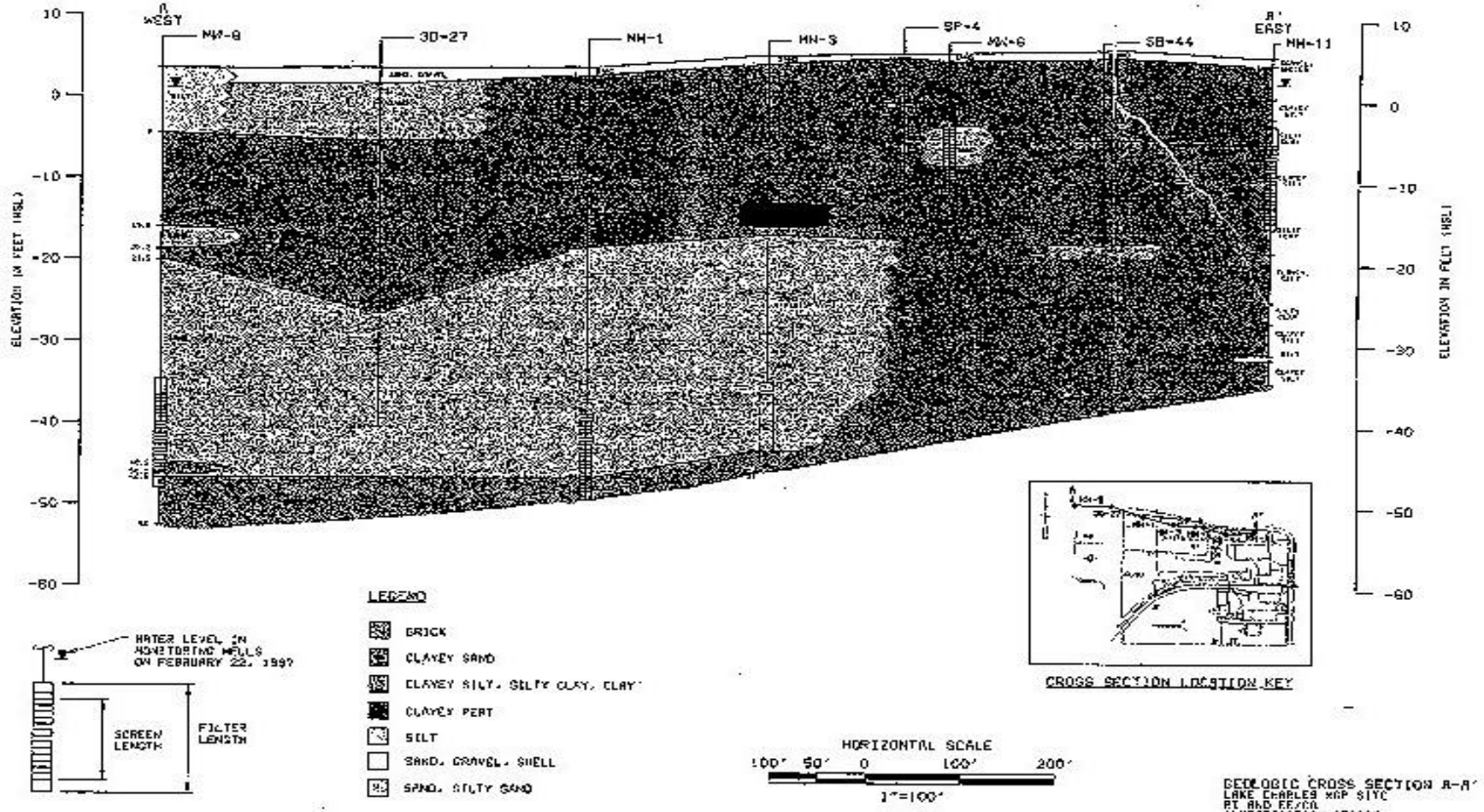
the site. The river surface water should be monitored only to confirm that there is no measurable impact from the contaminated site ground water.

Response: The city wells will remain in the program to be monitored on an annual basis, with the understanding that with further evaluation the monitoring program may require modifications. The language in the ROD has been changed to more clearly reflect the goal of assuring that no migration of contaminated ground water at levels exceeding any risk-based standards should occur into the Calcasieu River surface water. The city wells are not part of the natural attenuation monitoring program but rather part of a monitoring program to ensure that there is no risk to human health from contaminated ground water.

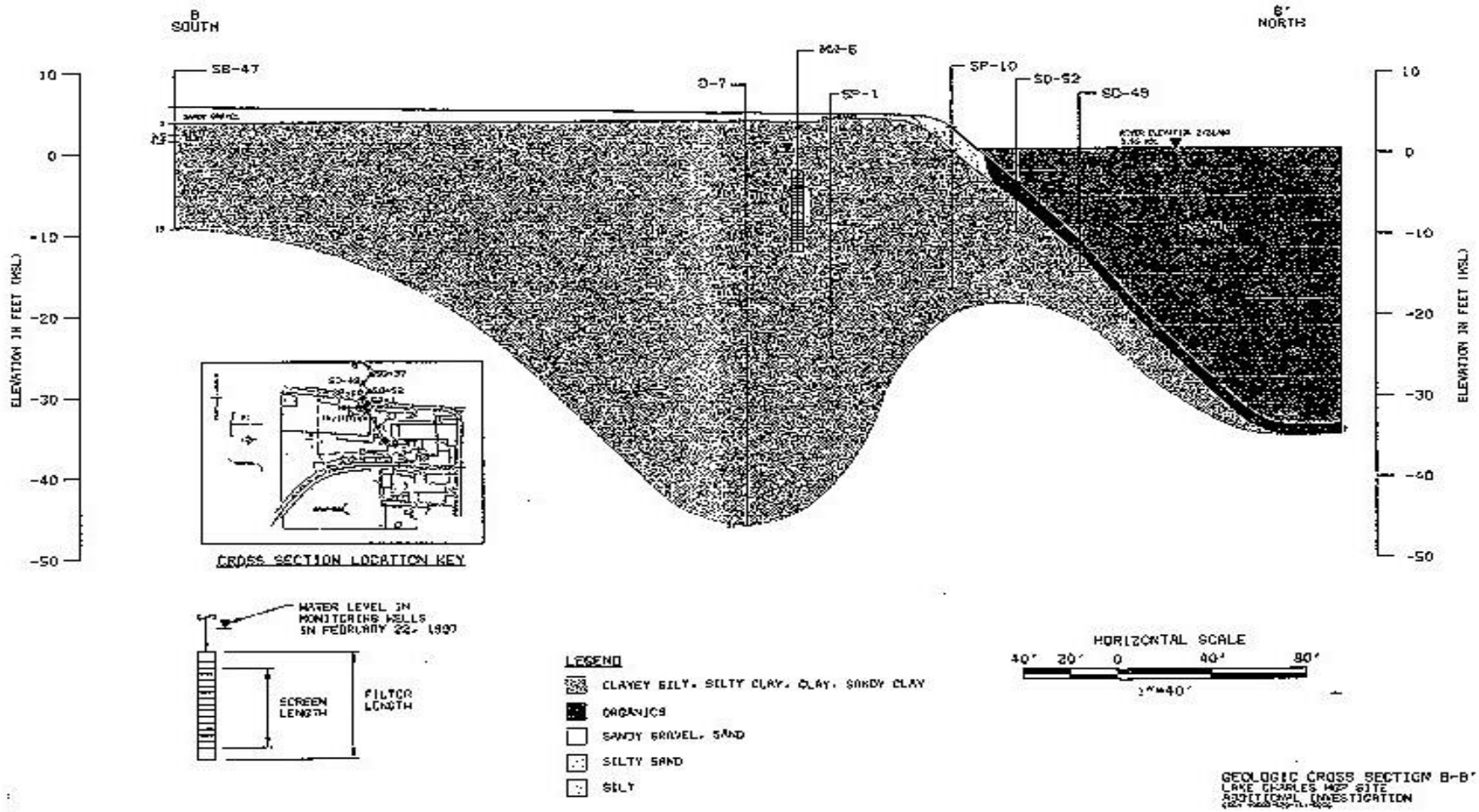
APPENDIX A
GROUND WATER FLOW MAPS AND GEOLOGIC CROSS SECTIONS


N
AREA OF CONTAMINATED SEDIMENT
RIVER ROAD
CALCASIEU RIVER
RIVER ELEVATION
1.53 ABOVE MSL
ABANDONED NORTH WATER WELL (GS)
ABANDONED 8" OBSERVATION WELL
ABANDONED WATER WELL #6
CYPRESS WETLAND
CITY OF LAKE CHARLES
EXPOSED TAR AREA (FORMER MARSHLANDS DISPOSAL AREA)
PILE STORAGE AREA
CRUDE OIL STORAGE TANKS
GAS AND OIL STORAGE TANKS
FORMER UST AREA
PURIFIERS
GAS HOLDER BASE
NORTH RYAN STREET
WASTE WATER HOLDING PONDS
ABANDONED SOUTH WATER WELL (GS)
KANSAS CITY SOUTHERN RAILROAD
APPROXIMATE ENTERGY PROPERTY BOUNDARY/CSU SERVICE CENTER
ABANDONED WATER WELL (GS)
WATER WELL (GS)
WATER WELL (GS)
ENTERGY LAKE CHARLES WATER COMPANY
100' 50' 0 100' 200'
1"=100'
LEGEND
MONITORING WELL SCREENED IN GRANULAR UNIT
MONITORING WELL SCREENED IN COHESIVE UNIT
PROPERTY BOUNDARY
STORM SEWER
FENCE
RAILROAD TRACKS
FORMER OR BELOW GRADE STRUCTURE
GROUND WATER ELEVATION CONTOUR
GROUND WATER FLOW DIRECTION
SOURCE: GSU 1994
NEUB 1997
GROUND WATER ELEVATIONS IN GRANULAR UNIT-JUNE 23, 1997
LAKE CHARLES MGP SITE
RI/FS EE/CA INVESTIGATION REPORT


N
AREA OF CONTAMINATED SEDIMENT
WATER ROAD
CALCASIEU RIVER
RIVER ELEVATION
1.53 ABOVE MSL
MH-1
MH-2
MH-3
MH-4
MH-5
MH-6
MH-11
2.47
2.51
ABANDONED NORTH WATER WELL (GS1)
ABANDONED 6" OBSERVATION
ABANDONED WATER WELL #6
LINE TRUCK SHED
CRUDE OIL STORAGE TANKS
CYPRESS WETLAND
CITY OF LAKE CHARLES
EXPOSED TAR AREA (FORMER MARSHLANDS DISPOSAL AREA)
B-3 CITY MONITORING WELL
3.0
GAS AND OIL STORAGE TANKS
FORMER UST AREA
PARTIENS
GAS HOLDER BASE
ABANDONED SOUTH WATER WELL (GS)
WASTE WATER HOLDING PONDS
SOUTHERN RAILROAD
KANSAS CITY
APPROXIMATE ENTERGY PROPERTY BOUNDARY/CSU SERVICE CENTER
NORTH RYAN STREET
ABANDONED WATER WELL (GS)
MW-10
4.83
WATER WELL (GS)
MW-12 (ABANDONED)
WATER WELL (GS)
CITGO
CREOLE LAKE CHARLES WATER COMPANY
100' 50' 0 100' 200'
1"=100'
WATER WELL (GS)
LEGEND
MW-7 MONITORING WELL SCREENED IN COHESIVE UNIT
MW-8 MONITORING WELL SCREENED IN GRANULAR UNIT
PROPERTY BOUNDARY
STORM SEWER
FENCE
RAILROAD TRACKS
FORMER OR BELOW GRADE STRUCTURE
2.0 GROUND WATER ELEVATION CONTOUR
GROUND WATER FLOW DIRECTION
SOURCE: CSU 1994
MEBB 1997
GROUND WATER ELEVATIONS IN COHESIVE UNIT-JUNE 23, 1997
LAKE CHARLES MGP SITE
RI AND EE/CA INVESTIGATION REPORT



