



CAPITOL HEIGHTS MINI MART

CORRECTIVE ACTION PLAN DEVELOPMENT

ATTF CP-10

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Mont Co., AL
Fac ID 23245-101-006835
UST 17-06-04



PREPARED FOR

Krish-R, Inc.
1336 Hallwood Lane
Montgomery, AL 36117

DATE

April 30, 2019

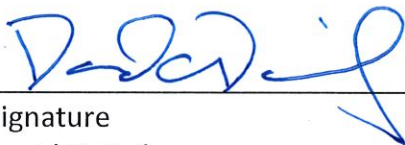
PREPARED BY

CDG Engineers & Associates, Inc.
1840 E. Three Notch St.
Andalusia, AL 36420

CERTIFICATION PAGE

"I hereby certify that, in my professional judgment, the components of this document and associated work satisfy the applicable requirements set forth in Chapter 335-6 of the ADEM Administrative Code, and are consistent with generally accepted professional consulting principles and practices. The information submitted herein, to the best of my knowledge and belief, is true accurate, and complete. I am aware that there are significant penalties for submitting false information."

This document has been prepared based on historical site assessment data and has been prepared to address soil and groundwater contamination at the Capitol Heights Mini Mart site (Facility Identification Number 23245-101-006835) in Montgomery, Montgomery County, Alabama. The recommended action should not be construed to apply to any other site.

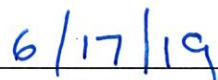


Signature

David C. Dailey

Registered Engineer in the State of Alabama

Registration No. 23095



Date



Table of Contents

	<u>Page</u>
UST Release Fact Sheet and Site Classification Checklist	1
1.0 Introduction.....	5
2.0 Summary of Previous Site Investigations	6
3.0 Summary of Previously Conducted Corrective Action	7
4.0 Remedial Objectives and Site Characterization.....	8
4.1 General Remedial Objectives	8
4.2 Vadose Zone Characterization.....	8
4.3 Aquifer Characterization.....	9
4.4 Exposure Assessment	10
4.5 Site-Specific Target Levels	10
4.6 MEME Event Data Collection.....	11
4.7 Site Characterization Conclusions	12
5.0 Remediation Rationale and Approach.....	14
5.1 Soil: Ex-Situ Methods.....	14
5.2 Soil: In-Situ Methods.....	14
5.3 Groundwater Ex-Situ Treatment	15
5.4 Groundwater In-Situ Treatment	16
6.0 Proposed Remediation Method	20
7.0 Groundwater Remediation.....	21
7.1 Groundwater Extraction	21
7.2 Groundwater Treatment System.....	23
8.0 Rationale for Selection of Remedial Method	24
9.0 Site Preparation Activities	25
9.1 Recovery Well Installation	25
9.2 Local Permitting.....	25
10.0 Installation and Optimization Activities.....	26
10.1 Equipment Review	26
10.2 Offloading and Placement	26
10.3 Utility Connections	26

10.4	Initial Startup and Optimization Activities.....	26
10.5	Permanent Start-Up.....	27
11.0	Operation and Maintenance Activities.....	28
11.1	Operation and Maintenance	28
11.2	Quarterly Sampling	29
12.0	Proposed Reporting Requirements	31
13.0	References	32

List of Tables

Title

Monitoring Point Data Summary

List of Figures

Title

Topographic Map

Site Map with Utility Locations

Lithologic Cross Section

Soil Constituent Concentration Map

Potentiometric Surface Contour Map

Groundwater/Benzene Concentration and Isocontour Map

Proposed Underground Piping and Recovery Well Network

Recovery Well Layout with Estimated Radius of Influence

Recovery Well Detail

Typical Well Head Connection for Recovery Well

Typical MPE System Diagram

List of Appendices

Appendix

Title

A	ARBCA Tier 2 SSTLs
B	Calculations
C	Equipment Specifications
D	Permit Applications / Approvals
E	Operation and Maintenance Form
F	Quality Assurance / Quality Control Plan
G	Site Health and Safety Plan

UST RELEASE FACT SHEET

GENERAL INFORMATION:

SITE NAME: Capitol Heights Mini Mart
 ADDRESS: 1705 Upper Wetumpka Road
Montgomery, Montgomery County, Alabama

