PROPOSED REMEDIAL ACTION DOCUMENT

VODA PETROLEUM, INC.
PROPOSED STATE SUPERFUND SITE
CLARKSVILLE CITY, GREGG COUNTY, TEXAS

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PREPARED BY: CAROL BOUCHER, P.G., PROJECT MANAGER
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
REMEDIATION DIVISION

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I. INTRODUCTION

Voda Petroleum, Inc., (aka Ultra Oil) (the Site) occupies 6.12 acres at 211 Duncan Road, approximately 1.25 miles west of the intersection of FM 2275 (George Richey Road) and FM 3272 (North White Oak Road), 2.6 miles north-northeast of Clarksville City in Gregg County (see Figure 1, Site Location). The Site was operated as a waste oil recycling facility from 1981 until it was abandoned in November 1991.

The Texas Commission on Environmental Quality (TCEQ) is an agency in the State of Texas that implements many of the state laws relating to the conservation of natural resources and the protection of public health and safety and the environment. The TCEQ addresses certain sites that may constitute an imminent and substantial endangerment to public health and safety or the environment through the state Superfund program.

II. PURPOSE

This *Proposed Remedial Action Document* (PRAD) presents the proposed *Remedial Action* (also known as the remedy) for the Site, which is designed to address the contamination and provide protection of public health and safety and the environment. Words appearing in italics in this document are defined in Section XI, "Glossary," of this PRAD.

The purpose of this document is:

- to describe the actions taken by the TCEQ to investigate the contamination, including any mitigating actions;
- to describe the proposed *Remedial Action*;
- to solicit public review and comment on the proposed *Remedial Action*; and
- to provide information on how the public can comment on the proposed *Remedial Action*.

This PRAD summarizes information that can be found in greater detail in various studies and reports located in the Site files. Relevant documents are identified and summarized in Part V, "Summary of Reports," of this PRAD.

The TCEQ encourages the public to review these documents to gain a better understanding of the Site, the state Superfund process, the actions taken by the TCEQ and the U.S. Environmental Protection Agency (EPA), and the actions proposed by the TCEQ to address the threats presented by the Site.

Copies of the documents summarized in this PRAD, as well as other relevant information, can be viewed at the local repository:

Longview Public Library
222 W. Cotton Street
Longview TX 75601
(903) 237-1350

or in Austin at the TCEQ Records Management Center:

Building E, 1st Floor
12100 Park 35 Circle
Austin, Texas 78753
(512) 239-2920

III. LEGAL AUTHORITY

The investigation of the nature and extent of contamination at the Site and the selection of the proposed *Remedial Action* is in accordance with the *Solid Waste Disposal Act* (codified as Chapter 361 of the Texas Health and Safety Code); Subchapter K: Hazardous Substance Facilities Assessment and Remediation rules found in Chapter 335 of 30 Texas Administrative Code (T.A.C.) (Subchapter K); and the *Texas Risk Reduction Program* (TRRP) rules found in Chapter 350 of 30 T.A.C.

While the Subchapter K rules are specific to the Superfund process, the TRRP rules are a comprehensive program for addressing environmental contamination and apply to many different types of corrective action administered by the TCEQ. The TRRP rules establish procedures for determining the concentration of contaminants to which a person or other environmental receptor can be exposed without unacceptable risk of harm. These acceptable concentration levels are called *Protective Concentration Levels* (PCLs).

A three-tiered approach may be used under the TRRP rules to calculate the PCLs for a site. The tiers represent increasing levels of evaluation where site-specific information is factored into the process. For example, Tier 1 uses conservative, generic models that do not account for site-specific factors, Tier 2 allows for the use of site-specific information, but must use PCL equations provided by the TCEQ, and Tier 3 allows for more detailed and complex evaluations so that PCLs are appropriate for specific site conditions. The PCLs for the Site were developed under Tier 1.

Critical to the analysis under all three of the tiers is the land use classification for the site. Under the TRRP rules, the land can be classified as either residential or commercial/industrial. Remediation to residential standards assumes that the site may be occupied by children and therefore is applicable not only to strictly residential land but also to playgrounds, schools, daycare centers and similar land uses. Remediation to commercial/industrial standards assumes that the site will not be regularly occupied by children and is protective of persons who may occupy the site as workers. Sites remediated to commercial/industrial standards cannot be used

for residential-type activities unless further controls are implemented to make the site safe for that use. The TCEQ determined that a commercial/industrial use was appropriate for the Site.

The TRRP rules allow risks posed by the presence of contamination above a PCL to be managed by any combination of the following: 1) removal or decontamination of contaminated media; 2) physical controls, such as landfills and caps, which limit exposure to the contaminated media; or *3) institutional controls*, such as deed restrictions on the future use of the property, which are also intended to limit exposure to the contaminated media. These remedies under the TRRP rules are divided into two main categories: Remedy Standard A and Remedy Standard B. To meet Remedy Standard A requirements, the contaminated media must be removed and/or decontaminated such that physical controls, and in most cases, *institutional controls* are not necessary to protect human and ecological receptors from unprotective levels of contamination based on the designated land use. To meet the requirements of Remedy Standard B, however, physical controls and *institutional controls* may be relied on to limit exposure to unprotective levels of contamination. These standards are described in detail in 30 T.A.C. §350.32 and §350.33. The proposed remedy at the Site meets the criteria established for Remedy Standard A.

IV. SITE HISTORY

Voda Petroleum, Inc., (aka Ultra Oil) was operated as a waste oil recycling facility from 1981 until it was abandoned in November 1991. The Site is located in a residential neighborhood with occupied residences directly on the east and west sides of the facility. A review of the facility waste management activity records revealed that Voda Petroleum, Inc., had received, stored and processed waste gasolines; oily wastes; used oil mixed with methyl ethyl ketone, varsol, trichloroethane, toluene, and hexane; crude oil; greases; and waxes. In 1996, the EPA conducted an emergency removal of 462 55-gallon drums of grease or oily wastes, 14 55-gallon drums of corrosive wastes, 16 above-ground tanks, and associated contaminated soil. The site was then backfilled to approximate the undisturbed topography to facilitate site drainage. The EPA response action removed the immediate threat to human health and the environment but was not intended to be and did not constitute a final remediation solution. Post removal analysis of soil and groundwater samples indicated that soil and groundwater continued to be contaminated above appropriate cleanup levels.