GEOLOGIC CROSS SECTION A-A'
LAKE CHARLES MGP SITE
RI AND FS/CA
INVESTIGATION REPORT



GEOLOGIC CROSS SECTION B-B'
LAKE CHARLES MGP SITE
ADDITIONAL INVESTIGATION

APPENDIX B
SUMMARY OF CONTAMINANT LEVEL RANGES IN EACH WELL

Summary of Contaminant Level Ranges in Each Well

Contaminant Name	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Polycyclic Aromatic Hydrocarbons (PAHs)											
1-Methylnaphthalene	ND	ND	42	50	1	1600	ND	ND	130	ND	ND
2-Methylnaphthalene	ND	ND	39	52	2	1900	ND	ND	65	ND	ND
Acenaphthene	ND	0.1	8-45	2.5-25	0.3-21	24.2-550	ND	ND	6.6-66	ND	ND
Acenaphthylene	ND	0.2	3-92	50.7-80	0.7-69	616-4500	ND	ND	17-300	ND	ND
Anthracene	0.02	0.03	1-3	0.14-5	0.09-0.46	7.42-650	0.02	ND	2-9.8	ND	ND
Benzo(a)anthracene	ND	0.02	0.4	0.03-0.17	0.03-0.31	1.54-410	0.03	0.03	0.6	0.02	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	1-250	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	0.06	ND	0.1	0.24	10.3-110	0.03	0.03	0.7	0.03	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	5.99-84	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	0.02	ND	4.43-73	ND	ND	ND	ND	ND
Chrysene	ND	0.02	0.3	0.06-0.15	0.02-0.3	2.67-310	0.02	0.02	0.5	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	60	ND	ND	ND	ND	ND
Fluoranthene	0.04	0.04	0.8-13	0.2-1	0.1-1.08	8.19-4300	0.04	0.04	1	0.03	0.03
Fluorene	0.03	0.1	5-9	0.33-7	0.3-5	55.8-880	ND	0.03	25	0.03	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	7.1-81	ND	ND	ND	ND	ND
Naphthalene	ND	ND	0.69-4.5	230-480	4-300	2060-9400	ND	ND	780-1200	ND	ND
Phenanthrene	0.06	0.1	4-6.3	0.2-2.58	0.01-2.3	4.33-2300	0.06	0.04	7	0.03	0.03
Pyrene	ND	0.08	0.83-4.4	0.2-2	0.1-0.8	8.47-2200	0.06	0.06	1	ND	0.05
Volatile Organic Compounds (VOCs)											
1,2,4-Trimethylbenzene	ND	ND	1.5-2	17.9	ND	78.3-210	ND	ND	25.7	ND	ND
1,3,5-Trimethylbenzene	ND	ND	3-4.5	ND	ND	35.5-60	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	4	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	23-32	71	ND	5-14	ND	ND	ND
Benzene	ND	ND	4-32	25-78	ND	1800-2600	ND	ND	111-210	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
Ethylbenzene	ND	ND	ND	28-63	ND	847-1500	ND	ND	56.4-170	ND	ND
Isopropylbenzene	ND	ND	4.1	ND	ND	39	ND	ND	8.4	ND	ND
N-Propylbenzene	ND	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	4	ND	ND	2	ND	ND
Tert-Butylbenzene	ND	ND	ND	ND	ND	22.4	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	3-10	ND	1000-1500	ND	ND	31-48	ND	ND
Total Xylenes	ND	ND	1-6	8.1-39	ND	720-1100	ND	ND	22.2-90	ND	ND

All concentrations presented in µg/L.
These results are from ground water monitoring events conducted in 1997, 1998 and 1999.
ND - Not Detected

APPENDIX C
EXPOSURE POINT CONCENTRATIONS

SURFACE WATER EXPOSURE POINT CONCENTRATIONS						
	Drainage Ditch and Wetland Surface Water Concentrations(1) (mg/L)			Calcasieu River Surface Water Concentrations(2) (mg/L)		
Parameter	95 th UCL	Max	Exp Point	95 th UCL	Max	Exp Point
Volatile Organics:						
Bromodichloromethane	0.0004	0.0002	0.0002	ND	ND	ND
Bromoform	0.003	0.0006	0.0006	ND	ND	ND
Chloroform	0.005	0.003	0.003	0.05	0.0002	0.0002
Dibromdichloramethane	0.001	0.002	0.001	ND	ND	ND
Methylene Chloride	0.004	0.0002	0.0002	ND	ND	ND
Toluene	0.06	0.02	0.02	0.03	0.0001	0.0001
PAHs:						
Anthracene	0.001	0.0007	0.0007	0.0004	0.001	0.0004
Benzo(a)anthracene	0.0002	0.0003	0.0002	ND	ND	ND
Benzo(a)pyrene	0.0002	0.0003	0.0002	ND	ND	ND
Benzo(b)fluoranthene	0.0005	0.0003	0.0003	ND	ND	ND
Benzo(g,h,i)perylene	0.0006	0.0002	0.0002	ND	ND	ND
Chrysene	0.0003	0.0003	0.0003	ND	ND	ND
Fluoranthene	0.002	0.001	0.001	0.0002	0.0004	0.0002
Indeno(1,2,3-cd)pyrene	0.0003	0.0002	0.0002	ND	ND	ND
Naphthalene	0.01	0.02	0.01	0.002	0.002	0.002
Phenanthrene	0.0004	0.0003	0.0003	ND	ND	ND
Pyrene	0.0004	0.0006	0.0004	0.0004	0.0007	0.0004
Miscellaneous:						
4-Methylphenol	--	0.008	0.008	ND	ND	ND
Aldrin	--	0.00001	0.00001	ND	ND	ND
Alpha-Chlordane	--	0.00001	0.00001	ND	ND	ND
Di-N-Butylphthalate	ND	ND	ND	--	0.007	0.007
Dieldrin	--	0.00002	0.00002	ND	ND	ND
Endosulfan II	--	0.000004	0.000004	ND	ND	ND
Endrin	--	0.00002	0.00002	ND	ND	ND
Endrin Ketone	--	0.00001	0.00001	ND	ND	ND
Phenol	--	0.005	0.005	ND	ND	ND
Metals:						
Aluminum	900,000	64.6	64.6	1.31	1.21	1.21
Arsenic	3,000	0.007	0.007	0.005	0.005	0.005
Antimony	14.3	0.002	0.002	ND	ND	ND
Barium	4.0	3.99	3.99	0.11	0.10	0.10
Beryllium	14	0.01	0.01	0.001	0.002	0.001
Cadmium	0.41	0.02	0.02	ND	ND	ND
Calcium	1,311	782	782	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Cobalt	5,489	0.04	0.04	ND	ND	ND
Copper	$1X10^{9}$	2.41	2.41	0.004	0.006	0.004
Iron	200,000	181	181	NA	NA	NA
Lead	500	0.46	0.46	0.007	0.004	0.004
Magnesium	NA	NA	NA	352,535	667	667
Manganese	20	9.97	9.97	NA	NA	NA
Mercury	1.0	0.003	0.003	ND	ND	ND
Nickel	0.40	0.01	0.01	0.01	0.005	0.005
Selenium	ND	ND	ND	NA	NA	NA
Silver	0.07	0.01	0.01	ND	ND	ND
Sodium	528	354	354	366,228	5,780	5,780
Thallium	ND	ND	ND	0.004	0.005	0.004
Vanadium	$3X10^{11}$	0.11	0.11	0.003	0.003	0.00

Abbreviations:

Max Maximum.

NA Not applicable, exposure point concentration not calculated for metal because maximum concentration detected is less than RDA (Table 8).

ND Not detected.

UCL Upper Confidence Limit.

mg/L Milligram per liter.

-- 95th percentile UCL not calculated because sample number is five or less.

Notes:

(1) Exposure concentrations calculated using data from locations SW-1, SW-2, SW-3, SW-4, SW-21, SW-22, and SW-23.

(2) Exposure concentrations calculated using data from locations SW-13, SW-14, SW-15, SW-17, SW-18, SW-19, and SW-20.

GROUND WATER EXPOSURE POINT CONCENTRATIONS			
	Ground Water Concentrations[(1)] (µg/L)		
Parameter	**95 th UCL**	**Maximum**	**Exposure Point**
Volatile Organics:			
1,2,4-Trimethylbenzene	**101**	**25.7**	**25.7**
1,3,5-Trimethylbenzene	**44.9**	**3.00**	**3.00**
Acetone	**280**	**14.0**	**14.0**
Benzene	**27,975**	**210**	**210**
Ethylbenzene	**11,680**	**170**	**170**
Isopropylbenzene	**50.9**	**8.40**	**8.40**
Total Xylenes	**666**	**120**	**120**
Toluene	**206**	**48.0**	**48.0**
PAHs:			
Acenaphthene	**706**	**37.0**	**37.0**
Acenaphthylene	**$9.1x10^{7}$**	**300**	**300**
Anthracene	**62.0**	**9.80**	**9.80**
Fluoranthene	**20.7**	**13.0**	**13.0**
Fluorene	**303**	**8.60**	**8.60**
Naphthalene	**$1.8x10^{11}$**	**1,200**	**1,200**
Phenanthrene	**107**	**6.08**	**6.08**
Pyrene	**34.6**	**4.40**	**4.40**
Metals:			
Aluminum	**46,452**	**29,500**	**29,500**
Antimony	**13.2**	**1.30**	**1.30**
Arsenic	**40.7**	**19.9**	**19.9**
Barium	**762**	**844**	**762**
Beryllium	**1.07**	**1.10**	**1.07**
Chromium	**7.44**	**24.4**	**7.44**
Cobalt	**4.68**	**3.50**	**3.50**
Iron	**22,928**	**28,700**	**22,928**
Lead	**17.2**	**27.5**	**17.2**
Magnesium	**36,040**	**51,500**	**36,040**
Manganese	**1,814**	**2,020**	**1,814**
Nickel	**5.74**	**8.00**	**5.74**
Selenium	**2.40**	**3.10**	**2.40**
Sodium	**330,484**	**900,000**	**330,484**
Thallium	**20.3**	**4.90**	**20.3**
Vanadium	**17.2**	**28.1**	**17.2**

Abbreviations:

UCL **Upper Confidence Limit.**

µg/L **Micrograms per liter.**

Note:

(1) **On the basis of well yield, exposure concentrations calculated using quarterly 1997 ground water data from monitoring well locations MW-1, MW-2, MW-3, MW-4, MW-8, and MW-9. Chemicals not listed were not detected in any of these wells.**

APPENDIX D
EXPOSURE PARAMETERS USED IN CALCULATING HIFS

Parameter	Population	Value	Reference
Exposure Duration (ED)	Child Resident	Soil Ingestion-6 yrs	EPA 1991a
	Adult Resident	Soil Ingestion-24 yrs All Other Exposures-30 yrs	EPA 1991a
	Adult Utility Worker	25 yrs	EPA 1991a
	Adult Construction Worker	1 yr	Site-specific assumption(1)
Averaging Time (AT)	All Populations	Noncarcinogenic-ED Carcinogenic-70 yrs	EPA 1991a
Ingestion Rate (IR)	Child Resident	Soil-200 mg/day	EPA 1991a
	Adult Resident	Soil-100 mg/day Fish-54 g/day (recreational)(2) Fish-132 g/day (subsistence)(2) Air-20 m^3/day	EPA 1991a EPA 1991a EPA 1991a EPA 1995a
	Adult/Child Trespasser	Soil-100 mg/day Water-0.25 L/day	EPA 1995a Assumed
Ingestion Rate (IR) (Continued)	Adult Utility/ Construction Worker	Soil-480 mg/day Surface Water-0.25 L/day Drinking Water-1L/day Air-20 m^3/day	EPA 1991a Assumed EPA 1995a EPA 1995a
Exposure Frequency (EF)	Adult/Child Resident	350 days/yr or events/yr	EPA 1991a
	Adult/Child Trespasser	60 days/yr or events/yr	EPA 1995a

Parameter	Population	Value	Reference
	Adult Construction Worker	125 days/yr or events/yr	Assumed per EPA 1991a
	Adult Utility Worker	5 days/yr or events/yr	Assumed per EPA 1991a
	Adult Worker (Drinking Water)	250 days/yr	EPA 1995a
Contact Rate (CR)	Adult Utility/ Construction Worker; Adult/ Child Trespasser/ Recreational User	50 mL/hour	EPA 1995a
Event Time (ET)	Adult/Child Trespasser/ Recreational User Worker (Shower)	1 hour	EPA 1995a
	Adult Worker (Shower)	10 minutes	EPA1992c
Event Frequency (EV)	Adult/Child Trespasser/ Recreational User	1 event/day	EPA 1995a
	Adult Utility/ Construction Worker	1 event/day	Site-specific assumption
Body Weight (BW)	Child	15 kg	EPA 1991a
	Adult	70 kg	EPA 1991a