FACILITY I.D. NO.: 23245-101-006835
 UST INCIDENT NO.: UST17-06-04

RESULTS OF EXPOSURE ASSESSMENT:

How many private drinking water wells are located within 1,000 ft. of site?	0
How many public water supply wells are located within 1 mile of the site?	0
Have any drinking water supply wells been impacted by contamination from this release?	No
Is there an imminent threat of contamination to any drinking water wells?	{ } Yes {x} No
Have vapors or contaminated groundwater posed a threat to the public?	{ } Yes {x} No
Are any underground utilities impacted or imminently threatened by the release?	{ } Yes {x} No
Have surface waters been impacted by the release?	{ } Yes {x} No
Is there an imminent threat of contamination to surface waters?	{ } Yes {x} No
What is the type of surrounding population?	Residential/Commercial

CONTAMINATION DESCRIPTION:

Type of contamination at site: {X} Gasoline, { } Diesel, { } Waste Oil
 { } Kerosene, { } Other _____

Free product present in wells? {X} Yes { } No Maximum thickness measured: 5.92 FT in MW-7 on 09/27/18

Maximum BTEX concentrations measured in soil: 485.13 mg/Kg BTEX in RW-2 @ 29-34'

Maximum BTEX or PAH concentrations measured in groundwater: 88.5241 mg/L in MW-7 on 03/08/18

ADEM GROUNDWATER BRANCH
UST SITE CLASSIFICATION SYSTEM
CHECKLIST

Please read all of the following statements and mark either yes or no if the statement applies to your site. If you have conducted a Preliminary or Secondary Investigation, all questions should be answered. Closure site assessment reports may not provide you with all the necessary information but answer the statements with the knowledge obtained during the closure site assessment.

SITE NAME: Capitol Heights Mini Mart
 SITE ADDRESS: 1705 Upper Wetumpka Road
Montgomery, Montgomery County, Alabama
 FACILITY I.D. NO.: 23245-101-006835
 UST INCIDENT NO.: UST 17-06-04

OWNER NAME: Krish-R, Inc.
 OWNER ADDRESS: 1336 Hallwood Lane
Montgomery, AL 36117

NAME & ADDRESS OF PERSON COMPLETING THIS FORM: CDG Engineers and Associates, Inc.
Trent Carnley, Project Manager
P.O. Box 278
Andalusia, Alabama 36420

CLASSIFICATION	DESCRIPTION	YES	NO
CLASS A	IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR		
A.1	Vapor concentrations at or approaching explosive levels that could cause health effects, are present in a residence or building.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A.2	Vapor concentrations at or approaching explosive levels are present in subsurface utility system(s), but no buildings or residences are impacted.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS B	IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR		
B.1	An active public water supply well, public water supply line or public surface water intake is impacted or immediately threatened.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.2	An active domestic water supply well, domestic water supply line or domestic surface water intake is impacted or immediately threatened.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.3	The release is located within a designated Wellhead Protection Area I.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS C	IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR		
C.1	Ambient vapor/particulate concentrations exceed concentrations of concern from an acute exposure, or safety viewpoint.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
C.2	Free product is present on the groundwater, at ground surface, on surface water bodies, in utilities other than water supply lines, or in surface water runoff.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CLASSIFICATION	DESCRIPTION	YES	NO
CLASS D	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
D.1	There is a potential for explosive levels, or concentrations of vapors that could cause acute effects, to accumulate in a residence or other building.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D.2	A non-potable water supply well is impacted or immediately threatened.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D.3	Shallow contaminated surface soils are open to public access, and dwellings, parks, playgrounds, day care centers, schools or similar use facilities are within 500 feet of those soils.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS E	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
E.1	A sensitive habitat or sensitive resources (sport fish, economically important species, threatened and endangered species, etc.) are impacted and affected.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS F	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
F.1	Groundwater is impacted, and a public well is located within 1 mile of the site.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F.2	Groundwater is impacted and a domestic well is located within 1,000 feet of the site.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F.3	Contaminated soils and/or groundwater are located within designated Wellhead Protection Areas (Areas II or III).	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS G	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
G.1	Contaminated soils and/or groundwater are located within areas vulnerable to contamination from surface sources.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS H	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
H.1	Impacted surface water, storm water or groundwater discharges within 500 feet of a surface water body used for human drinking water, whole body water-contact sports, or habitat to a protected or listed endangered plant and animal species.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS I	LONG TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
I.1.	Site has contaminated soils and/or groundwater but does not meet any of the above-mentioned criteria.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ADDITIONAL COMMENTS:

Complete the classification evaluation questions listed above. Upon completion, determine the highest rank of the site (A.1 is the highest rank) based on the statements answered with a yes.