V. SUMMARY OF REPORTS

A. HAZARD RANKING SYSTEM REPORT

The *Hazard Ranking System* (HRS) is a numerically-based screening system that uses information from initial, limited investigations to assess whether a site qualifies for the state or federal Superfund program. Sites scoring 28.5 or greater may qualify for the federal Superfund program, while sites scoring 5 or greater may qualify for the state Superfund program. The HRS scoring for the Site was prepared by the TCEQ in August 1995 and is presented in the report titled "Hazard Ranking System (HRS) Documentation Record, Voda Petroleum Site, Gregg County, Texas." The Site earned a score of 23.63. The TCEQ proposed to list the Site on the State Registry of Superfund Sites and

published notice of its intent in the *Texas Register* on November 17, 2000 (25 TexReg 11594-11595).

B. REMEDIAL INVESTIGATION REPORT

The *Remedial Investigation* (RI) includes field work, laboratory analysis and interpretation of collected data for the purpose of determining the nature and extent of contamination associated with the Site. The Phase I RI Report, dated August 2002, includes a summary of the RI activities conducted at the site in May 2002. Based on the Phase I results, a second phase was conducted in April 2004, focusing on the area known as the "East Tank Farm." The Phase II RI Technical Memorandum (TM), dated July 2004, concluded that the investigation of the extent of soil contamination above cleanup standards was complete; however, additional groundwater monitor wells were needed to complete the groundwater investigation. Additional groundwater monitor wells were installed from April 2005 through May 2007. The final round of monitor well installations was found to fully define the extent of the groundwater contamination. The following is a summary of the findings of the RI:

Groundwater

The Site is located on the outcrop/recharge zone of the Queen City Aquifer. The Queen City formation consists of a fine to very fine sand grading to silty sand and is up to 400 feet thick in the Gregg County area. The Queen City aquifer has a sustained yield of 2.4 million gallons per day, with an estimated 8 million acre-feet available for use from storage (Ground-water Resources of Gregg and Upshur Counties, Texas, Broom, Matthew E., Texas Water Development Board, 1969.) Based on the information included in the Texas Water Development Board report, the groundwater at the Site is considered a Class 1 groundwater resource. Groundwater within the uppermost portion of the Queen City Aquifer at the site occurs from 7 to 21 feet below grade (fbg), with a slight gradient to the northeast. Several volatile organic constituents (VOCs) have been found in the shallow groundwater in excess of their drinking water standards. There are currently 19 monitor wells located at the site, 18 of which are completed from 10 to 30 fbg, and one, MW-15, completed from 40 to 50 fbg. The area of groundwater contamination is called the groundwater protective concentration limit exceedance (PCLE) zone. As shown on Figure 2, the PCLE zone extends 400 feet offsite to the northeast, and 12 of the 19 site monitor wells are located offsite.

Soil

Soil containing contaminants above cleanup standards at the Site is generally limited to the East Tank Farm area, encompassing an area of approximately 60 feet by 120 feet and 12 feet deep, as shown on Figure 2. Contaminants exceeding cleanup standards include VOCs and Total Petroleum Hydrocarbons. No off-site soil or sediment contamination was detected.

Ecological Risks

The Tier 1 Exclusion Criteria Checklist, dated April 2005, determined that conditions at the Site precluded the need for a formal ecological risk assessment (ERA) because the site meets the conditions for "de minimus land area," meaning there are insignificant ecological exposure pathways at the site.

C. PROTECTIVE CONCENTRATION LEVELS DOCUMENT

A *Protective Concentration Level* (PCL) Document was prepared in August 2006. The objective of the PCL Document is to demonstrate how PCLs and critical PCLs were selected for each site-specific Chemical of Concern (COC). Critical PCLS are the lowest PCL for a COC within a source medium determined from all of the applicable human health exposure pathways as described in 30 T.A.C. §350.71 and, when necessary, protective concentration levels for applicable ecological exposure pathways as required in 30 T.A.C. §350.77.

Site-specific data including land use, source size area, groundwater classification and soil classification have been used for the selection of appropriate assessment levels and critical PCLs. Ecological PCLs were not evaluated in this document based on results of the Tier 1 Exclusion Criteria Checklist. Land use for the Site was selected as commercial/industrial during the proposed listing public meeting held on January 11, 2001, in Clarksville City, Texas. Off-site properties are classified as residential. Because the site source area is greater than 0.5 acre, analytical data are evaluated using the 30-acre PCLs. Analytical data collected during the Phase I and II RIs and quarterly groundwater monitoring events were compared to TRRP Tier 1 PCLs applicable for the source area size and land use. Based on this evaluation, concentrations of COCs found in on-site surface and subsurface soil in the vicinity of the East Tank Farm area and both on-site and off-site shallow groundwater pose unacceptable excess risk to human heath.

D. FEASIBILITY STUDY PHASE REPORT

The *Feasibility Study* (FS) for the Voda Site, dated January 2008, was completed in two phases, the Alternative Development and Screening Technical Memorandum (ADSTM) and the Detailed Analysis Technical Memorandum (DATM):

Alternative Development and Screening Technical Memorandum

The ADSTM, dated April 2007, identified the critical PCLs for the site surface and subsurface soil and shallow groundwater, and identified general response actions for each medium including containment, treatment, excavation, pumping or other actions to satisfy the site cleanup goals. The site cleanup goals are summarized in Table 1 (soil) and Table 2 (groundwater). The general response actions for each contaminated media are summarized in Table 3 (soil) and Table 4 (groundwater).