Parameter	Population	Value	Reference
Body Surface Area (SA)	Adult/Child Trespasser	5,000 cm^2	EPA 1995a
	Adult Worker	2,000 cm^2 (head and hands); 20,000 cm^2 (body)	EPA 1992c
Fraction Ingested (FI)	All Populations	1.0	EPA 1989b
Absorbance Factors (ABS)	All Populations	Benzene-0.0005 Other VOCs w/vapor pressure < benzene-0.03 SemiVOCs-0.10 PCBs-0.06 Cadmium-0.01 Arsenic-0.032 Other Metals-0.01	Ryan 1987 EPA 1995c
Volatilization Factor (VF)	All Populations	See Table 4 for chemical-specific values	EPA 1991c
Permeability Constant (PC, K_p)	All Populations	See Table 4 for chemical-specific values	EPA 1992c
Soil Adherence Factor (AF)	All Populations	1.0	EPA 1992c
Particulate Emission Factor (PEF)	All Populations	4.63×10^9 m^3/kg	EPA 1991c
Critical Time (t*)	All Populations	See Table 4 for chemical-specific values	EPA 1992c
J	All Populations	See Table 4 for chemical-specific values	EPA 1992c
B	All Populations	See Table 4 for chemical-specific values	EPA 1992c

Parameter	Population	Value	Reference
Duration of Event (t_{event})	**Adult/Child Trespasser**	**0.5 hour**	**Site-specific Assumption per EPA 1992c**
	Utility/Construction Worker	**1 hour**	**Site-specific Assumption per EPA 1992**
Conversion Factors	**NA**	**10^{-6} kg/mg 365 days/year 10^{-3} L/m^3**	**NA**

Notes:

(1) **An exposure duration of one year was assumed for the construction worker population because any construction activities that may take place would be expected to occur once and be completed in less than one year.**

(2) **The Louisiana Department of Wildlife and Fisheries was contacted regarding the availability of ingestion rates specific to the Calcasieu River; however, consumption data are not collected in the state (Reed 1997). Creel surveys are completed for several lakes downstream of the site, toward the Gulf of Mexico. However, they are primarily marine fishery surveys and do not provide an indication of the actual consumption because the fish and shellfish are shipped across the U.S. The area of the Calcasieu River north of the site is not used by commercial fisherman. The state provides health advisories for the Calcasieu River; however, there are none for the area of the river near the site. The shoreline fisherman would have to be surveyed on a one-on-one basis to provide a realistic indication of local consumption rates. Depending on the results of the risk characterization, a survey of the local fisherman may be warranted.**

CHEMICAL-SPECIFIC EXPOSURE PARAMETERS

Chemicals of Concern	VF	Kp	t*	t	B
VOCs					
1,2,4-Trimethylbenzene	1	NA	NA	NA	NA
1,3,5-Trimethybenzene	1	NA	NA	NA	NA
2-Butanone	1	0.0011	0.58	0.24	0.00019
Acetone	1	NA	NA	NA	NA
Benzene	1	0.11	0.63	0.26	0.013
Bromodichloromethane	1	0.0058	2.1	0.87	0.012
Bromoform	1	0.0026	7.3	3	0.023
Carbon Disulfide	1	0.5	0.65	0.27	0.017
Chloroform	1	0.0089	1.1	0.47	0.0093
Dibromochloromethane	1	NA	NA	NA	NA
Ethylbenzene	1	1.0	1.3	0.39	0.14
Isopropylbenzene	1	NA	NA	NA	NA
Methylene Chloride	1	0.0045	0.69	0.29	0.0018
sec-Butylbenzene	1	NA	NA	NA	NA
tert-Butylbenzene	1	NA	NA	NA	NA
Toluene	1	1.0	0.77	0.32	0.054
Xylene (m-)	1	0.08	1.4	0.39	0.16
Semi-VOCs					
Arochlor-1242	0.1	0.00245	NA	NA	NA
Arochlor-1248	0.1	0.00245	NA	NA	NA
Arochlor-1260	0.1	0.00245	NA	NA	NA
4-4'-DDE	0.1	0.24	36	7.6	49
4-4'-DDT	0.1	0.43	60	13	230
Aldrin	0.1	0.0016	36	15	0.1
Alpha-Chlordane	0.1	0.052	130	28	35
Dieldrin	0.1	0.016	94	18	3.6
Endosulfan II	0.1	NA	NA	NA	NA
Endrin	0.1	0.016	94	18	3.6
Endrin Ketone	0.1	NA	NA	NA	NA
Phenol	0.1	0.0055	0.79	0.33	0.0029
4-Methyphenol	0.1	NA	NA	NA	NA
2,4-Dimethylphenol	0.1	0.015	1.2	0.49	0.02
Di-N-butylphthalate	0.1	NA	NA	NA	NA
Dibenzofuran	0.1	NA	NA	NA	NA
1-Methylnaphthalene	0.1	NA	NA	NA	NA
2-Methylnaphthalene	0.1	NA	NA	NA	NA
Acenaphthene	0.1	NA	NA	NA	NA
Acenaphthylene	0.1	NA	NA	NA	NA
Anthracene	0.1	NA	NA	NA	NA
Benzo(a)Anthracene	0.1	0.81	10	2.2	46
Benzo(a)Pyrene	0.1	1.2	14	2.9	13
Benzo(b)Fluoranthene	0.1	1.2	14	3	13
Benzo(g,h,i)Perylene	0.1	NA	NA	NA	NA
Benzo(k)Fluoranthene	0.1	NA	NA	NA	NA

Chemicals of Concern	VF	Kp	t*	t	B
Chrysene	0.1	0.81	10	2.2	46
Dibenzo(a,h)Anthracene	0.1	2.7	21	4.4	690
Fluoranthene	0.1	0.36	7.3	1.5	8.9
Fluorene	0.1	NA	NA	NA	NA
Indeno(1,2,3-cd)Pyrene	0.1	1.9	20	4.2	380
Naphthalene	0.1	0.069	2.2	0.53	0.2
Phenanthrene	0.1	0.232	5.6	1.1	2.9
Pyrene	0.1	NA	NA	NA	NA
Inorganics					
Aluminum	0	0.001(1)	NA	NA	NA
Antimony	0	0.001(1)	NA	NA	NA
Arsenic	0	0.001(1)	NA	NA	NA
Barium	0	0.001(1)	NA	NA	NA
Beryllium	0	0.001(1)	NA	NA	NA
Cadmium and compounds	0	0.001(1)	NA	NA	NA
Calcium	0	0.001(1)	NA	NA	NA
Chromium (III)	0	0.001(1)	NA	NA	NA
Chromium (VI)	0	0.002	NA	NA	NA
Cobalt	0	0.0004	NA	NA	NA
Copper	0	0.001(1)	NA	NA	NA
Iron	0	0.001(1)	NA	NA	NA
Lead	0	0.00014	NA	NA	NA
Magnesium	0	0.001(1)	NA	NA	NA
Manganese and compounds	0	0.001(1)	NA	NA	NA
Manganese (water)	0	0.001(1)	NA	NA	NA
Mercury	0	0.001	NA	NA	NA
Nickel	0	0.001	NA	NA	NA
Potassium	0	0.001(1)	NA	NA	NA
Selenium	0	0.001(1)	NA	NA	NA
Silver	0	0.0006	NA	NA	NA
Sodium	0	0.001(1)	NA	NA	NA
Thallium	0	0.001(1)	NA	NA	NA
Vanadium	0	0.001(1)	NA	NA	NA
Zinc	0	0.0006	NA	NA	NA

Abbreviations:

VF Volatilization coefficient (unitless).

Kp Permeability coefficient for water exposure (cm/hour).

t* Critical time for water exposure (hour).

t Chemical-specific parameter for water exposure (unitless).

B Chemical-specific parameter for water exposure (unitless).

Note:

(1) Default value concentration per EPA 1992c.

APPENDIX E
CHEMICAL-SPECIFIC TOXICITY VALUES

CHEMICAL-SPECIFIC TOXICITY VALUES
INGESTION, INHALATION, AND DERMAL EXPOSURES

Chemicals of Concern	Ingestion Exposures					Inhalation Exposures						Dermal Exposures					
	SF (mg/kg-day)	Wt of Ev	RfD (mg/kg-day)	Ref	Target Organ/ System	SF (kg-day/mg)	Wt of Ev	RfD (mg/kg-day)	Ref	Volatilization Rate	Target Organ/ System	Oral Absorption Efficiency (percent)	Oral Absorption Efficiency Reference	Extrapolated RfD (mg/kg-day)	Extrapolated SF (kg-day/mg)	PC[1] (cm/hr)	Soil Absorption Factor[2] (unitless)
Volatiles																	
1,2,4-Trimethylbenzene			5.00E-02	E				1.70E-05	E	1.00E+00				2.50E-05			5.00E-04
1,3,5-Trimethylbenzene			5.00E-02	E				1.70E-03	E	1.00E+00				2.50E-03			5.00E-02
2-Butanone		D	6.00E-01	I	liver		D	2.86E-01		1.00E+00	CNS			3.00E-02		1.1x10[-1]	3.00E-02
Acetone		D	1.00E-01	I	fetotoxic					1.00E+00				5.00E-03			5.00E-02
Benzene	2.90E-02	A		I	stomach/nasal	2.90E-02	A	8.57E-03	I	1.00E+00	leukemia	9.00E+01	ATSDR 1995		2.61E-02	1.10E-01	5.00E-04
Bromodichloromethane	6.20E-02	B2	2.00E-02	I	liver,kidney		B2			1.00E+00				1.00E-03	3.10E-02	5.80E-03	5.00E-02
Bromoform	7.90E-03	B2	2.00E-02	I	liver,kidney		B2	3.90E-03	I	1.00E+00	CNS, liver, kidney			1.00E-03	3.95E-04	2.60E-01	5.00E-02
Carbon Disulfide			1.00E-01	I	adrenal/liver			2.00E-01	I	1.00E+00	N.A.			5.00E-03		9.00E-01	5.00E-02
Chloroform	6.10E-03	B2	1.00E-02	I	circulatory system	8.10E-02	B2	8.60E-05	E	1.00E+00	adrenal/liver, CNS	1.00E+02	ATSDR 1997	1.00E-02	6.10E-03	8.50E-01	5.00E-02
Dibromochloromethane	8.40E-02	C	2.00E-02	I	liver, blood		C			1.00E+00				1.00E-03	4.20E-02		5.00E-02
Ethylbenzene		D	1.00E-01	I	hepatic/RBCs		D	2.86E-01		1.00E+00		9.10E+01	ATSDR 1990	9.10E-02		1.00E+00	5.00E-02
Isopropylbenzene										1.00E+00							5.00E-02
Methylene Chloride	7.50E-03	B2	6.00E-02	I	liver,kidney	1.60E-03	B2	8.60E-01	H	1.00E+00	lung, liver / NA	5.50E+01	ATSDR 1997	3.30E-02	4.13E-03	4.50E-01	5.00E-02
sec-Butylbenzene			1.00E-02	E						1.00E+00				1.00E-01			5.00E-02
tert-Butylbenzene			1.00E-02	E						1.00E+00				5.00E-04			5.00E-02
Toluene		D	2.00E-01	I	liver, kidney		D	1.10E-01	I	1.00E+00	CNS, eye, nose			1.00E-02		1.00E+00	5.00E-02
Total Xylenes		D	2.00E+00	I	fetotoxic		D	8.60E-02	W	1.00E+00	CNS, nose, throat	9.10E+01	ATSDR 1995	1.84E+00		8.00E-02	5.00E-02
Semivolatiles																	
Aroclor 1242	2.00E+00	B2		I	liver		B2		I	1.00E-01	NA	9.00E+01	ATSDR 1993		1.80E+00	2.50E-03	6.00E-02
Aroclor 1248	2.00E+00	B2		I	liver		B2		I	1.00E-01	NA	9.00E+01	ATSDR 1993		1.80E+00	2.50E-03	6.00E-02
Aroclor 1260	2.00E+00	B2		I	blood, liver		B2		I	1.00E-01	NA	9.00E+01	ATSDR 1993		1.80E+00	2.50E-03	6.00E-02
4-4'-DDE	3.40E-01	B2		I	liver, CNS		B2			1.00E-01					1.90E-02	2.40E-01	1.00E-01
4-4'-DDT	3.40E-01	B2		I	fetotoxic		B2			1.00E-01					1.70E-02	4.50E-01	1.00E-01
Aldrin	1.70E+01	B2	3.00E-05	I	liver	1.70E+01	B2		E	1.00E-01		Unknown	ATSDR 1993			1.60E-03	1.00E-01
Alpha-Chlordane	1.30E-01	B2	5.00E-04	I	liver	1.30E-01	B2	2.00E-04	I	1.00E-01				2.50E-05	1.73E-02	5.20E-02	1.00E-01
Dieldrin	1.60E+01	B2	5.00E-05	I	liver	1.60E+01	B2		E	1.00E-01		Unknown	ATSDR 1993			1.60E-02	1.00E-01
Endosulfan II			6.00E-03	I	liver					1.00E-01				3.00E-04		1.50E-01	1.00E-01
Endrin			3.00E-04	I						1.00E-01		Unknown	ATSDR 1989			1.60E-02	1.00E-01
Endrin Ketone					liver					1.00E-01							1.00E-01
Phenol		D	6.00E-01	I						1.00E-03				3.00E-02		5.90E-03	1.00E-01
4-Methylphenol		C	5.00E-03	H			C			1.00E-01				2.50E-04			1.00E-01
2,4-Dimethylphenol			2.00E-02	E						1.00E-01				1.00E-03		1.50E-02	1.00E-01
Di-n-butylphthalate		D	1.00E-01	L						1.00E-01		9.70E+01	ATSDR 1989	9.70E-02			1.00E-01
Diethylphthalate	4.00E-03			E						1.00E-01					2.00E-04		1.00E-01
1-Methylnaphthalene										1.00E-01							1.00E-01
2-Methylnaphthalene			4.00E-02	S	GI tract					1.00E-01				2.00E-03			1.00E-01
Acenaphthene			6.00E-02	I	eyes					1.00E-01				3.00E-03			1.00E-01
Acenaphthylene		D		H						1.00E-01							1.00E-01
Anthracene		D	3.00E-01	I	inc mortality					1.00E-01		7.10E+01	ATSDR 1995	2.13E-01			1.00E-01
Benzo(a)Anthracene	7.30E-01	B2		S	NA	6.10E-01	B2		E	1.00E-01	NA	3.00E+02	ATSDR 1990			9.10E-03	1.00E-01
Benzo(a)Pyrene	7.30E+00	B2		I	NA	6.10E+00	B2		W	1.00E-01	NA	8.00E+01	ATSDR 1995			1.20E+00	1.00E-01
Benzo(b)Fluoranthene	7.30E-01	B2		S	NA	6.10E-01	B2		E	1.00E-01	NA	Unknown	ATSDR 1990			1.20E+00	1.00E-01
Benzo(g,h,i)Perylene		D		I	lungs					1.00E-01							1.00E-01
Benzo(k)Fluoranthene	7.30E-02	B2		S	NA	6.10E-02	B2		E	1.00E-01	NA						1.00E-01
Chrysene	7.30E-03	B2		S	liver/liver	6.10E-03	B2		E	1.00E-01	NA	4.60E+01	ATSDR 1990			9.10E-02	1.00E-01
Dibenz(a,h)Anthracene	7.30E+00	B2		S		6.10E+00	B2		E	1.00E-01	NA	9.00E+01	ATSDR 1990				1.00E-01
Fluoranthene		D	4.00E-02	I	kidney					1.00E-01				2.00E-03		2.60E-02	1.00E-01
Fluorene		D	4.00E-02	I						1.00E-01				2.00E-03			1.00E-01
Indeno(1,2,3-cd)Pyrene	7.30E-01	B2		S	NA	6.10E-01	B2		E	1.00E-01	NA					1.90E+00	1.00E-01
Naphthalene		D	4.00E-02	W	uptake capsule					1.00E-01		Unknown	ATSDR 1996	2.00E-03		6.50E-02	1.00E-01
Phenanthrene		D		I	NA					1.00E-01		9.10E+01	ATSDR 1995			2.30E-01	1.00E-01
Pyrene		D	3.00E-02	I	liver					1.00E-01		9.20E+01	ATSDR 1995	2.76E-02			1.00E-01