Enter the determined classification ranking:	C.2
--	-----

1.0 INTRODUCTION

CDG Engineers & Associates, Inc. (CDG) was retained by Krish-R, Inc. (Krish-R) to complete environmental investigative and corrective action activities for the Capitol Heights Mini Mart facility located at 1705 Upper Wetumpka Road in Montgomery, Montgomery County, Alabama. Based upon the results of a Limited Phase II Environmental Site Assessment (ESA) conducted at the site in May 2017, the Alabama Department of Environmental Management (ADEM) issued a Notice of Requirement (NOR) to conduct investigative and corrective actions in correspondence dated June 21, 2017. The site is eligible for Alabama Tank Trust Fund (ATTF) reimbursement.

The work plan and cost proposal for Corrective Action Plan (CAP) development were prepared and submitted by CDG on February 14, 2019. The work plan and cost proposal for CAP development was approved by ADEM on April 9, 2019.

The following scope of work was approved for CAP Development (CP#10):

- Provide all pertinent history of the investigations and interim corrective action that has occurred at the site.
- Identify the proposed corrective action goals with supportive documentation.
- Perform a receptor survey.
- Compare the various types of potential corrective action, and make a recommendation of the type of corrective action that should be implemented at the site.
- Develop site-specific CAP with an engineered system design for the remediation of free product, groundwater and soil, incorporating the results of the free product removal, pilot testing, and other applicable activities.

This report summarizes the results of these activities.

2.0 SUMMARY OF PREVIOUS SITE INVESTIGATIONS

The Capitol Heights Mini Mart station has served as a gasoline and convenience store since it was opened in 1964. Previous investigation activities included a Limited Phase II Environmental Site Assessment conducted on May 25, 2017.

On June 21, 2017, in response to a reported release discovered during the Limited Phase II, ADEM issued Krish-R a Notification of Requirement to conduct Investigative and Corrective Actions under Release Incident #17-06-04. In a second letter dated June 21, 2017, ADEM issued a Notice of Alabama Tank Trust Fund (ATTF) Eligibility. In a third letter dated June 21, 2017, ADEM issued Pre-Approved Cost Proposal (CP #1) for conducting Preliminary Investigation activities under the ATTF.

On August 23, 2017, personnel from CDG mobilized to the site to conduct the Preliminary Investigation activities. Four soil borings were completed and permanent groundwater monitoring wells were constructed in each boring. Soil samples were collected from two locations in each soil boring. Groundwater sampling was conducted on September 5, 2017, following the installation of the monitoring wells.

A plan and cost proposal (CP-2) for the Secondary Investigation was submitted to ADEM in October 2017 and was approved as stated in the ADEM letter dated November 15, 2017. A total of four Type II monitoring wells and one Type III vertical delineation well were installed during the Secondary Investigation. In September 2018, three Type II recovery wells (RW-1 through RW-3) were installed at the site as part of Additional Well Installation Activities.

3.0 SUMMARY OF PREVIOUSLY CONDUCTED CORRECTION ACTION

Multiple Mobile Enhanced Multi-phase Extraction (MEME) events have been conducted at the site. The 8-hour to 12-hour duration MEME events were conducted on September 20, 2018, October 19, 2018, November 15, 2018, December 14, 2018, January 14, 2019, and February 4, 2019.

The MEME events were conducted at the site to provide data to assess aquifer characteristics and to evaluate recovery/removal rates for free product and dissolved hydrocarbon constituents of concern. The most recent MEME event was conducted at the site on February 4, 2019. The 12-hour event was performed using a mobile liquid ring MPVE system operated by Brown Remediation, Inc. (Brown) of Atlanta, Georgia. The system has been approved by the ADEM for use at numerous locations in Alabama for free product recovery, emergency response, and pilot testing activities. The unit operates with continuously monitored off-gas treatment (thermal destruction).