Table 1
Cleanup Goals for Surface and Subsurface Soil

Chemicals of Concern	**ACTION LEVEL (Critical PCL)**	**REMEDIAL ACTION OBJECTIVES**
Benzene	0.013 mg/kg	Reduce COCs concentrations to levels below the action level (TRRP Tier 1 Commercial/Industrial Land Use, PCL for surface and subsurface soil to groundwater: TRRP Tier 1 C/I $^{GW}Soil_{Ing}$)
Dichloroethylene, cis-1,2-	0.12 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Benzene	3.8 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Propylbenzene, n-	67 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
MTBE	0.93 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Tetrachloroethylene	0.025 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Toluene	4.1 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Trichloroethane, 1,1,1-	0.81 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Trichloroethylene	0.017 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Trimethylbenzene, 1,2,4-	72 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Trimethylbenzene, 1,3,5-	79 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Vinyl chloride	0.011 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Xylenes, m	53 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Xylene, o	35 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$
Xylene, p	75 mg/kg	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 C/I $^{GW}Soil_{Ing}$

Table 2
Cleanup Goals for Groundwater

Chemicals of Concern	**ACTION LEVEL (Critical PCL)**	**REMEDIAL ACTION OBJECTIVES**
Benzene	5 µg/L	Reduce COCs concentrations to levels below the action level (TRRP Tier 1 PCL for groundwater ingestion: TRRP Tier 1 $^{GW}GW_{Ing}$)
Dichloroethylene, 1,1-	7 µg/L	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 $^{GW}GW_{Ing}$
Dichloroethane, 1,2-	5 µg/L	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 $^{GW}GW_{Ing}$
Vinyl chloride	2 µg/L	Reduce COCs concentrations to levels below the action level, TRRP Tier 1 $^{GW}GW_{Ing}$

Table 3
Identification and Screening of Technologies for Chlorinated VOCs in Soil

ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	TECHNOLOGY EFFECTIVENESS	TECHNOLOGY IMPLEMENTABILITY	TECHNOLOGY RELATIVE COST	PROCESS OPTION SELECTED? (Y/N)
Institutional Controls (ICs)	ICs	ICs	Restrictions and notifications placed in the deeds of impacted property.	Effective for all contaminants.	Easily implemented as part of a Remedy Standard B option. Can be used as a stand-alone option or combined with other options to achieve Remedial Action Objectives (RAOs).	Negligible capital, low Operations and Maintenance (O&M) for periodic review	**Y**
Site Controls	Physical controls	None	Erection of physical barrier to prevent access to contaminated areas.	Reduces human exposure to contaminants.	Easily implemented, but not acceptable as a stand-alone option for sites where an active RA is needed.	Moderate capital, low O&M	**N**
Containment	Surface controls	Capping	Application or placement of a barrier layer (soil, asphalt, concrete, multilayer) over areas of contamination.	Effective at containing contaminants, preventing exposure, and reducing mobility of chlorinated VOCs in contaminated soil.	Requires deed recordation and O&M.	Moderate to high capital cost, low O&M; requires periodic review	**N**
Excavation	Shallow excavation (less than 30 ft.)	Backhoe or front end loader	Machinery for digging soil.	Effective for all contaminants.	Simple to implement and access equipment and operators. Requires hauling and/or disposal of excavated material.	Low capital	**Y**
Ex-Situ Treatment	Physical/ Chemical	Biopiles/ Landfarming	Placing contaminated soils into treatment piles so that contaminants, soil, climate, and biological activity can interact dynamically as a system to degrade, transform, and immobilize contaminants. Waste piles periodically tilled to aerate the soil.	Chlorinated compounds are more difficult to degrade.	Conditions affecting biological degradation of contaminants (e.g., temperature, rain fall) are largely uncontrolled, which increases the length of time to complete remediation. Large amounts of space are required.	Moderate capital, moderate O&M	**N**

Table 3 (continued)

ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	TECHNOLOGY EFFECTIVENESS	TECHNOLOGY IMPLEMENTABILITY	TECHNOLOGY RELATIVE COST	PROCESS OPTION SELECTED? (Y/N)
In-Situ Treatment	Physical/ Chemical	Soil Vapor Extraction (SVE)	Vacuum is applied through extraction wells to create a pressure/concentration gradient that induces gas-phase volatiles to be removed from soil through extraction wells followed by treating contaminants in the vapor phase.	SVE is effective for both chlorinated and non-chlorinated VOCs.	Factors, such as the moisture content, organic content, and air permeability of the soil, will affect effectiveness. Exhaust air may require treatment to eliminate possible harm to the public and the environment. As a result of off-gas treatment, residual liquids may require treatment/disposal and spent activated carbon requires regeneration or disposal.	High capital, low O&M	**N**
Disposal (nonhazardous waste)	Off-site disposal	Non-hazardous waste landfill	Placement of untreated soil in an existing off-site permitted non-hazardous waste landfill.	Effective method for disposal.	Easily implemented	Low capital, no O&M	**Y**
Disposal (with treatment)	On-site disposal	Backfill	Use treated soil to backfill excavated areas (I.e., excavate, treat, and replace).	Effective method for disposal, but requires process to reduce contamination to below Critical PCLs, which increases costs.	Difficult to implement due to large percentage of fine particles in soil, which would impede treatment of soil to reduce contaminant concentrations prior to use as backfill.	High capital, low O&M	**N**

Table 4
Identification and Screening of Technologies for Chlorinated VOCs in Groundwater

ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	TECHNOLOGY EFFECTIVENESS	TECHNOLOGY IMPLEMENTABILITY	TECHNOLOGY RELATIVE COST	PROCESS OPTION SELECTED? (Y/N)
ICs	ICs	ICs	Restrictions and notifications placed in the deeds of impacted property.	Would be effective for the Voda site since the underlying clay bearing unit acts as a confining unit and prevents migration of COCs.	Easily implemented. Can be used as a stand-alone option or combined with other options to achieve RAOs.	Negligible capital, low O&M for periodic reviews.	**Y**
In-Situ Treatment	Physical/ Chemical	Enhanced Bioremediation	Indigenous or inoculated microorganisms degrade organic contaminants, converting them to innocuous end products. Nutrients, oxygen, or other amendments may be used to enhance process.	Effective for all contaminants.	Easily implemented but may still require extracted ground water treatment if ineffective.	Moderate capital, low O&M	**N**
In-Situ Treatment	Physical/ Chemical	Monitored Natural Attenuation (MNA)	Utilizes natural processes such as biodegradation, adsorption, neutralization, and/or oxidation/reduction that result in the reduction of COC concentrations.	Effective for all contaminants. MNA not shown to achieve remedial goals in a reasonable timeframe.	Easily implemented. Since contamination remains in place over an extended period of time (up to 30 years) it should be combined with another option to achieve RAOs. Requires additional groundwater monitoring on at least a semi-annual frequency to fully demonstrate that the plume is stable and/or decreasing in size.	Low capital, low O&M	**Y**
In-Situ Treatment	Physical/ Chemical	In-Situ Enhanced Bioremediation Using Reactive Barriers	Utilizes passive reactive barriers to stimulate aerobic biodegradation of VOCs in groundwater whereby COCs are degraded aerobically as they pass through the permeable reactive zone.	Effective for all contaminants.	Easily implemented, and would provide treatment of the groundwater contaminant plume as the groundwater migrates across the reactive barrier system. This remedy is appropriate in conjunction with soil source removal.	Low capital, low O&M	**Y**