CHEMICAL-SPECIFIC TOXICITY VALUES
INGESTION, INHALATION, AND DERMAL EXPOSURES

	Ingestion Exposures					Inhalation Exposures						Dermal Exposures					
Chemicals of Concern	SF mg/kg day	WT of EV	RfD mg/kg day	Ref	Target Organ/ System	SF kg day/mg	WT of EV	RfD mg/kg day	Ref	Volatilization Rate	Target Organ/ System	Oral Absorption Efficiency percent	Oral Absorption Efficiency Reference	Extrapolated RfD mg/kg day	Extrapolated SF kg day/mg	PC[1] cm/hr	Soil Absorption Factor[1][2] (unitless)
Inorganics																	
Aluminum			1.00E+00	E	serum chemistry					0.00E+00				5.00E-02		1.00E-03	1.00E-02
Antimony			4.00E-04	I	skin					0.00E+00				2.00E-05		1.00E-03	1.00E-02
Arsenic	1.50E+00	A	3.00E-04	I	increased BP	1.5E+01	A		I	0.00E+00	respiratory tract	9.50E+01	ATSDR 1998	2.85E-04	1.47E+00	8.60E-04	3.20E-02
Barium			7.00E-02	I	NA			1.40E-04	H	0.00E+00	fetotoxic	5.00E+00	ATSDR 1992	3.50E-03		1.00E-03	1.00E-02
Beryllium	4.30E+00	B1	5.00E-03	I	kidney	8.4E+00	B2		I	0.00E+00	lung	Unknown	ATSDR 1997	2.50E-04	2.15E-01	2.30E-03	1.00E-02
Cadmium and compounds		B1	5.00E-04	I		6.30E+00		2.70E-03	I	0.00E+00		2.50E+01	ATSDR 1993	1.25E-04		1.40E-03	1.00E-02
Chromium (III)		D	1.50E+00	I		5.70E-07				0.00E+00		4.00E-01	ATSDR 1997	1.00E-03		1.00E-03	1.00E-02
Chromium (VI)		A	5.00E-03	I		4.20E+01	A	5.70E-07	W	0.00E+00	lung / nasal	1.00E+01	ATSDR 1993	5.00E-04		2.10E-01	1.00E-02
Cobalt			6.00E-02	B						0.00E+00				3.00E-03		2.00E-03	1.00E-02
Iron			3.00E-01	S						0.00E+00				1.50E-02		1.00E-03	1.00E-02
Lead		B2								0.00E+00		9.00E+00	ATSDR 1993			1.40E-04	1.00E-02
Magnesium					CNS					0.00E+00						1.00E-03	1.00E-02
Manganese and compounds		D	2.30E-02	I	Kidney		D	1.40E-05	I	0.00E+00	respiratory, CNS			1.15E-03		1.00E-03	1.00E-02
Manganese (water)		D	5.00E-03	I						0.00E+00				2.50E-04		1.00E-03	1.00E-01
Mercury		D	3.00E-04	H	dec body wt			8.60E-05	H	0.00E+00	neurotoxicity	4.00E+01	ATSDR 1994	1.20E-04		1.00E-03	1.00E-02
Nickel and compounds			2.00E-02	I			A		H	0.00E+00	respiratory tract	3.00E+00	ATSDR 1987	6.00E-04		1.00E-03	1.00E-02
Silver and compounds		D	5.00E-03	I						0.00E+00		2.00E+01	ATSDR 1990	1.00E-03		6.00E-04	1.00E-02
Sodium				H	blood					0.00E+00						1.00E-03	1.00E-02
Thallium			8.00E-05	I	NA					0.00E+00				4.00E-06		1.00E-03	1.00E-02
Vanadium			7.00E-03	H	red blood cells					0.00E+00				3.50E-04		1.00E-03	1.00E-02

Abbreviations:

I - Integrated Risk Information System (as of January 1, 1999).

H - Health Effects Assessment Summary Tables (as of January 1, 1999)

E - EPA-NCEA Region Support provisional value.

S - Superfund Technical Support Center, National Center for Environmental Assessment, Risk Assessment Issue Paper

W - Value withdrawn from HEAST/IRIS.

RfD = Reference Dose

PC = Permeability Constant

SF = Slope Factor

WT OF EV = Weight of Evidence Classification

Notes:

[1] EPA 1992b.

[2] EPA 1995b

APPENDIX F
SUMMARY OF UNCERTAINTIES

SUMMARY OF UNCERTAINTIES ASSOCIATED WITH THE BASELINE RISK ASSESSMENT PROCESS

Uncertainty Parameter	Degree of Impact	Impact Affect to Risk	Sensitivity/Range of Uncertainty
Data Assessment			
Using one-half the sample quantitation limit for not detected chemicals in calculating exposure point concentrations.	Moderate	Over/under-estimate	If chemical has elevated sample quantitation limits, exposure concentrations may be overestimated.
Calculating upper confidence limits for exposure point concentrations.	Moderate	Overestimate	The chemical's bioavailability and fate and transport are not taken into consideration.
Using maximum concentration detected as exposure point concentration when calculated upper confidence limit is greater than the maximum value.	High	Overestimate	An actual average intake was not used to calculate the risk associated with many chemicals detected on site. The chemical's bioavailability and fate and transport are not taken into consideration.
Modeling fish and shellfish concentrations from sediment and surface water data.	Moderate	Overestimate	Most conservative bioacculmulation factor was used in calculation, regardless of species.
Using highest modeled fish and shellfish concentrations, regardless of whether chemical was detected in both sediment and surface water.	High	Overestimate	More chemicals were detected in the sediment than in the surface water and at higher concentrations, resulting in higher modeled tisssue concentrations.
Exposure Assessment			
Assumption that concentration values remain constant for lifetime exposures.	High	Overestimate	Depends on type of chemical. Organic compounds are expected to break down from natural attenuation or to volatilize quickly, whereas metals and some heavier organics are more persistent.
Use of dermal uptake model.	High	Overestimate	Certainty depends on characteristics of chemical and environmental media.
Exposure frequency assumptions.	Moderate	Overestimate	On basis of site activity and surrounding land use, it is difficult to predict actual frequency of exposure.
Exposure duration assumptions.	Moderate	Overestimate	On basis of site activity and surrounding land use, it is difficult to predict actual duration of exposure.
Ingestion rate assumptions.	Moderate	Overestimate	On basis of site activity and surrounding land use, it is difficult to predict actual ingestion rates.

Uncertainty Parameter	Degree of Impact	Impact Affect to Risk	Sensitivity/Range of Uncertainty
Dermal absorption factor assumptions.	**High**	**Over/under-estimate**	**The lack of dermal toxicity studies to support the extrapolation of dermal toxicity factors from dermal absorption factors and oral toxicity data makes the resultant risk highly uncertain.**
Surface area assumptions.	**Moderate**	**Over/under-estimate**	**On basis of site activity and surrounding land use, it is difficult to predict actual exposure areas. Surface area is not likey a constant from exposure to exposure.**
Toxicity Assessment			
Use of dose-response data from high dose effects to predict adverse health effects from low dose human contact.	**Moderate**	**Over/under-estimate**	**Many toxicity data developed from studies involving 100 percent exposure to chemical.**
Use of dose-response data from short-term studies to predict the effects of long-term exposure and vice-versa.	**Moderate**	**Over/under-estimation**	**Effects produced from studies of different durations are not necessarily consistent.**
Use of dose-response data from animal studies to predict human effects.	**High**	**Over/under-estimation**	**The effect of a chemical on a human population may not be equivalent to the effect on the tested animal population.**
Use of dose-response data for homogenous populations to predict general population effects.	**High**	**Over/under-estimation**	**Depends on the sensitivity of the exposure population in comparison with the homogenous population**
Use of equivalency factors to establish slope factors for the carcinogenic PAHs.	**Low**	**Over/under-estimation**	**Relating the toxicity of the carcinogenic PAHs to the carcinogenicity of benzo(a)pyrene may not accurately predict associated toxicity.**
Risk Characterization			
Excluding selected exposure pathways from consideration.	**Low**	**Underestimate**	**All realistic exposure pathways were included in the baseline risk assessment.**
Additivity of risks.	**Moderate**	**Over/under-estimate**	**Assumption ignores possible synergism or antagonism among chemicals, and the differences in the mechanisms of action and metabolism.**
Assumption that there is no dermal risk associated with the carcinogenic PAHs.	**Moderate**	**Underestimate**	**Because PAHs cause cancer through direct action at the point of application, this type of carcinogen is not included in the quantitative dermal carcinogenic risk assessment.**
Intake assumptions.	**Moderate**	**Over/under-estimate**	**Actual affect of uncertainty depends on site activity and surrounding land use.**

Uncertainty Parameter	Degree of Impact	Impact Affect to Risk	Sensitivity/Range of Uncertainty
Excluding selected chemicals detected in site media (the risks associated with recreational use and subsistence fishing exposure to Calcasieu River surface water were presented without considering thallium).	**Low**	**Underestimate**	**RfDs associated with thallium compounds are $8x10^{-5}$ and $9x10^{-5}$ mg/kg-day. A value of $8x10^{-5}$ mg/kg-day was presented in the *Toxicity Assessment Memorandum* (Black & Veatch 1998b). Using this RfD, the calculated HI was determined to be an unreasonably high value of 14,700. The Region III Risk-Based Concentration Table (EPA 1997b) stated that the values for elemental thallium are provisional (only a soil screening level of 0.4 mg/kg is presented). The IRIS database provides no values or documentation for elemental thallium. Thallium was not detected in river sediment, and is not a metal typically associated with MGP sites. Not including thallium in the risk characterization may underestimate the overall risk associated with surface water; however, including the analyte overestimates the risk contribution associated with the MGP site.**
Lack of toxicity data for all detected chemicals, including acenaphthylene, benzo(g,h,i)perylene, isopropylbenzene, lead, magnesium, phenanthrene, sec-butylbenzene, sodium, tert-butylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.	**Low to Moderate**	**Underestimate**	**Many of these chemicals were detected at low concentrations. However, because no data are available, these chemicals have not impact on the overall site risk. Lead was eliminated from consideration on the basis of comparison with screening levels.**