Prior to the test, static water levels were recorded. During the MEME event, the drop tubes were inserted into recovery wells RW-1, RW-2, and RW-3 and lowered to a depth just below the water table (approximately 30 feet). After the system's operation was established, the drop tube was kept in place at the static water level. Applied vacuums were recorded each ½ hour during testing (except when the unit was not attended). Measurements of flow and hydrocarbon concentrations were obtained on ½ hour intervals. Field measurements were obtained using a calibrated Foxboro TVA-1000A. Cumulative fluid recovery volumes were measured and recorded throughout the test to determine removal rates.

The 12-hour MEME event was conducted from 6:00 PM on February 4, 2019 to 6:00 AM on February 5, 2019. During the event, a vacuum of approximately 0.5 in/Hg was

applied to recovery wells RW-1, RW-2, and RW-3, which produced an average flow rate of approximately 146.8 standard cubic feet per minute (scfm).

Approximately 786.14 total pounds of hydrocarbons (127.38 equivalent gallons of gasoline) were recovered during the 12-hour event. A negligible volume of petroleum contact water (PCW) was recovered during the 12-hour event. All PCW was thermally destructed as coolant water for the rotary-lobe pump on the MEME system. The hydrocarbon removal rate and flow rate data from the extraction points over the period of the test is graphically presented in the Brown report in Appendix B.

4.0 REMEDIAL OBJECTIVES AND SITE CHARACTERIZATION

4.1 GENERAL REMEDIAL OBJECTIVES

The general objectives of the corrective action activities and the remedial efforts for the facility are as follows:

- Ensure that the health and safety of all project personnel is maintained during remediation activities.
- Prevent hydrocarbon migration to sensitive receptors.
- Remove free product from the site subsurface if present.
- Reduce dissolved petroleum hydrocarbons from groundwater to below ADEM approved Site Specific Target Levels (SSTLs).
- Accomplish these objectives in a timely and cost-effective manner.

4.2 VADOSE ZONE SOIL CHARACTERIZATION

Soil borings previously conducted during the Preliminary and Secondary Investigations were reviewed to determine the subsurface soil conditions and the feasibility of the various remediation options for the site. The COCs for the release at the site include BTEX, MTBE, and naphthalene constituents. The analytical results from the soil samples collected during the site characterization activities are summarized in the Monitoring Point Data Summary Tables. The Soil Constituent Concentration Map shows the

locations of the soil boring locations and the distribution of soil COC concentrations across the site. The vadose zone soils are predominantly comprised of clays containing occasional gravel with an average porosity of 37.4%. The average volumetric moisture content within the vadose zone was measured to be 34.2%. A cross-section of the site soils along the transect depicted in the Lithologic Cross Section in the Figures section of this report.

4.3 AQUIFER CHARACTERIZATION

The analytical results of the groundwater samples collected during the site characterization activities are summarized in Monitoring Point Data Summary Tables. Water level and product thickness measurements collected from the monitoring wells at the site are summarized in Monitoring Point Data Summary. The average historical depth to groundwater beneath the site is approximately 32.57 feet below top of casing (ft-btoc). Based on groundwater level measurements collected during the March 2019 sampling event, a potentiometric surface map (Figures section) was constructed for the site. As shown on the potentiometric surface map, the general groundwater flow direction beneath the site is predominantly to the south. The lateral hydraulic gradient (*i*) was approximately 0.048 feet per foot according to measurements taken from monitoring wells MW-5 and MW-8.

During the Secondary Investigation, slug tests were performed on monitoring wells MW-1, MW-5, and MW-8 to estimate the in-situ hydraulic conductivity of the shallow aquifer. However, due to equipment malfunction the slug test data was rendered useless. A literature value of 10^{-4} cm/s is being used for hydraulic conductivity at the site (Freeze and Cherry, 1979) based on knowledge of the site and the grain-size analysis conducted on site soils. Based on these values, the anticipated Darcy velocity (*Ki*) of groundwater flow beneath the site would be approximately 151.4 cm/yr. During the March 26, 2019 sampling event, free product was detected in monitoring and recovery wells MW-6 (3.88 feet), MW-7 (1.59 feet), MW-8 (0.08 feet), RW-1 (0.09 feet), RW-2

(1.30 feet), and RW-3 (2.66 feet). Using the analytical data from the March 2019 groundwater sampling event, an isoconcentration map for benzene (Figures section) was constructed to represent the approximate extent of the free product and dissolved hydrocarbon plumes.