Detailed Analysis Technical Memorandum

The DATM, dated November 2007, included the results of a detailed analysis of the ADSTM alternatives that were retained for consideration for site cleanup. These evaluation criteria include threshold and balancing criteria. Threshold criteria are those criteria that must be met for an alternative to be viable for selection as the preferred alternative. Balancing criteria form the basis for comparing alternatives when site-specific conditions are taken into consideration. A summary of this analysis for soil is included in Table 5, and for groundwater Table 6. A summary of the estimated cost for each alternative is included in Table 7.

Table 5
Detailed Analysis Summary for Soil

Evaluation Criterion	**Alternative 1 ICs**	**Alternative 2 Limited Excavation Off-Site Disposal, ICs**	**Alternative 3 Excavation Off-Site Disposal**
Threshold Criteria			
Overall protection of Human Health	No	No	Yes
Compliance with Applicable Regulations	No	No	Yes
Balancing Criteria			
Long-Term Effectiveness and Permanence	1	3	5
Short-Term Effectiveness	1	3	4
Implementability	5	5	5
Subtotal for Balancing Criteria (before Cost)	7	11	14

Table 6
Detailed Analysis Summary for Groundwater

Evaluation Criterion	**Alternative 1 ICs**	**Alternative 2 MNA, ICs**	**Alternative 3 Enhanced Biodegradation**
Threshold Criteria			
Overall protection of Human Health	No	Yes	Yes
Compliance with Applicable Regulations	No	Yes	Yes
Balancing Criteria			
Long-Term Effectiveness and Permanence	2	2	4
Short-Term Effectiveness	3	3	3
Implementability	2	2	4
Subtotal for Balancing Criteria (before Cost)	7	7	11

Table 7
Estimated Total Cost

Remedial Alternative	Estimated Cost
Soil	
1. Institutional Controls[1]	$19,600
2. Risk-based Excavation and Disposal with *ICs*	$119,099
3. Excavation and Disposal of Contaminated Soil	$612,289
Groundwater	
1. Institutional Controls with Groundwater Monitoring[2]	$440,408
2. *Monitored Natural Attenuation* with *ICs*	$491,003
3. Installation of Reactive Biobarrier System with Groundwater Monitoring and *ICs*	$506,039

[1] Includes all costs associated with the placement of an *Institutional Control(s)* as required by 30 T.A.C. §350.111, Use of *Institutional Controls*.

[2] Includes all costs associated with the placement of an *Institutional Control(s)* as required by 30 T.A.C. §350.111, Use of *Institutional Controls*, and the costs associated with groundwater monitoring and reporting.

VI. DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES

In accordance with 30 T.A.C. § 335.348(l) and the requirements of § 361.193 of the *Solid Waste Disposal Act*, the TCEQ selects the *Remedial Action* for a site by determining which remedial alternative is "the lowest cost alternative which is technologically feasible and reliable, effectively mitigates and minimizes damage to the environment, and provides adequate protection of the public health and safety and the environment." (30 T.A.C. § 335.348(l)).

In the *Feasibility Study*, several alternatives for cleaning up the soil and groundwater at the Site were evaluated, and are described below by media:

Soil

Alternative 1 - *Institutional Controls*

This alternative does not use an active response action. Potential risks to human receptors would be managed through the use of restrictive covenants and/or deed notices. There would be no protection for continued releases to groundwater.

Alternative 2 - Risk-based Excavation and Disposal with *Institutional Controls*

This alternative includes limited excavation (approximately 280 cubic yards) and off-site disposal of soil to address risks to potential future workers. Potential risks to other human receptors (i.e., residents) would be managed through the use of restrictive covenants and/or deed notices. There would be no protection for continued releases to groundwater.

Alternative 3 - Excavation and Disposal of Contaminated Soil

This alternative includes excavation of all soil which contains contaminants in excess of site critical PCLs (approximately 3,200 cubic yards) and disposal of the waste at an off-site disposal facility.

Groundwater

Alternative 1 - *Institutional Controls*

This alternative does not include the use of an active response action. Potential risks to human receptors would be managed through the use of restrictive covenants and/or deed notices. This alternative would require groundwater monitoring in excess of 15 years.

Alternative 2 - *Monitored Natural Attenuation* with *Institutional Controls*

This alternative would utilize natural processes such as biodegradation, adsorption, neutralization, and/or oxidation/reduction that result in the reduction of COC concentrations. Long-term groundwater monitoring would be required until it is demonstrated that the groundwater plume is stable and/or decreasing in size. *Institutional Controls*, such as restrictive covenants and/or deed notices, would be required until it is demonstrated that the groundwater has been decontaminated.

Alternative 3 - Reactive Biobarriers with *Institutional Controls*

As shown on Figure 3, two reactive biobarriers would be installed. The downgradient biobarrier consists of a line of 64 biosubstrate injection points oriented in a 320-ft line along the margin of the plume. A second biobarrier would be installed near the source area and consists of a line of 36 injection points along a 180 ft line. The passive barrier would be constructed by injecting biosubstrate in the upper 22 ft of the saturated zone at injection points spaced 5 ft apart. The biosubstrate would be capable of providing a long-lasting source of dissolved oxygen to promote sustained aerobic biodegradation. Based on site-specific hydrogeologic testing, the groundwater flow velocity is estimated to be approximately 820 ft/year. At this flow rate, it will take less than one year for one complete pore volume of groundwater (approximately 10.2 million gallons) to flow past the two aerobic reaction zones.