APPENDIX G
ARARS AND POTENTIAL ARARS

Table 1
Federal, State and Local Laws Deemed Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
Federal Chemical-Specific ARARs			
Safe Drinking Water Act [40 United States Code (USC) Section 300]			
National Primary Drinking Water Standards [40 Code of Federal Regulations (CFR) Part 141]	**Establish health-based standards for public water systems (maximum contaminant levels or MCLs).**	**As part of the baseline risk assessment, it was assumed that the ground water monitored on site would not be used as a public water supply, but as a private water supply for facility workers.**	**Alternatives 2,3,4,5 and 6.**
Maximum Contaminant Level Goals (Public Law No. 99-339, 100 Statute 642, 1986)	**Establish drinking water quality goals set at levels of known or anticipated adverse health effects, with an adequate margin of safety.**	**As part of the baseline risk assessment, it was assumed that the ground water monitored on site would not be used as a public water supply, but as a private water supply for facility workers.**	**Alternatives 2,3,4,5 and 6.**
Clean Water Act (33 USC Section 1251-1376)			
Water Quality Criteria (40 CFR Part 131)	**Sets criteria for ambient water quality on the basis of toxicity to aquatic organisms and human health.**	**If ground water is discharged to the Calcasieu River, these criteria would be applicable.**	**Alternatives 2,3,4,5 and 6.**
EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR Part 136)	**Establish EPA regulations on test procedures for the analysis of pollutants**	**Residuals generated during the treatment of contaminated ground water may be classified as a hazardous waste, if they exhibit any RCRA characteristics.**	**Alternatives 2,3,4,5 and 6.**
Federal Chemical- and Action-Specific ARARs			
Clean Water Act (33 USC Section 1251-1376)			
National Pretreatment Standards (40 CFR Part 403)	**Set standards to control pollutants that pass through or interfere with treatment processes in publicly owned treatment works (POTW).**	**If contaminated ground water is treated at the Lake Charles wastewater treatment plant, these standards would be applicable.**	**Alternatives 3,4,and 5.**

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
Resource Conservation and Recovery Act (RCRA) (42 USC 6905, 6912, 6924, 6925)			
Identification and Listing of Hazardous Waste (40 CFR Part 261)	**Defines those solid wastes that are subject to regulation as hazardous waste under 40 CFR Parts 262-265 and Parts 124, 270, and 271.**	**Residuals generated during the treatment of contaminated ground water may be classified as a hazardous waste, if they exhibit any RCRA characteristics.**	**Alternatives 2,3,4,5 and 6.**
Federal Location-Specific ARARs			
Wetlands Executive Order (EO 11990)	**Requirement that federal agencies minimize the destruction, loss, or degradation of wetlands and preserve and enhance natural and beneficial values of wetlands.**	**A cypress wetland is west of the site. If implemented, ground water pumping may have an impact on water levels in the cypress wetland.**	**Alternatives 3,4,and 5.**
Federal Chemical-Specific TBCs			
EPA OSWER Directive 9355.02	**MCLs for ground water contaminants.**	**As part of the baseline risk assessment, it was assumed that the ground water monitored on site would not be used as a public water supply, but as a private water supply for facility workers.**	**Alternatives 2,3,4,5 and 6.**
State of Louisiana Location-Specific ARARs			
Louisiana Natural Resources Regulations (Title 43)	**Provides rules and regulations for protecting Louisiana's natural resources, including coastal public land.**	**Ground water remedial actions will need to be conducted to prevent degradation of the natural resources in the area (e.g, Calcasieu River).**	**Alternatives 2,3,4,5 and 6.**

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
State of Louisiana Chemical-, Location- and Action-Specific ARARs			
Water Quality Regulations (Title 33, Part IX, Chapters 1-21)	**Establish effluent limitations for wastewater discharges and water quality standards. Set designated uses for state water bodies, including the Calcasieu River, and numerical criteria based on the use of the water body. Establish regulations regarding the discharge of wastes into state water bodies and the protection of state water quality.**	**Contaminated ground water may be discharged to the Calcasieu River. In the site area, the designated use of the Calcasieu River is for primary and secondary contact recreation and the propagation of fish and wildlife. This section of the river is not considered an outstanding natural resource; however, areas upstream of the site have this designation.**	**Alternatives 2,3,4,5 and 6.**
State of Louisiana Action-Specific ARARs			
Louisiana Civil Code Article 2520 § 2039, Recordation of Notice of Solid or Hazardous Waste Site by Landowner	**Requires a landowner who has actual or constructive knowledge that his property has been used for disposal of hazardous waste or as a solid waste landfill, to cause notice of the identification of the location of the waste site to be recorded in the mortgage and conveyance records of the parish in which the property is located.**	**Remedial actions may require notice of ground water use restrictions be placed in the property records.**	**Alternatives 2,3, and 6.**
City of Lake Charles Chemical-Specific TBCs			
City of Lake Charles, Louisiana Wastewater Treatment Operations	**Establishes limitations on the amount and types of contaminants in water being discharged to the Publicly Owned Treatment Works (POTW).**	**The City may require establishing a pretreatment agreement for treatment and discharge of ground water to the POTW.**	**Alternatives 3,4,and 5.**

Table 2
Federal, State and Local Laws Deemed Potentially Applicable or Relevant and Appropriate Requirements (ARARs)

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
Federal Chemical-Specific Potential ARARs			
Safe Drinking Water Act [40 United States Code (USC) Section 300]			
National Secondary Drinking Water Standards (40 CFR Part 143)	**Establish welfare-based standards for public water systems (secondary maximum contaminant levels).**	**As part of the baseline risk assessment, it was assumed that the ground water monitored on site would not be used as a public water supply, but as a private water supply for facility workers.**	**Alternatives 2,3,4,5 and 6**
Clean Air Act (42 USC Section 7401-7642)			
National Primary and Secondary Ambient Air Quality Standards (40 CFR Part 50)	**Establish standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).**	**If air emissions occurred during ground water extraction or treatment, these standards would be applicable. However, based on the ground water contaminant concentrations, contaminant emissions are expected to be minimal.**	**Alternatives 2,3,4,5 and 6**
EPA Regulations on National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61)	**Establish emission standards for specific hazardous contaminants at stationary facilities.**	**If air emissions occurred during ground water extraction or treatment, these standards would be applicable. However, based on the ground water contaminant concentrations, contaminant emissions are expected to be minimal.**	**Alternatives 2,3,4,5 and 6**
Resource Conservation and Recovery Act (RCRA) (42 USC 6905, 6912, 6924, 6925)			
RCRA Ground Water Protection (40 CFR Part 264)	**Provides for ground water protection standards, general monitoring requirements, and technical requirements.**	**Remedial actions may involve the treatment of ground water. If RCRA hazardous waste is generated, then these ground water protection requirements would apply.**	**Alternatives 2,3,4,5 and 6**
RCRA Solid Waste Disposal Facility Requirements (40 CFR Part 257.3-4)	**Provide for protection of ground water at solid waste disposal facilities.**	**Would be indirectly applicable to landfills receiving solid waste (e.g., ground water treatment residuals) from the site.**	**Alternatives 2,3,4,5 and 6**

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
Federal Chemical- and Action-Specific Potential ARARs			
Clean Water Act (33 USC Section 1251-1376)			
EPA Regulations on Criteria and Standards for NPDES (40 CFR Parts 122 and 125)	**Establish treatment requirements, permit issuance guidelines, compliance variances, and alternative effluent limitations.**	**If remedy changes occur which would allow for direct discharge of waste water into the Calcasieu River, these standards would be applicable.**	**Alternatives 2,3,4,5 and 6**
Resource Conservation and Recovery Act (RCRA) (42 USC 6905, 6912, 6924, 6925)			
Land Disposal Restrictions (40 CFR Part 268)	**Establish a timetable for restriction of burial of wastes and other hazardous materials.**	**If any residuals generated during the treatment of contaminated ground water exhibit Resource Conservation and Recovery Act (RCRA) characteristics, these restrictions would be applicable for land disposal.**	**Alternatives 2,3,4,5 and 6**
Federal Action-Specific Potential ARARs			
Resource Conservation and Recovery Act of 1976 (42 USC Sections 6901-6987)			
Criteria for Classification of Solid Waste Disposal Facilities and Practices (40 CFR Part 257)	**Establish criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health, and thereby constitute prohibited open dumps.**	**Would be applicable to facilities receiving solid wastes (e.g., treatment residuals) from the site.**	**Alternatives 2,3,4,5 and 6**
Hazardous Waste Management Systems-General (40 CFR Part 260)	**Establish procedures and criteria for modification or revocation of any provision in 40 CFR Parts 260-265 and 268**	**Residuals generated during the treatment of contaminated ground water may be classified as a hazardous waste, if they exhibit any RCRA characteristics. However, based on the low levels of ground water contaminants, it is unlikely that residuals would exhibit RCRA characteristics.**	**Alternatives 2,3,4,5 and 6**

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262)	**Establish standards for generators of hazardous waste.**	**Residuals generated during the treatment of contaminated ground water may be classified as a hazardous waste, if they exhibit any RCRA characteristics. However, based on the low levels of ground water contaminants, it is unlikely that residuals would exhibit RCRA characteristics.**	**Alternatives 2,3,4,5 and 6**
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 264)	**Establish minimum national standards that define the acceptable management of hazardous waste for owners and operators of facilities that treat, store, or dispose of hazardous waste.**	**Would be applicable to facilities receiving hazardous waste from the site. However, based on the low levels of ground water contaminants, it is unlikely that residuals would exhibit RCRA characteristics.**	**Alternatives 2,3,4,5 and 6**
Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 265)	**Establish minimum national standards that define the acceptable management of hazardous waste during the period of interim status and until certification of final closure or, if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.**	**Would be applicable to facilities receiving hazardous waste from the site. However, based on the low levels of ground water contaminants, it is unlikely that residuals would exhibit RCRA characteristics.**	**Alternatives 2,3,4,5 and 6**
Hazardous Waste Permit Program (40 CFR Part 270)	**Establish provisions covering basis of EPA permitting requirements.**	**Would be applicable for any remedial action involving the disposal of hazardous materials (e.g., treatment residuals). However, onsite treatment would not require a RCRA permit. However, based on the low levels of ground water contaminants, it is unlikely that residuals would exhibit RCRA characteristics.**	**Alternatives 2,3,4,5 and 6**
Clean Air Act (42 USC Sections 7401-7642)			

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
National Ambient Air Quality Standards (40 CFR 50, 53, and 61)	Set treatment technology standards for emissions to air from incinerators, surface impoundments, waste piles, landfills, and fugitive emissions.	If air emissions occurred during ground water extraction or treatment, these standards would be applicable. However, based on the ground water contaminant concentrations, contaminant emissions are expected to be minimal.	Alternatives 3 and 4
Hazardous Materials Transportation Act (49 USC Sections 1801-1813)			
Hazardous Materials Transportation Regulations (49 CFR Parts 107, 171-177)	Regulate transportation of hazardous materials.	Would be applicable to any ground water remedial actions involving the transportation of hazardous materials (e.g., treatment residuals). However, based on the low level of ground water contaminants, it is not likely that residuals would exhibit RCRA characteristics.	Alternatives 2,3,4,5 and 6
Federal Location-Specific Potential ARARs			
Fish and Wildlife Coordination Act (16 USC Section 661-666)	Requires consultation when a federal department or agency proposes or authorizes any modification of any stream or other body of water and adequate provision for protection of fish and wildlife resources.	If contaminants were to migrate to surface water, then a consultation would have to occur if the surface water was impacted by the contaminants.	Alternatives 2,3,4,5 and 6
National Environmental Policy Act (40 CFR Part 6)	Policy for carrying out provisions of the Wetlands/Flood Plains Management Executive Order.	A cypress wetland is west of the site, and the site is within the 100-year flood plain. If implemented, ground water pumping may have an impact on water levels in the cypress wetland.	Alternatives 4 and 5
State of Louisiana Chemical-Specific Potential ARARs			