4.4 EXPOSURE ASSESSMENT

An exposure assessment was conducted by CDG during the Alabama Risk Based Corrective Action (ARBCA) evaluation. The current land use site conceptual exposure model indicates that complete exposure pathways exist onsite for indoor and outdoor vapor inhalation from soil and groundwater for commercial and construction workers and for dermal contact with affected soil by commercial and construction workers. Complete exposure pathways also exist for dermal contact and indoor and outdoor vapor inhalation from impacted soil and groundwater for offsite commercial workers and construction workers. Future land use of the site and the surrounding area is expected to remain the same. There are no public water supply wells located within one mile of the site. No domestic water supply wells have been identified within 1,000 feet of the site.

4.5 SITE-SPECIFIC TARGET LEVELS

To assess the risk to human health and the environment of the dissolved hydrocarbon plume associated with the Capitol Heights Mini Mart site, an ARBCA Tier I/ Tier II evaluation was performed for the site. Details of this evaluation are contained in a report submitted to ADEM in December 2018. Based on the ARBCA Tier II evaluation, SSTLs were calculated for the various media (soil and groundwater) at the site. The SSTLs developed during this process represent petroleum hydrocarbon levels that would not pose a significant risk to any recognized actual or potential receptors. The proposed SSTLs for soil and groundwater are summarized in the following table.

Site Specific Target Levels for the Capitol Heights Mini Mart Facility						
Chemicals of Concern	Soil			Groundwater		
	Dermal Contact (mg/Kg)	On-site Indoor Inhalation (mg/Kg)	Off-Site Indoor Inhalation (mg/Kg)	Groundwater Resource Protection (mg/Kg)	On-site Indoor Inhalation (mg/L)	Off-Site Indoor Inhalation (mg/L)
Benzene	0.387	67.7	10.3	0.533	318	48.5
Toluene	143	143	143	154	526	526
Ethylbenzene	51.5	51.5	51.5	82.6	169	169
Xylenes	57.1	57.1	57.1	96.9	175	175
MTBE	377	0.518	0.518	1.45	48,000	48,000
Naphthalene	24.5	24.5	24.5	15.4	31	31

A more detailed presentation of these values is provided in Appendix A and in the December 2018 ARBCA Evaluation Report. The individual Groundwater Resource Protection (GRP) SSTLs generated for each of site monitoring wells are presented in the Monitoring Point Data Summary Tables.

4.6 MEME EVENT DATA COLLECTION

Multiple MEME events have been conducted at the site. The MEME events were conducted for durations of approximately eight to twelve hours. During each of the MEME events, recovery wells RW-1, RW-2, and RW-3 were used for extraction. The most recent MEME event was conducted at the site on February 4, 2019 by Brown. Prior to the MEME event on February 4, 2019, the water levels in recovery wells RW-1, RW-2, and RW-3 were gauged. Free product was detected in each of the recovery wells prior to the event. The results for the 12-hours of recovery are from approximately 6:00 PM on February 4, 2019 to approximately 6:00 AM on February 5, 2019. During the twelve-hour event, the average flow rate from the extraction well was calculated at 146.8 scfm. Approximately 786.14 pounds of hydrocarbon (127.38 equivalent gallons of

gasoline) were recovered during the twelve hours of recovery. A negligible volume of PCW was recovered during the event. All recovered PCW was thermally destructed as coolant water for the rotary lobe pump. Free product was detected in recovery wells RW-1 (0.01 feet), RW-2 (2.03 feet), and RW-3 (1.81 feet) following the MEME event.

4.7 SITE CHARACTERIZATION CONCLUSIONS

Soil Characterization Summary

The results of the geotechnical analyses indicate the following physical properties for the soils at the Capitol Heights Mini Mart site:

- The vadose zone soils are predominantly comprised of sandy clay, interbedded with sand and clayey sand.
- Soil has a porosity of 37.4%.
- Volumetric moisture content within the vadose zone was measured at 34.2%.
- Available porosity for vapor transport within the vadose zone is 3.2%.

Aquifer Characterization Summary

The results of the aquifer characterization at the site indicate the following physical properties for the unconfined groundwater zone beneath the site:

- The average depth to groundwater is approximately 32.57 ft-btoc.
- The average hydraulic conductivity within the saturated zone is estimated to be approximately 1×10^{-4} cm/sec.
- The general groundwater flow beneath the site is to the south.
- The average hydraulic gradient across the site is 0.048 ft/ft.
- The calculated Darcy velocity for groundwater flow is 151.4 cm/yr.
- Free product is present in multiple wells on the eastern side of the property.