Groundwater monitoring would be required during the treatment period to demonstrate that the plume is contained and that COC concentrations are decreasing across the reactive barriers. *Institutional Controls*, such as restrictive covenants and/or deed notices, would be required until it is demonstrated that the groundwater has been decontaminated.

VII. EVALUATION OF REMEDIAL ACTION ALTERNATIVES

The evaluation of the remedial alternatives, included in the *FS* Report, is based on overall protection of human health and the environment; compliance with applicable regulations; long-term effectiveness and permanence; short-term effectiveness; implementability; and cost. Each

criterion is rated on a scale from 1 to 5, with 5 being the most preferred and 1 being the least preferred.

Soil

Overall Protection of Human Health and the Environment - Alternatives 1 and 2 are less protective of human health and the environment as both alternatives leave contaminated soil at the site and least preferred. Alternative 3 is most preferred as all soil at the site containing COCs in excess of their critical PCLs will be excavated for off-site disposal.

Compliance with Applicable Regulations - Alternatives 1 and 2 are not compliant with all Applicable Regulations as soil would be left in-place that could continue to leach contaminants into the shallow groundwater above health-based levels. Alternative 3 is complaint with all site-specific applicable regulations as this remedy would include the excavation and off-site disposal of site soils which contain contaminants COC in excess of their respective critical PCLs.

Long-Term Effectiveness and Permanence - Alternatives 1 and 2 are least preferred as soil contaminated above health-based levels would be left at the Site. Alternative 3 permanently removes soil containing COCs in excess of their critical PCLs and is preferred.

Short-Term Effectiveness - Alternatives 1 and 2 would be the least effective during remedial construction and implementation period as soil containing COCs in excess of the critical PCLs would be left in place, whereas Alternative 3 would be the most protective.

Implementability - All three Alternatives are easily implemented.

Cost - Although Alternative 3 is more costly than Alternatives 1 and 2, it is the only alternative that provides adequate overall protection of human health and the environment and provides for long-term effectiveness.

Groundwater

Overall Protection of Human Health and the Environment - Alternative 1 is the least protective of human health and the environment as COCs in excess of their critical PCLs would remain in site groundwater for an indefinite period of time. Although Alternative 2, *monitored natural attenuation*, would eventually remove the COCs from the groundwater, insufficient evidence exists to indicate that the groundwater contamination plume would not expand or to predict when the cleanup standards would be met. Alternative 3 provides the highest overall protection of human health and the environment.

Compliance with Applicable Regulations – Alternative 1 is not compliant with Applicable Regulations as COCs in excess of their critical PCLs would remain in the groundwater for an indefinite period of time. Alternative 2 cannot be shown to remove all COCs in excess of their critical PCLs within a reasonable period of time. Alternative 3 has been predicted to be compliant with applicable regulations, removing COCs in excess of their critical PCLs within a reasonable period of time.

Long-Term Effectiveness and Permanence - Alternatives 1 and 2 are the least preferred as groundwater contaminated above health-based levels would be left at the Site indefinitely. Alternative 3 permanently removes COCs in excess of their critical PCLs from the on-site and off-site groundwater plume and thus is most preferred.

Short-Term Effectiveness - Alternative 1 would be least effective during implementation as COCs in excess of their critical PCLs would remain in the groundwater indefinitely. Alternative 2, like Alternative 1, would also leave COCs in excess of their critical PCLs in the groundwater. Alternative 3 provides the highest level of short-term effectiveness as the groundwater would undergo enhanced cleanup.

Implementability - All three Alternatives are easily implemented.

Cost - Alternatives 1 and 2 are the least expensive, but Alternative 1 is not compliant with TRRP cleanup criteria. It cannot be shown that Alternative 2 will remove all COCs in excess of their critical PCLs within a reasonable period of time. Thus Alternative 3 is the only alternative that provides adequate overall protection of human health and the environment and provides for long-term effectiveness.

VIII. THE PROPOSED REMEDIAL ACTION

The TCEQ proposes excavation with off-site disposal for the on-site surface and subsurface soil (Soil Alternative 3) and the installation of reactive biobarrier wells with *institutional controls* for the on-site and off-site shallow groundwater (Groundwater Alternative 3) as the *Remedial Actions* at the Site. The proposed *Remedial Action* activities are described in detail in Part VI of this PRAD.

IX. COMMUNITY PARTICIPATION IN THE SUPERFUND PROCESS

The public is invited to comment on the proposed *Remedial Action* for the Site. Those wanting to make oral comments may do so at the public meeting scheduled for Thursday, October 23, 2008**,** at 7:00 p.m. in the Broadway Elementary School cafeteria, 200 East Broadway, Gladewater, Gregg County, Texas. The public meeting is legislative in nature and is not a contested case hearing under Chapter 2001 of the Texas Government Code. The public comment period begins September 23, 2008, and ends on October 23, 2008, at the close of the public meeting. During this time period, the public may comment on the proposed *Remedial Action* or give additional information regarding the Site or the identification of *Potentially Responsible Parties* (PRPs). Written comments concerning the proposed R*emedial Action* submitted prior to the public meeting must be received by 5:00 p.m. on October 22, 2008. Comments should be submitted to:

Carol Boucher, P.G., Project Manager
State Lead Section (MC 136)
Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087
Facsimile: (512) 239-2303
email: cboucher@tceq.state.tx.us

Any questions not addressed at the public meeting will be addressed in writing by the TCEQ after the meeting and will be placed in the Site files.

X. REMAINING STEPS IN THE SUPERFUND PROCESS

After the end of the public comment period described above, and after considering all comments received relating to the proposed *Remedial Action*, the TCEQ will select the *Remedial Action* to implement at the Site.