Standard, Requirement, Criteria, or Limitation	Description	Comment	Alternative
Louisiana Air Regulations (Title 33, Part III, Chapters 7, 9,13, 21, 29, and 31)	**Establish standards for protecting ambient air quality, general emissions, particulate matter, organic compounds, and odor.**	**If air emissions occurred during ground water extraction or treatment, these standards would be applicable. However, based on the ground water contaminant concentrations, contaminant emissions are expected to be minimal.**	**Alternatives 2,3,4,5 and 6**
Louisiana Hazardous Waste and Hazardous Materials Regulations (Title 33, Part V, Chapters 17, 22, and 49)	**Establish air emission standards for hazardous waste facilities, as well as identifying prohibitions on land disposal and lists of hazardous wastes.**	**Remedial actions may involve emissions of contaminants and disposal of hazardous waste in landfills.**	**Alternatives 2,3,4,5 and 6**
State of Louisiana Action-Specific Potential ARARs			
Louisiana Air Regulations (Title 30, Part III, Chapters 1-64)	**Establish regulations and standards for the emission of air pollutants and odors, incinerators, and air pollution prevention.**	**If air emissions occurred during ground water extraction or treatment, these standards would be applicable. However, based on the ground water contaminant concentrations, contaminant emissions are expected to be minimal.**	**Alternatives 2,3,4,5 and 6**
Louisiana Hazardous Waste and Hazardous Materials Regulations (Title 33, Part V, Chapters 1-101)	**Establish rules regarding the generation, transportation, treatment, disposal, and storage of hazardous waste and materials, including waste burned in boilers, industrial furnaces, and incinerators.**	**Would be applicable to ground water remedial actions involving the transportation, disposal, or treatment of treatment residuals classified as a hazardous waste. However, based on the low level of ground water contaminants, it is not likely that residuals would exhibit RCRA characteristics.**	**Alternatives 2,3,4,5 and 6**

APPENDIX H
SUMMARY OF COSTS FOR SELECTED REMEDY

Cost Estimate for the Selected Ground Water Remedy Ground Water Operable Unit				
Description of Capital Costs	**Units**	**Unit Cost**	**Quantity**	**Total Cost**
Ground Water Use Restrictions[(1)]	**LS**	**$14,500**	**1**	**$14,500**
CONSTRUCTION SUBTOTAL				**$14,500**
Bid Contingencies (15%)				**$2,200**
Scope Contingencies (15%)				**$2,200**
CONSTRUCTION TOTAL				**$18,900**
Permitting and Legal (5%)				**$900**
Construction Services (10%)				**$1,900**
TOTAL IMPLEMENTATION COST				**$21,700**
Engineering Design (8%)				**$1,700**
TOTAL CAPITAL COST				**$23,400**
Description of Operation & Maintenance Costs	**Units**	**Unit Cost**	**Quantity**	**Total Cost**
Sample Analyses and Data Management for 11 Monitoring Wells[(2)]	**LS**	**$16,000**	**Quarterly/Years 1-3**	**$192,000**
			Annually/Years 4-10	**$96,000**
			Annually/Years 15, 20, 25, 30	**$64,000**
Sample Analyses and Data Management for 5 Surface Water and 6 Public Water Supply Wells[(2)]	**LS**	**$6,000**	**Annually/Years 1-10**	**$60,000**
			Annually/Years 15, 20, 25, 30	**$24,000**
Review of Ground Water Use Restrictions	**LS**	**$3,000**	**Annually/Years 1-10**	**$30,000**
			Annually/Years 15, 20, 25, 30	**$12,000**
Five Year Review	**Year**	**$50,000**	**6**	**$300,000**
Maintenance	**Year**	**$500**	**30**	**$15,000**
Total O&M Costs				**$793,000**
Summary of Cost Estimate				
Total Costs[(3)]				**$816,400**

Cost Estimate for the Selected Ground Water Remedy Ground Water Operable Unit	
Total Present Worth Costs[4]	**$553,571**

Notes:
(1) Costs are legal and support fees to implement the deed restrictions, attend meetings, and perform other coordination activities. Assumed that only the site property would require deed restrictions.
(2) Ground water and surface water samples would be collected for VOCs, PAHs, arsenic and barium analyses. Costs include travel, sample collection, laboratory analysis, data validation, and report preparation.
(3) Capital Cost estimates are not discounted because the construction work will be performed in the first year.
(4) Present worth estimates use a 5% discount rate for a 30 year duration.

Cost estimates are within +50% to -30% accuracy expectation.

LS = Lump Sum

APPENDIX I
LDEQ CONCURRENCE LETTER

State of Louisiana

Department of Environmental Quality

M.J. "MIKE" FOSTER, JR.
GOVERNOR

J. DALE GIVENS
SECRETARY

August 21, 2000

Ms. Caroline Ziegler (6SF-LL)
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Record of Decision (ROD) concurrence letter
Gulf States Utilities - North Ryan Street AI No. 293
Ground Water Operable Unit Number 1 (OU #1)
303 North Ryan Street, Lake Charles, Calcasieu Parish

Dear Ms. Ziegler:

Employees of the Louisiana Department of Environmental Quality-Remediation Services Division (LDEQ-RSD) have reviewed the above referenced document received August 9, 2000.

The selected remedy components in the ROD are:

- Monitored natural attenuation of groundwater which includes sampling groundwater wells which are completed in the sufficial aquifer to confirm that a decrease in contamination is occurring;
- Monitoring surface water and drinking water supply wells to assure that contaminants do not exceed any regulatory or health based risk levels;
- Institutional controls which require that Entergy Gulf States, Inc. file a notice of groundwater use restrictions and place them in the property records for this service center property to prevent human exposure to contaminated groundwater; and
- As long as regulatory standards are being exceeded, long-term operation and maintenance.

Caroline Ziegler/ August 21, 2000

LDEQ concurs with the EPA regarding the decision of the Selected Remedy in ROD, and that it will protect the public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

If you have any questions or require any additional information, please feel free to contact me at (225) 765-0487.

Sincerely,

Rich Johnson
Environmental Scientist
Remediation

rpj

APPENDIX J
ADMINISTRATIVE RECORD INDEX

Prepared for

United States Environmental Protection Agency

Region 6

Administrative Record Index

for

NORTH RYAN STREET UTILITIES YARD SUPERFUND SITE GROUND WATER OPERABLE UNIT 1

REMEDIAL ACTION

EPA ID No. LAD 985169317

ESS II
Task Order No. 083-004

Caroline Ziegler
Remedial Project Manager
U.S. EPA Region 6

Prepared by

TechLaw, Inc.
750 N. St. Paul Street, Suite 600
Dallas, Texas 75201

June 9, 2000

INTRODUCTION

The purpose of this document is to provide the public with an index to the Administrative Record (AR) for the U.S. Environmental Protection Agency (EPA) remedial action to respond to conditions at the North Ryan Street Utilities Yard (aka Gulf States Utilities) site (the "Site") Operable Unit 1. The EPA's remedial action is authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Section 9601 et seq. Comments regarding this response action, including this record, should be addressed to:

Caroline A. Ziegler
Remedial Project Manager
U.S. EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-2178

Section 113(j)(1) of CERCLA, 42 U.S.C. Section 9613(j)(1), provides that judicial review of the adequacy of a CERCLA response action shall be limited to the AR. Section 113(k)(1) of CERCLA, 42 U.S.C. Section 9613(k)(1), requires the EPA to establish an AR upon which it shall base the selection of its remedial actions. As the EPA decides what to do at the site of a release of hazardous substances, it compiles documents concerning the site and its decision into an "AR file." This means that documents may be added to the AR file from time to time. After the EPA Regional Administrator or the Administrator's delegate signs the Action Memorandum or the Record of Decision memorializing the selection of the remedial action, the documents which form the basis for the selection of the remedial action are then known as the Administrative Record (AR).

Section 113(k)(1) of CERCLA requires the EPA to make the AR available to the public at or near the site of the remedial action. Accordingly, the EPA has established a repository where the record may be reviewed near the Site at:

Central Calcasieu Parish Library
301 West Claude Street
Lake Charles, Louisiana 70605
(318) 475-8792

The public also may review the AR at the EPA Region 6 offices in Dallas, Texas, by contacting the Administrative Record Coordinator at the address listed above. The AR file is available for public review during normal business hours. The AR file is treated as a non-circulating reference document. Any document in the AR file may be photocopied according to the procedures used at the repository or at the EPA Region 6 office. This index and the AR file were compiled in accordance with the EPA's Final Guidance on Administrative Records for Selecting CERCLA Response Actions, Office of Solid Waste and Emergency Response (OSWER) Directive Number 9833.3A-1 (December 3, 1990), and in accordance with Superfund Removal Procedures Public Participation Guidance for On-Scene Coordinators: Community Relations and the Administrative Record, OSWER 9360.3-05 (July 1992).

Documents listed as bibliographic sources for other documents in the AR file might not be listed separately in the index. When a document is listed in the index but not located among the documents which the EPA has made available in the repository, the EPA may, upon request, include the document in the repository or make it available for review at an alternate location. This applies to documents such as verified sampling data, chain of custody forms, guidance and policy documents, as well as voluminous site-specific reports. It does not apply to documents in the EPA's confidential file. Copies of guidance documents also can be obtained by calling the RCRA/Superfund/Title 3 Hotline at (800) 424-9346. Requests for documents listed in the index but not present at the repository should be addressed to:

Caroline A. Ziegler
Remedial Project Manager
U.S. EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-2178

The EPA response selection guidance compendium index has not been updated since March 22, 1991 (see CERCLA Administrative Records: First Update of the Compendium of Documents Used for Selecting CERCLA Response Actions [March 22, 1991]); accordingly, it is not included here. Moreover, based on resource considerations, the Region 6 Superfund Division Director has decided not to maintain a Region 6 compendium of response selection guidance. Instead, consistent with 40 CFR Section 300.805(a)(2) and 300.810(a)(2) and OSWER Directive No. 9833.3A-1, (page 37), the AR Index includes listings of all guidance documents which may form a basis for the selection of the response action in question.

The AR file is compiled as documents related to the response action are generated. All documents that are clearly relevant and non-privileged are placed in the AR file, entered into the index, and made available to the public. The documents included in the index are arranged predominantly in chronological order. The EPA may send supplemental AR file volumes and indexes to the designated repository. These supplements should be placed with the initial AR file. The AR Index helps locate and retrieve documents in the file. It also provides an overview of the response action history. The index includes the following information for each document:

- **Bates** - The sequential numbers stamped on each page of the AR.
- **Date** - The date the document was published and/or released. "01/01/3333" means no date was recorded.
- **Pages** - Total number of printed pages in the document, including attachments.
- **Title** - Descriptive heading.
- **Doc Type** - General identification, (e.g., correspondence, Remedial Investigation Report, Record of Decision.)
- **Author** - Name and title of originator, and the name of the organization that the author is affiliated with.
- **Recipient** - Name, title, and affiliation of the recipient.