Exposure/Risk Assessment Summary

Based upon current constituent concentrations and the risk assessment results, SSTLs were calculated for the site using the ARBCA process. There are complete exposure pathways for vapor inhalation from both soil and groundwater on and off-site. The dissolved hydrocarbon concentrations have historically been below the SSTL for indoor inhalation by onsite and offsite commercial and construction workers. The dissolved benzene concentrations in all of the existing monitoring and recovery wells, with the exception of monitoring MW-5, are above the approved SSTLs. Multiple wells also contain naphthalene concentrations above the approved SSTLs. The lateral extent of the free product and dissolved hydrocarbon plumes have not been defined. The presence of free product and dissolved hydrocarbon concentrations above the SSTLs will require remediation.

MEME Event Summary

Based upon the results of the MEME events conducted at the Capitol Heights Mini Mart site, the vadose zone soils allow moderate airflow, which will allow the effective remediation of the site using high vacuum extraction technologies. The average flow rate from the extraction wells during the February 4, 2019 MEME event was reported as 146.8 scfm. Based on the soil characterization there would be approximately 3.2% available pore space for vapor transport within the vadose zone. During prolonged vapor extraction events it would be typical for intrinsic permeability to increase as the moisture content drops in the shallow soils. The average vapor phase hydrocarbon recovery rate during the February 4, 2019 MEME event was approximately 65.5 pounds per hour. A minimal volume of groundwater was recovered during the February 4, 2019 MEME event. The low groundwater recovery was due to the presence of free product and high hydrocarbon recovery rates during the MEME event. The MEME system operator was not able recover groundwater without overloading the system's thermal oxidizer.

5.0 REMEDIATION RATIONALE AND APPROACH

Subsurface soil and groundwater are impacted onsite. Elevated dissolved hydrocarbon concentrations are present in the groundwater in the area beneath the fuel dispensers, the convenience store building, and the UST holds. To address COCs, which exceed the SSTLs in groundwater and soil and to prevent offsite migration, the source area must be remediated. Full-scale technologies addressing both soil and groundwater were reviewed for applicability to the Capitol Heights Mini Mart site. The discussion is divided into media (soil and groundwater) and in situ/ex situ technologies.

5.1 SOIL: EX-SITU METHODS

The excavation of the impacted soils at the site would involve a prohibitively large quantity of soil due to the areal extent of the contaminant plume. It would also impose a severe disruption on the commercial activities being conducted on the site. Furthermore, the depth of contamination is likely greater than thirty feet, which would pose significant logistical and safety challenges for excavation activities. Due to these issues, excavation was not considered as a viable remedial alternative for the site soils.

5.2 SOIL: IN-SITU METHODS

Bioremediation

Remediation of soil contamination using in-situ bioremediation involves injecting oxygen or oxygen releasing compounds directly into the source zone. The oxygen is then used to accelerate the rate of naturally occurring aerobic contaminant biodegradation in saturated soils. Volatile organic compounds in high concentrations are toxic to bacteria (EPA, 1992). Because of the presence of free product and high concentrations of dissolved phase hydrocarbons present in the source area, bio-remediation is not considered a viable remediation alternative at this time because the toxic conditions would limit the effectiveness of the microbial activity to fringe areas of the source area and the surrounding area of groundwater contamination.

SVE

Based upon the results of the MEME events conducted at the Capitol Heights Mini Mart site, SVE and MPE appear to be cost effective remedial technologies for the free product and dissolved hydrocarbon plumes. Data collected to date indicates the vadose zone soils have an effective porosity of 3.2% and moderate intrinsic permeability that would allow the effective recovery of product vapors. Based on the available data, technologies that include liquid and vapor recovery are recommended for the soil source-area contamination at this site.

5.3 GROUNDWATER EX-SITU TREATMENT

Pump and Treat

Generally for pump and treat systems to be effective, a significant capture zone must be developed. An adequate capture zone would be able to contain a dissolved phase contaminant plume, halting migration. While pump and treat methods are effective in reducing groundwater constituent concentrations and limiting offsite migrations, they do not adequately address vapor phase and absorbed phase hydrocarbon contamination at the source. Because of the presence of free product and elevated dissolved hydrocarbon concentrations in the groundwater beneath the site, some form of groundwater treatment is required.