Any PRPs are then allowed a period of 60 days to make an offer to fund or perform the selected remedy. If any PRPs make an offer, they will be allowed an additional 60 days to negotiate the terms of an order to fund or perform the selected remedy. Whether or not PRPs come forward to fund or perform the remedy, the TCEQ will issue a final administrative order as provided by Section 361.188 of the *Solid Waste Disposal Act* (188 Order). At that time, the Site will no longer be considered a "proposed" state Superfund site but will then be "listed" on the State Registry of Superfund Sites. The State Registry is a list of sites that pose an imminent and substantial endangerment to public health and safety or the environment.

Following issuance of the 188 Order, either the PRPs or the TCEQ will complete the detailed design of the selected remedy and cause that remedy to be implemented in its entirety. At any time in this process, the TCEQ may determine that a *minor change*, *significant change*, or *fundamental change* should be made to the *Remedial Action*. If a *minor change* is implemented, the TCEQ will document the change in the Site files without the necessity for another public meeting. If a *significant change* is made, a notice describing the changes will be posted in the Texas Register and in a newspaper of general circulation in the county where the Site is located. If a *fundamental change* is considered, another public comment period and public meeting will be held to discuss that fundamentally changed proposed remedy.

Upon completion of the *Remedial Action*, the TCEQ may propose to delete the Site from the State Registry of Superfund Sites. A public meeting will be held before the Site is deleted from the State Registry.

XI. GLOSSARY

Feasibility Study (FS) - A description, screening, and analysis of the potential *Remedial Action* alternatives for a site.

Fundamental change - A change to the *Remedial Action* which uses a different approach to achieve the remedial action goals, or one that uses the same approach but results in a remedial action that is less protective than the originally proposed remedial action.

Hazard Ranking System (HRS) - The scoring system used by the TCEQ to evaluate a site for the state or federal Superfund program. The scoring system was developed by the U.S. Environmental Protection Agency (EPA) as described in 40 Code of Federal Regulations Part 300, Appendix A.

Institutional Control (IC) - A legal instrument placed in the property records in the form of a deed notice, restrictive covenant, or other form established in the TRRP rules which indicates the limitations on or conditions governing the use of the property which ensures protection of human health and the environment.

Minor change - A change to the *Remedial Action* which does not significantly affect the scope, performance, or cost of the originally proposed *Remedial Action*.

Potentially Responsible Parties (PRPs) - Persons or entities that the TCEQ considers potentially responsible for the contamination of the site pursuant to Section 361.271 of the Texas Health and Safety Code.

Proposed Remedial Action Document (PRAD) - The document which describes the TCEQ's proposed *Remedial Action*.

Protective Concentration Level (PCL) - The concentration of a chemical of concern which can remain within the source medium and not result in levels which exceed the applicable human health risk-based exposure limit or ecological protective concentration level at the point of exposure for that exposure pathway.

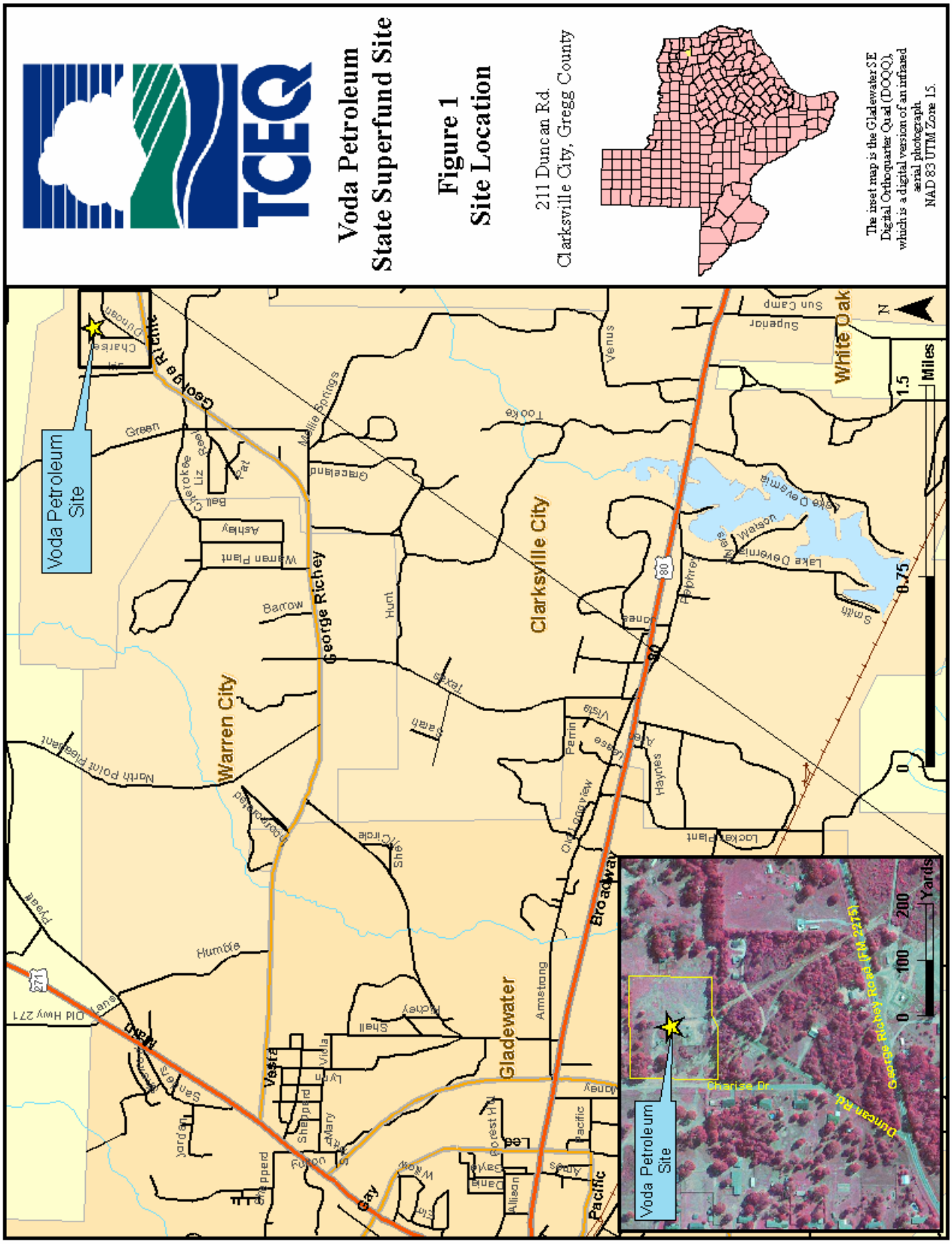
Remedial Action - An action, including remedial design and post-closure care, consistent with a remedy taken instead of or in addition to a removal action in the event of a release or threatened release of hazardous substances into the environment to prevent or minimize the release of a hazardous substance so that the hazardous substance does not cause an imminent and substantial endangerment to present or future public health and safety or the environment.