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004460

Bates: From: 000001 To: 000094
Date: 02/01/1989
Pages: 94
Title PHASE I EVALUATION REPORT AND PHASE II DRILLING AND SAMPLING PLAN
Doc Type: REPORT/STUDY

Author(s):

Name: CARRIERE, JANE M
Organization: WALK HAYDEL & ASSOCIATES INC.
JobTitle: N/A

Name: FAIR, GERALD E
Organization: WALK HAYDEL & ASSOCIATES INC.
JobTitle: PROFESSIONAL ENGINEER

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 000095 To: 000185
Date: 07/01/1989
Pages: 91
Title PHASE II EVALUATION REPORT
Doc Type: REPORT/STUDY

Author(s):

Name: FAIR, GERALD E
Organization: WALK HAYDEL & ASSOCIATES INC.
JobTitle: PROFESSIONAL ENGINEER

Name: FORTIER, JANE C
Organization: WALK HAYDEL & ASSOCIATES INC.
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004461

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 000186 To: 000445
Date: 10/01/1990
Pages: 260
Title PHASE III EVALUATION REPORT
Doc Type: REPORT/STUDY

Author(s):

Name: FORTIER, JANE C
Organization: WALK HAYDEL & ASSOCIATES INC.
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 000446 To: 000447
Date: 10/01/1990
Pages: 2
Title AN EPA UPDATE ON ACTIVITIES AT THE NORTH RYAN STREET UTILITY YARD
Doc Type: FACTSHEET

Author(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

Recipient(s):

Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004462

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 000448 To: 000449
Date: 11/15/1991
Pages: 2
Title REQUEST FOR MEETING TO DISCUSS FOUR PROPOSED SUPERFUND SITES IN LOUISIANA AND ARKANSAS
Doc Type: CORRESPONDENCE

Author(s):

Name: GRISWOLD, ROBERT M
Organization: U S EPA
JobTitle: REMEDIAL PROJECT MANAGER
Department(s)
REGION 6

Recipient(s):

Name: LINDSAY, JOHN A
Organization: U S EPA
JobTitle: N/A
Department(s)
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WASTE MANAGEMENT DIVISION
Location(s)
ATLANTA, GEORGIA

Bates: From: 000450 To: 000526
Date: 09/24/1992
Pages: 77
Title SCREENING SITE INSPECTION REPORT OF GULF STATES UTILITIES/NORTH RYAN STREET, LAKE CHARLES, CALCASEIU PARISH, LOUISIANA CERCLIS NO. LAD985169317
Doc Type: REPORT/STUDY

Author(s):

Name: COWAN, STEVE
Organization: ICF TECHNOLOGY INCORPORATED
JobTitle: TASK MANAGER

Recipient(s):

Name: BENNETT, STACEY
Organization: U S EPA
JobTitle: WORK ASSIGNMENT MANAGER
Department(s)
REGION 6

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004463

Bates: 000527
Date: 02/01/1995
Pages: 1
Title NATIONAL PRIORITIES LIST, GULF STATES UTILITIES-NORTH RYAN STREET, LAKE CHARLES, LOUISIANA
Doc Type: NOTICE

Author(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A

Department(s)
HAZARDOUS SITE EVALUATION DIVISION
OFFICE OF EMERGENCY RESPONSE AND REMOVAL

Recipient(s):

Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Bates: **From:** 000528 **To:** 000529
Date: 02/13/1995
Pages: 2
Title GULF STATES UTILITIES (NORTH RYAN) / UTILITIES YARD - SITE PROPOSED TO NATIONAL PRIORITIES LIST
Doc Type: NOTICE

Author(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A

Department(s)
REGION 6

Recipient(s):

Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004464

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 000530 To: 000593
Date: 02/13/1996
Pages: 64
Title PUBLIC HEALTH ASSESSMENT FOR NORTH RYAN STREET UTILITIES YARD - LAKE CHARLES, CALCASIEU PARISH, LOUISIANA - CERCLIS NO. LAD985169317 - FEBRUARY 13, 1996
Doc Type: HEALTH ASSESSMENT

Author(s):

Name: N/A,
Organization: U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
JobTitle: N/A
Department(s)
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 000594 To: 000703
Date: 01/11/1997
Pages: 110
Title SITE HEALTH AND SAFETY PROGRAM - LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):

Name: HIRNER, CARY
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

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FILE 6/9/2000

REMEDIAL

004465

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 000704 To: 000861
Date: 02/01/1997
Pages: 158
Title FINAL ENGINEERING EVALUATION/COST ANALYSIS AND REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
Doc Type: WORKPLAN/AMENDMENT

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY SERVICES, INC
JobTitle: N/A

Bates: From: 000862 To: 001081
Date: 02/01/1997
Pages: 220
Title FINAL SAMPLING AND ANALYSIS PLAN - NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: SAMPLING AND ANALYSIS

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY SERVICES, INC
JobTitle: N/A

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004466

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 001082 To: 001174
Date: 02/24/1997
Pages: 93
Title ADMINISTRATIVE ORDER ON CONSENT FOR THE NORTH RYAN STREET SUPERFUND SITE
Doc Type: ADMINISTRATIVE ORDER (AOC)

Author(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 001175 To: 001176
Date: 05/05/1997
Pages: 2
Title NOTICE OF PROPOSED ADMINISTRATIVE ORDER ON CONSENT PURSUANT TO CERCLA
Doc Type: NOTICE

Author(s):
Name: N/A,
Organization: FEDERAL REGISTER
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004467

Bates: From: 001177 To: 001180
Date: 12/29/1997
Pages: 4
Title REQUEST FOR AMENDMENT TO IAG DW 13936229-01, DEPARTMENT OF COMMERCE (NOAA), TITLE: TECHNICAL SUPPORT FOR CERCLA ACTIVITIES, TO INCLUDE WORK PERFORMED AT THE NORTH RYAN STREET UTILITIES YARD SUPERFUND SITE (Z6)
Doc Type: CORRESPONDENCE

Author(s):

Name: MASSEY, JOE C
Organization: U S EPA
JobTitle: SUPERFUND STATE COORDINATOR
Department(s)
LOUISIANA REGION

Recipient(s):

Name: ALEXANDER, LUCILLE
Organization: U S EPA
JobTitle: N/A
Department(s)
EMERGENCY RESPONSE TEAM

Bates: From: 001181 To: 001200
Date: 02/01/1998
Pages: 20
Title ADDENDUM NO. 1 TO THE ENGINEERING EVALUATION/COST ANALYSIS AND REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004468

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 001201 To: 001566
Date: 06/01/1998
Pages: 366
Title VOLUME 1 REMEDIAL INVESTIGATION AND ENGINEERING EVALUATION/COST ANALYSIS INVESTIGATION REPORT (MAIN TEXT AND APPENDICES A-F)
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 001567 To: 002061
Date: 06/01/1998
Pages: 495
Title VOLUME II REMEDIAL INVESTIGATION AND ENGINEERING EVALUATION/COST ANALYSIS INVESTIGATION REPORT (APPENDICES G AND H)
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004469

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercllis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 002062 To: 002573
Date: 06/01/1998
Pages: 512
Title VOLUME III REMEDIAL INVESTIGATION AND ENGINEERING EVALUATION/COST ANALYSIS INVESTIGATION REPORT (APPENDICES I AND J)
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 002574 To: 002604
Date: 10/01/1998
Pages: 31
Title ADDENDUM NO. 2 TO THE ENGINEERING EVALUATION/COST ANALYSIS AND REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 002605 To: 002643
Date: 11/01/1998
Pages: 39
Title COMMUNITY INVOLVEMENT PLAN - LAKE CHARLES/NORTH RYAN MANUFACTURED GAS PLANT SITE
Doc Type: COMMUNITY RELATIONS PLAN

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

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REMEDIAL

004470

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: 002644
Date: 12/16/1998
Pages: 1
Title REVIEW OF ENGINEERING EVALUATION/COST ANALYSIS AND RISK EVALUATION FOR NORTH RYAN STREET
Doc Type: CORRESPONDENCE

Author(s):

Name: MILLER, GLENN A
Organization: LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
JobTitle: ADMINISTRATOR

Recipient(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: REMEDIAL PROJECT MANAGER
Department(s)
REGION 6

Bates: **From:** 002645 **To:** 002717
Date: 01/01/1999
Pages: 73
Title 1998 GROUND WATER SAMPLING REPORT, NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

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REMEDIAL

004471

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 002718 To: 002740
Date: 01/19/1999
Pages: 23
Title SIGN-IN FORMS FOR THOSE WHO WISH TO MAKE COMMENTS AT THE PUBLIC MEETING REGARDING NORTH RYAN MGP/GULF STATES UTILITIES SITE.
Doc Type: PUBLIC COMMENT

Author(s):
Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 002741 To: 002854
Date: 01/19/1999
Pages: 114
Title PUBLIC MEETING ON RECOMMENDED ALTERNATIVES FOR THE LAKE CHARLES/NORTH RYAN MGP SITE
Doc Type: PUBLIC MEETING TRANSCRIPT

Author(s):
Name: NORTHCUTT, CARRIE C
Organization: LAKE CHARLES REPORTING SERVICE
JobTitle: CERTIFIED COURT REPORTER

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

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FILE 6/9/2000

REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercils: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004472

Bates: 002855
Date: 02/12/1999
Pages: 1
Title RECOMMENDED ALTERNATIVES FOR LAKE CHARLES/NORTH RYAN MGP SITE
Doc Type: CORRESPONDENCE

Author(s):
Name: MILLER, GLENN A
Organization: LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
JobTitle: ADMINISTRATOR

Recipient(s):
Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: REMEDIAL PROJECT MANAGER
Department(s)
REGION 6

Bates: **From:** 002856 **To:** 002981
Date: 03/01/1999
Pages: 126
Title ADDENDUM NO.1 TO THE REMEDIAL INVESTIGATION AND ENGINEERING EVALUATION/COST ANALYSIS INVESTIGATION REPORT
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

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REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004473

Bates: From: 002982 To: 003384
Date: 03/01/1999
Pages: 403
Title BASELINE RISK ASSESSMENT - NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 003385 To: 003607
Date: 04/01/1999
Pages: 223
Title FINAL ECOLOGICAL RISK ASSESSMENT, NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 003608 To: 003618
Date: 04/01/1999
Pages: 11
Title ADDENDUM NO.1 TO FINAL ECOLOGICAL RISK ASSESSMENT, NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

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REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004474

Bates: From: 003619 To: 003642
Date: 04/28/1999
Pages: 24
Title OPERABLE UNIT 1 FEASIBILITY STUDY SCREENING OF ALTERNATIVES
Doc Type: CORRESPONDENCE
REPORT/STUDY

Author(s):

Name: ENGLISH, DEBORAH A
Organization: BLACK & VEATCH
JobTitle: PROJECT MANAGER

Recipient(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: REGIONAL PROJECT MANAGER
Department(s)
REGION 6

Bates: 003643
Date: 05/20/1999
Pages: 1
Title REVIEW OF FINAL ECOLOGICAL RISK ASSESSMENT AND BASELINE RISK ASSESSMENT FOR NORTH RYAN STREET MANUFACTURED GAS PLANT SITE IN LAKE CHARLES, LOUISIANA
Doc Type: CORRESPONDENCE

Author(s):

Name: MILLER, GLENN A
Organization: STATE OF LOUISIANA
JobTitle: ADMINISTRATOR
Department(s)
DEPARTMENT OF ENVIRONMENTAL QUALITY

Recipient(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: REGIONAL PROJECT MANAGER
Department(s)
REGION 6

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FILE 6/9/2000

REMEDIAL

004475

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 003644 To: 003653
Date: 06/01/1999
Pages: 10
Title ADDENDUM NO. 3 TO THE ENGINEERING EVALUATION/COST ANALYSIS AND REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 003654 To: 003925
Date: 06/04/1999
Pages: 272
Title ACTION MEMORANDUM NORTH RYAN STREET SITE LAKE CHARLES, CALCASIEU PARISH, LOUISIANA
Doc Type: ACTION MEMORANDUM

Author(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: REMEDIAL PROJECT MANAGER
Department(s)
REGION 6

Recipient(s):

Name: KNUDSON, P.E., MYRON O
Organization: U S EPA
JobTitle: DIRECTOR
Department(s)
REGION 6
SUPERFUND DIVISION

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FILE 6/9/2000

REMEDIAL

004476

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 003926 To: 004162
Date: 10/01/1999
Pages: 237
Title OPERABLE UNIT 1 FEASIBILITY STUDY, NORTH RYAN STREET/ LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH CORPORATION
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 004163 To: 004260
Date: 10/25/1999
Pages: 98
Title LETTER TRANSMITTING ADMINISTRATIVE ORDER ON CONSENT BETWEEN ENTERGY GULF STATES, INC. "GSU" AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY "EPA" CONCERNING PERFORMANCE OF A REMOVAL ACTION AT THE NORTH RYAN STREET SITE, LAKE CHARLES, LOUISIANA (THE "SITE")
Doc Type: ADMINISTRATIVE ORDER (AOC)
CORRESPONDENCE

Author(s):

Name: WEISBERG, JONATHAN
Organization: U S EPA
JobTitle: SENIOR ATTORNEY
Department(s)
REGION 6

Name: KNUDSON, P.E., MYRON O
Organization: U S EPA
JobTitle: DIRECTOR
Department(s)
REGION 6
Location(s)
SUPERFUND DIVISION

Recipient(s):

Name: LEIFER, STEVEN L
Organization: BAKER & BOTTS
JobTitle: N/A

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REMEDIAL

004477

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 004261 To: 004316
Date: 01/01/2000
Pages: 56
Title 1999 GROUND WATER SAMPLING REPORT, NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH CORPORATION
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 004317 To: 004362
Date: 01/01/2000
Pages: 46
Title ADDENDUM NO. 2 TO THE REMEDIAL INVESTIGATION AND ENGINEERING EVALUATION/COST ANALYSIS INVESTIGATION REPORT
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH CORPORATION
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

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REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

004478

Bates: 004363
Date: 02/10/2000
Pages: 1
Title REVIEW COMPLETED OF THE REMOVAL ACTION WORK PLAN, SAMPLING AND ANALYSIS PLAN FOR THE NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE, DATED NOVEMBER 22, 1999
Doc Type: CORRESPONDENCE

Author(s):