Dual Phase Extraction

Dual phase extraction or MPE involves applying vacuum to remove liquid and vapor phase contaminants from low to moderately permeable, heterogeneous soils. In many cases, MPE provides a more efficient remedial approach as opposed to conventional pump and treat technology. The application of a vacuum to a well increases the hydraulic driving force that enables groundwater to flow into a well, while conventional pumping relies mainly on a difference in elevation head. In addition, conventional pump and treat methodology is not successful in addressing vapor phase and absorbed phase hydrocarbon contamination. The need for vapor phase and absorbed phase

hydrocarbon contaminant removal in the soil source area and for dissolved-phase hydrocarbon contaminant removal in the groundwater plume could be efficiently performed with the use of a dual phase extraction system. The MEME data collected at the site indicate that the moderate permeability in the soils at the site will allow cost effective hydrocarbon recovery using MPE technology.

Air Sparging

Air sparging technology involves the injection of air into saturated zones in effect creating a subsurface air stripper, which removes contaminants through volatilization. Air sparging technologies are designed to operate at high airflow rates to effect volatilization. Air sparging systems are operated in tandem with SVE systems in order to capture contaminants stripped from the saturated zone. Contaminant migration can be induced if a net positive subsurface pressure is created (EPA, 1995). Channeling of airflow can occur in heterogeneous formations, potentially off-gassing in undesirable locations such as on site buildings and utility conveyances. These potential negative effects can be minimized by proper design. Air sparging systems are not usually installed at sites containing high concentrations of contaminants due to the potential for contaminant spreading and the creation of hazardous and or explosive conditions.

5.4 GROUNDWATER IN-SITU TREATMENT

In-situ treatment of groundwater includes the following biological enhancement technologies: oxygen enhancement (peroxide injection, oxygen sparging), the addition of nitrates, methanotrophic degradation and natural attenuation (EPA, 1995). Chemical oxidation is another form of in-situ groundwater treatment technology.

Bioremediation

Biologic degradation of petroleum organics does not occur in proximity to gasoline free product or areas of high concentrations of volatile organic compounds (EPA, 1992). The high VOC concentrations are toxic to naturally occurring bacteria. Removal of the high

concentrations of COCs in soils and groundwater is needed prior to biological enhancement technologies, which could be potentially applicable at the site.

Because of the presence of free product and the high concentrations of dissolved phase hydrocarbons present in the source area, bio-remediation is not considered a viable remediation alternative at this time because the toxic conditions would limit the effectiveness of the microbial activity to fringe areas of the source area and the surrounding area of groundwater contamination.

Chemical Oxidation

Chemical oxidation uses reagents to transform, degrade, or immobilize organic wastes. In-Situ Chemical Oxidation (ISCO) relies on the destructive capacity of oxidants to chemically destroy the bonds of the hydrocarbons. Complete chemical oxidation of gasoline would produce carbon dioxide and water. Chemical oxidants work by producing free radicals, such as the hydroxyl radical, which oxidize the petroleum hydrocarbons. Several commonly used chemical oxidants have been used for in-situ applications on petroleum hydrocarbons and MTBE, including hydrogen peroxide, Fenton's Reagent (hydrogen peroxide with an iron catalyst, frequently performed at a low pH), sodium persulfate, and ozone.

ISCO is most often utilized at sites with elevated COC concentrations in the source area. Chemical oxidation of high concentration areas is often part of a multi-step remediation approach that paves the way for more biologically mediated, less costly approaches, such as accelerated bioremediation or monitored natural attenuation.

Based on the presence of a building, USTs, dispensers, and multiple underground utilities within the source area, CDG feels that the risks associated with the application of ISCO outweigh the benefits at the Capitol Heights Mini Mart site.

Natural Attenuation

Natural attenuation is the process by which dilution, volatilization, biodegradation, adsorption, and chemical reactivity are allowed to reduce contaminant concentrations to acceptable levels. Natural attenuation is applicable in low risk cases where active remediation is technically impracticable or deemed unnecessary due to contaminant concentrations at or below levels where natural processes can prevent plume migration. Extensive site-specific data collection is required to effectively model natural attenuation. The risks posed by the contaminants at the Capitol Heights Mini Mart site warrant an active remediation approach to accelerate the reduction of dissolved hydrocarbon concentrations in the source area. Natural attenuation could be considered as the sole method for future remediation once dissolved hydrocarbon concentrations have dropped to levels where natural processes can effectively attenuate the residual hydrocarbon constituents.