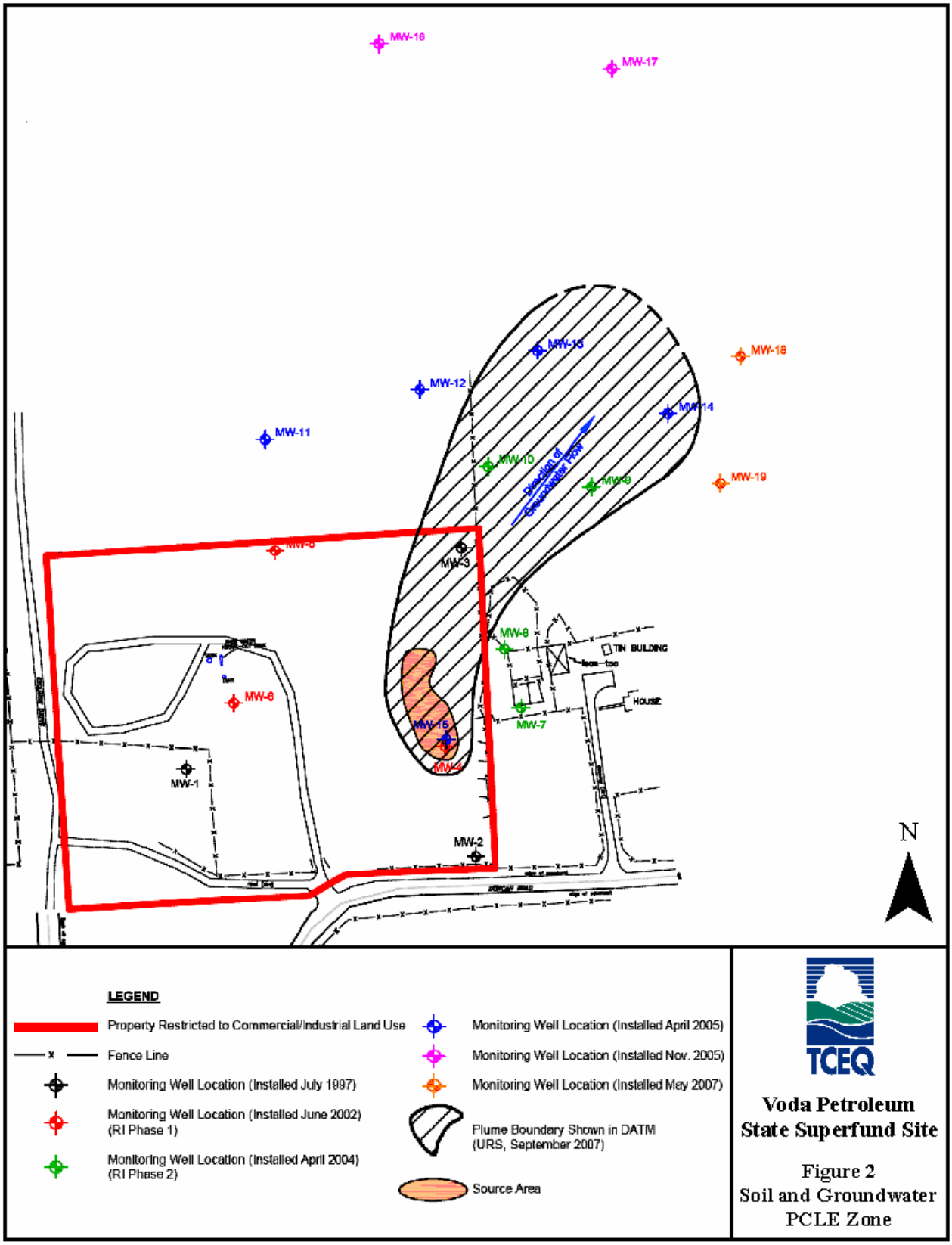
Remedial Investigation (RI) - An investigative study which may include removals, and/or a *feasibility study*, in addition to the development of *protective concentration levels*, designed to adequately determine the nature and extent of release or threatened release of hazardous substances and, as appropriate, its impact on airs, soils, groundwater and surface water, both within and beyond the boundaries of the site.