Name: JOHNSON, RICH
Organization: LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
JobTitle: ENVIRONMENTAL SPECIALIST
Department(s)
REMEDIATION SERVICES DIVISION

Recipient(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: REMEDIAL PROJECT MANAGER
Department(s)
REGION 6

Bates: 004364
Date: 05/24/2000
Pages: 1
Title PROPOSED PLAN FOR GROUND WATER OPERABLE UNIT AND ARAR'S NORTH RYAN SITE/LAKE CHARLES MANUFACTURED GAS PLANT LAKE CHARLES, LOUISIANA CIFIS #293
Doc Type: CORRESPONDENCE

Author(s):

Name: CASANOVA, KEITH L
Organization: LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
JobTitle: ADMINISTRATOR
Department(s)
REMEDIATION SERVICES DIVISION

Recipient(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

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FILE 6/9/2000

REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercla: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: 004365
Date: 06/08/2000
Pages: 1
Title INVITATION TO THE U.S. EPA OPEN HOUSE FOR THE NORTH RYAN STREET SITE
Doc Type: NOTICE

Author(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

Recipient(s):

Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Bates: **From:** 004366 **To:** 004373
Date: 06/09/2000
Pages: 8
Title INVITATION TO COMMENT ON THE PROPOSED CLEANUP OF GROUND WATER AT THE NORTH RYAN STREET SUPERFUND SITE IN LAKE CHARLES, LOUISIANA
Doc Type: FACTSHEET

Author(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

Recipient(s):

Name: N/A,
Organization: PUBLIC
JobTitle: N/A

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FILE 6/9/2000

REMEDIAL

004480

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 004374 To: 004378
Date: 01/01/3333
Pages: 5
Title COMMENTS OF ENTERGY GULF STATES ON REMOVAL ACTIONS PROPOSED FOR THE NORTH RYAN STREET SITE, LAKE CHARLES, LOUISIANA
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 004379 To: 004383
Date: 01/01/3333
Pages: 5
Title THE CITIZEN GROUPS AND INDIVIDUALS CANNOT SUPPORT THE RECOMMENDATIONS SET FOR IN THE ENGINEERING EVALUATION/COST ANALYSIS.
Doc Type: REPORT/STUDY

Author(s):
Name: N/A,
Organization: N/A
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004481

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercils: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: 004384
Date: 01/01/3333
Pages: 1
Title THE SUPERFUND PROCESS - IDENTIFICATION, ASSESSMENT, NATIONAL PRIORITIES LIST PLACEMENT, INVESTIGATION, PREFERRED REMEDY AND FINAL REMEDY
Doc Type: FACTSHEET

Author(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A

Recipient(s):
Name: UNSPECIFIED,
Organization: N/A
JobTitle: N/A

Bates: From: 004385 To: 004421
Date: 01/01/3333
Pages: 37
Title E-MAILS AND WRITTEN COMMENTS FROM THE PUBLIC
Doc Type: E-MAIL MESSAGE

Author(s):
Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Administrative Record Index Report

FILE 6/9/2000

REMEDIAL

004482

Site Name: NORTH RYAN STREET UTILITIES YARD
Cercllis: LAD985169317
Ouid: OU1
Said: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): GROUNDWATER

Bates: From: 004422 To: 004456
Date: 01/01/3333
Pages: 35
Title CONCURRENCE LIST AND PROPOSED PLAN FOR THE GROUND WATER OPERABLE UNIT AT THE NORTH RYAN STREET SITE IN LAKE CHARLES, LOUISIANA
Doc Type: LIST
PROPOSAL

Author(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: PROJEC MANAGER
Department(s)
REGION 6

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 004457 To: 004482
Date: 06/09/2000
Pages: 26
Title FINAL ADMINISTRATIVE RECORD INDEX FOR NORTH RYAN STREET SUPERFUND SITE
Doc Type: OUTLINE

Author(s):

Name: N/A,
Organization: TECHLAW, INC
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

Prepared for

United States Environmental Protection Agency

Region 6

FINAL ADMINISTRATIVE RECORD INDEX

FOR

NORTH RYAN STREET UTILITIES YARD SUPERFUND SITE GROUND WATER OPERABLE UNIT 1

REMEDIAL ACTION ADDENDUM 1

EPA ID NO. LAD985169317

ESS II
Task Order No. 083-009

Caroline Ziegler
Remedial Project Manager
U.S. EPA Region 6

Prepared by

TechLaw, Incorporated
750 N St. Paul Street, Suite 600
Dallas, Texas 75201

October 30, 2000

PREAMBLE

The purpose of this document is to provide the public with an index to this combined Addendum and Final Administrative Record (AR) for a U.S. Environmental Protection Agency's (EPA) selected remedial action to respond to conditions at the North Ryan Street Utilities Yard Superfund site (the "Site"). EPA's remedial action is authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Section 9601 et seq.

Section 113 (j)(1) of CERCLA, 42 U.S.C. Section 9613 (j)(1), provides that judicial review of the adequacy of a CERCLA response action shall be limited to the AR. Section 113 (k)(1) of CERCLA, 42 U.S.C. Section 9613 (k)(1), requires the EPA to establish an AR upon which it shall base the selection of its remedial actions. As the EPA decides what to do at the Site of a release of hazardous substances, it compiles documents concerning the Site and the EPA's decision into an "AR file." This means that documents may be added to the AR file from time to time. Once the EPA Regional Administrator or the Administrator's delegate signs the Action Memorandum or the Record of Decision memorializing the selection of the action, the documents which form the basis for the selection of the response action are then known as the "AR."

Section 113(k)(1) of CERCLA requires the EPA to make the AR available to the public at or near the site of the response action. Accordingly, the EPA has established a repository where the record may be reviewed near the Site at:

Central Calcasieu Parish Library
301 West Claude Street
Lake Charles, Louisiana 70605
(318) 475-8792

The public may also review the AR at the EPA Region 6 offices in Dallas, Texas, by contacting the Remedial Project Manager at the address listed below. The record is available for public review during normal business hours. The record is treated as a non-circulating reference document. Any document in the record may be photocopied according to the procedures used at the repository or at the EPA Region 6 offices. This index and the record were compiled in accordance with the EPA's Final Guidance on Administrative Records for Selecting CERCLA Response Actions, Office of Solid Waste and Emergency Response (OSWER) Directive Number 9833.3A-1 (December 3, 1990), and in accordance with Superfund Removal Procedures Public Participation Guidance for On-Scene Coordinators: Community Relations and the Administrative Record, OSWER 9360.3-05 (July 1992).

Documents listed as bibliographic sources for other documents in the AR might not be listed separately in the Site index. Where a document is listed in the Site index but not located among the documents which EPA has made available in the repository, EPA will, upon request, include the document in the repository or make the document available for review at an alternate location. This applies to documents such as verified sampling data, chain of custody forms, guidance and policy

documents, as well as voluminous site-specific reports. Copies of guidance documents also can be obtained by calling the RCRA/Superfund/Title 3 Hotline at (800) 424-9346. It does not apply to documents in EPA's confidential file. These requests should be addressed to :

Caroline Ziegler
Remedial Project Manager
U.S. EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-2178

The EPA response-selection guidance compendium index has not been updated since March 22, 1991 (see CERCLA Administrative Records: First Update of the Compendium of Documents Used for Selecting CERCLA Response Actions [March 22, 1991]); accordingly, it is not included here. Moreover, based on resource considerations, the Region 6 Superfund Division Director has decided not to maintain a Region 6 compendium of response-selection guidance. Instead, consistent with 40 CFR Section 300.805(a)(2) and 300.810(a)(2) and OSWER Directive No. 9833.3A-1 at page 37, the AR Index includes listings of all guidance documents which may form a basis for the selection of the response action in question.

The documents included in the AR index are arranged predominantly in chronological order. The AR index helps locate and retrieve documents in the file. It also provides an overview of the response action history. The index includes the following information for each document:

- **Bates** - The sequential numbers stamped on each page of the AR.
- **Date** - The date the document was published and/or released.
- **Pages** - Total number of printed pages in the document, including attachments.
- **Title**
- **Doc Type** - General identification, (e.g. correspondence, Remedial Investigation Report, Record of Decision.)
- **Author** - Name and title of originator, and the name of the organization that the author is affiliated with.
- **Recipient** - Name, title, and affiliation of the recipient.

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FINAL 10/30/2000

REMEDIAL

004793

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): ADDENDUM 1

Bates: From: 004483 To: 004508
Date: 06/09/2000
Pages: 26
Title ADMINISTRATIVE RECORD INDEX FOR THE REMEDIAL ACTION, GROUNDWATER OPERABLE UNIT 1
Doc Type: OUTLINE

Author(s):

Name: N/A,
Organization: TECHLAW, INC
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 004509 To: 004581
Date: 01/07/1999
Pages: 73
Title 1998 GROUNDWATER SAMPLING REPORT - NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE.
Doc Type: REPORT/STUDY

Author(s):

Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

ADMINISTRATIVE RECORD INDEX

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REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): ADDENDUM 1

004794

Bates: From: 004582 To: 004638
Date: 01/01/2000
Pages: 57
Title 1999 GROUNDWATER SAMPLING REPORT - NORTH RYAN STREET/LAKE CHARLES MANUFACTURED GAS PLANT SITE.
Doc Type: REPORT/STUDY
Author(s):
Name: N/A,
Organization: BLACK & VEATCH
JobTitle: N/A

Recipient(s):
Name: N/A,
Organization: ENTERGY GULF STATES, INC
JobTitle: N/A

Bates: From: 004639 To: 004648
Date: 07/06/2000
Pages: 10
Title COMMENTS ON THE PROPOSED CLEANUP OF GROUND WATER AT THE NORTH RYAN STREET SUPERFUND SITE IN LAKE CHARLES, LOUISIANA
Doc Type: PUBLIC COMMENT
Author(s):
Name: LEIFER, STEVEN L
Organization: BAKER AND BOTTS
JobTitle: N/A

Name: ATHERTON, CHARLIE
Organization: CLEAN
JobTitle: N/A

Recipient(s):
Name: COATS, JANETTA
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

ADMINISTRATIVE RECORD INDEX

FINAL 10/30/2000

REMEDIAL

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): ADDENDUM 1

004795

Bates: From: 004649 To: 004663
Date: 07/06/2000
Pages: 15
Title PUBLIC HEARING ON THE NORTH RYAN STREET SUPERFUND SITE LAKE CHARLES, LOUISIANA
Doc Type: PUBLIC MEETING TRANSCRIPT

Author(s):

Name: MCLELLAN BECK, JACKIE
Organization: N/A
JobTitle: CERTIFIED COURT REPORTER

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES

Bates: From: 004664 To: 004665
Date: 08/21/2000
Pages: 2
Title RECORD OF DECISION (ROD) CONCURRENCE LETTER GULF STATES UTILITIES - NORTH RYAN STREET AI NO. 293 GROUND WATER OPERABLE UNIT NUMBER 1 (OU#1) 303 NORTH RYAN STREET, LAKE CHARLES, CALCASIEU PARISH
Doc Type: CORRESPONDENCE

Author(s):

Name: JOHNSON, RICH
Organization: LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
JobTitle: ENVIRONMENTAL SCIENTIST

Recipient(s):

Name: ZIEGLER, CAROLINE A
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6

ADMINISTRATIVE RECORD INDEX

FINAL 10/30/2000

REMEDIAL

004796

Site Name: NORTH RYAN STREET UTILITIES YARD
Cerclis: LAD985169317
Ouid: OU1
Ssid: (06Z6) - NORTH RYAN STREET UTILITIES YARD
Rec Type (Desc.): ADDENDUM 1

Bates: From: 004666 To: 004789
Date: 09/27/2000
Pages: 124
Title RECORD OF DECISION GULF STATES UTILITIES - NORTH RYAN STREET SITE, GROUND WATER OPERABLE UNIT, LAKE CHARLES, LOUISIANA
Doc Type: RECORD OF DECISION
Author(s):

Name: COOKE, GREGG A
Organization: U S EPA
JobTitle: REGIONAL ADMINISTRATOR
Department(s)
REGION 6

Recipient(s):

Name: N/A,
Organization: PUBLIC
JobTitle: N/A

Bates: From: 004790 To: 004796
Date: 10/30/2000
Pages: 7
Title ADDENDUM TO THE ADMINISTRATIVE RECORD FOR THE NORTH RYAN STREET UTILITIES YARD SUPERFUND SITE GROUND WATER OPERABLE UNIT
Doc Type: OUTLINE
Author(s):

Name: N/A,
Organization: TECHLAW, INC
JobTitle: N/A

Recipient(s):

Name: N/A,
Organization: U S EPA
JobTitle: N/A
Department(s)
REGION 6
Location(s)
SITE FILES