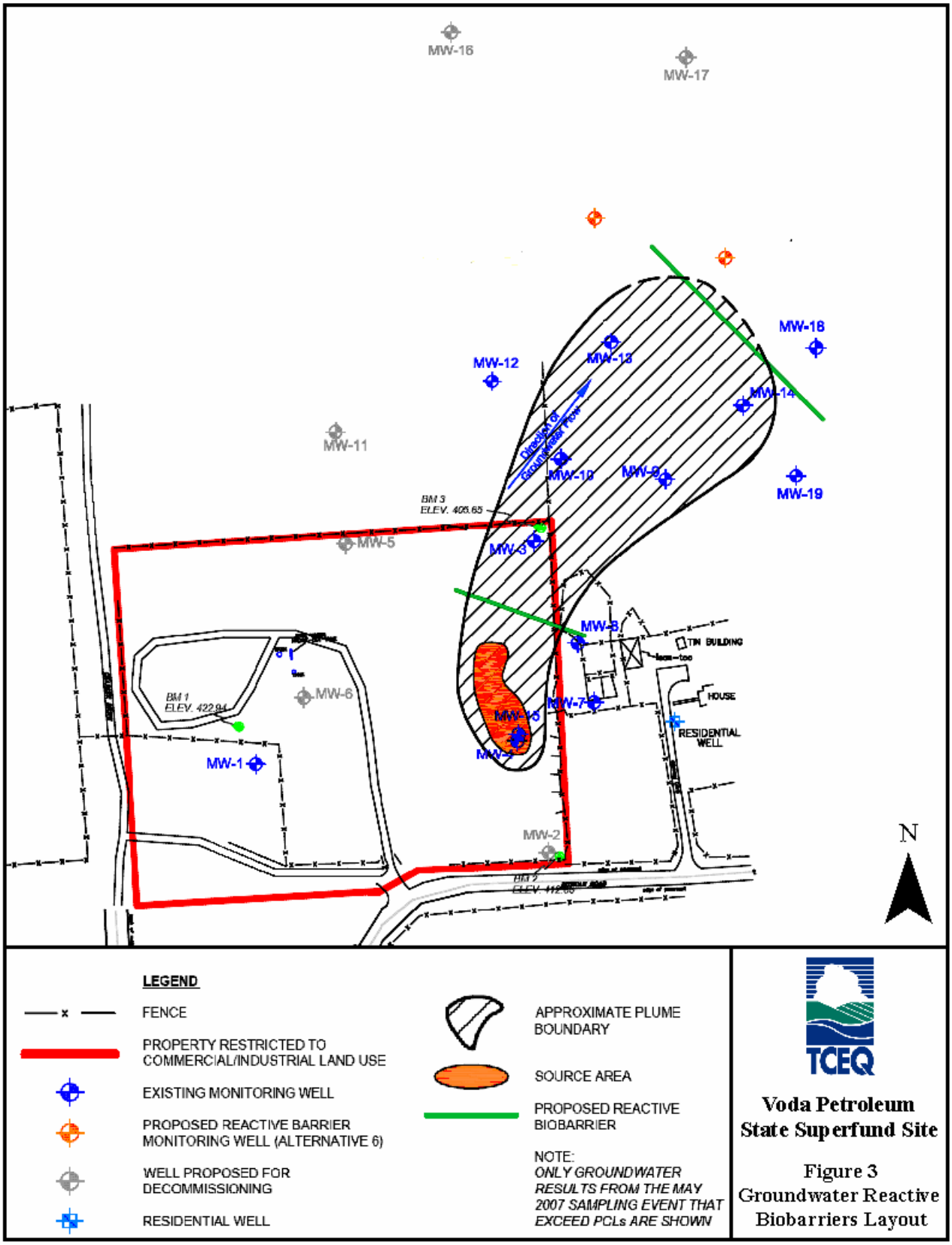
Significant change - A change to the *Remedial Action* which materially affects the scope, performance, or cost of the *Remedial Action* but which uses the same approach and results in a *Remedial Action* at least as protective as the originally proposed *Remedial Action*.

Solid Waste Disposal Act - Chapter 361 of the Texas Health and Safety Code. The purpose of the *Solid Waste Disposal Act* is to safeguard the health, welfare, and physical property of the people and to protect the environment by controlling the management of solid waste, including any hazardous waste that is generated. Subchapter F of Chapter 361 relates to the state Superfund process. The Texas Health and Safety Code is available online at: http://tlo2.tlc.state.tx.us/statutes/hs.toc.htm.

Texas Risk Reduction Program (TRRP) - A program of the TCEQ that provides a consistent corrective action process directed toward protection of human health and the environment balanced with the economic welfare of the citizens of the state. The rules for this program are located in Chapter 350 of 30 Texas Administrative Code. The Texas Administrative Code is available online at: http://www.sos.state.tx.us/tac/.


TCEQ
Voda Petroleum
State Superfund Site
Figure 1
Site Location
211 Duncan Rd.
Clarksville City, Gregg County
The inset map is the Gladewater SE Digital Orthoquarter Quad (DOQQ), which is a digital version of an infrared aerial photograph. NAD 83 UTM Zone 15.
Voda Petroleum Site
Warren City
Clarksville City
Gladewater
White Oak
George Richey
Broadway
Pacific
Vesta
Gay
Lee
Charise Dr.
Duncan Rd.
George Richey Road (FM 2275)
0
0.75
1.5
Miles
0
100
200
Yards
N


MW-16
MW-17
MW-13
MW-18
MW-12
MW-14
MW-11
MW-10
MW-9
MW-19
Direction of Groundwater Flow
MW-5
MW-3
MW-8
TIN BUILDING
HOUSE
MW-6
MW-7
MW-15
MW-4
MW-1
MW-2
N
LEGEND
Property Restricted to Commercial/Industrial Land Use
Fence Line
Monitoring Well Location (Installed July 1997)
Monitoring Well Location (Installed June 2002) (RI Phase 1)
Monitoring Well Location (Installed April 2004) (RI Phase 2)
Monitoring Well Location (Installed April 2005)
Monitoring Well Location (Installed Nov. 2005)
Monitoring Well Location (Installed May 2007)
Plume Boundary Shown in DATM (URS, September 2007)
Source Area
TCEQ
Voda Petroleum State Superfund Site
Figure 2
Soil and Groundwater PCLE Zone


MW-16
MW-17
MW-18
MW-12
MW-13
MW-14
MW-11
MW-10
MW-9
MW-19
BM 3
ELEV. 405.65
MW-5
MW-3
MW-8
TIN BUILDING
HOUSE
MW-6
BM 1
ELEV. 422.94
MW-15
MW-7
RESIDENTIAL WELL
MW-4
MW-1
MW-2
N
LEGEND
FENCE
PROPERTY RESTRICTED TO COMMERCIAL/INDUSTRIAL LAND USE
EXISTING MONITORING WELL
PROPOSED REACTIVE BARRIER MONITORING WELL (ALTERNATIVE 6)
WELL PROPOSED FOR DECOMMISSIONING
RESIDENTIAL WELL
APPROXIMATE PLUME BOUNDARY
SOURCE AREA
PROPOSED REACTIVE BIOBARRIER
NOTE:
ONLY GROUNDWATER RESULTS FROM THE MAY 2007 SAMPLING EVENT THAT EXCEED PCLs ARE SHOWN
TCEQ
Voda Petroleum State Superfund Site
Figure 3
Groundwater Reactive Biobarriers Layout