6.0 PROPOSED REMEDIATION METHOD

In an effort to decrease chemicals of concern (COC) concentrations in soil and groundwater to levels acceptable by ADEM, the installation of a dedicated MPE system is recommended for the site. The MPE system has four (4) main remedial objectives: removal of free product; removal of vapor phase COC; removal of absorbed phase COC; and removal of dissolved phase COC.

MPE was selected because it typically provides a more efficient remedial approach as opposed to conventional pump and treat technology. The application of vacuum to a well increases the hydraulic driving force that enables groundwater to flow into a well, while conventional pumping relies mainly on a difference in elevation head. In addition, conventional pump and treat methodology is not as successful in addressing vapor phase and absorbed phase contamination.

After receiving approval from ADEM, a new MPE system will be manufactured by, and purchased from MK Environmental of Willowbrook, Illinois. The MPE system will utilize one forty-horsepower (hp) oil-sealed Liquid Ring Vacuum Pump (LRVP) to produce high vacuums and airflows in an effort to remove petroleum constituents from the impacted subsurface. The LRVP will be connected to a total of ten recovery wells. All system components, excluding air treatment operations, will be enclosed in an aluminum cargo trailer. Above ground system components will be enclosed within a wooden privacy fence complete with locking gates in an effort to prevent unauthorized personnel from entering the immediate area. The fence will be placarded with a sign reading “Groundwater Remediation” and listing CDG’s emergency contact information.

Extracted fluids will travel from the extraction wells to a primary Air/Water Separator (AWS), utilized to separate vapors and groundwater. Vapors will subsequently pass through the LRVP to a catalytic oxidizer. Groundwater will flow from the AWS to an air stripper for treatment. The air stripper is capable of decreasing hydrocarbon

concentrations to below permit requirements at flows up to fifteen gallons per minute (gpm). The treated groundwater will be discharged into a storm sewer located in the southeastern corner of the site property. Exhaust from the air stripper will be routed to one 1,000 pound vapor phase carbon vessel for treatment prior to discharge to the atmosphere.

The locations of the extraction wells, extraction lines, effluent discharge and system location are presented in the Figures section. Equipment specifications and cut sheets are provided in Appendix C.

The system is outfitted with an intrinsically safe alarm sensor such that should an alarm condition occur, the system will automatically shut down until the alarm can be relieved and the system reset. These sensors are included in an effort to maintain effective operation of the system and reduce the potential for untreated discharges. The alarms will be integrated with a telemetry system to notify CDG of a system fault, so that it can be restarted as soon as possible. The telemetry system will allow CDG to remotely shut down the system. A run time (hour) meter will be installed on the system and the system will be equipped with applicable gauges and meters to allow for measurements as required for monthly and/or quarterly reporting.

7.0 GROUNDWATER REMEDIATION

The selection of an appropriate groundwater extraction system is dependant on the phases of petroleum constituents present in the groundwater and the hydrogeologic setting. For the site, petroleum constituents are primarily present in liquid and dissolved phase. Available data indicates that the ability to extract groundwater from the subsurface is achievable. Based on these conditions and findings, MPE appears to be the most feasible groundwater extraction technology for the onsite portion of the plume.

7.1 Groundwater Extraction

Based on a review of the historical groundwater elevation data, one distinct water bearing unit exists beneath the site. This unit generally appears to be confined within the moderate permeability sandy clay beneath the site. The average depth to groundwater in the Type II monitoring wells at the Capitol Heights Mini Mart site is approximately 32.57 ft-btoc.

Based on previous monitoring well gauging and sampling events conducted at the site, the direction of the shallow groundwater flow is predominantly to the south. The average lateral hydraulic gradient is approximately 0.048 feet per foot based on measurements taken from monitoring wells MW-5 and MW-8 on March 26, 2019. A potentiometric surface map from the March 26, 2019 sampling event is presented in the Figures section.

The groundwater monitoring well network at the site currently consists of eight Type II monitoring wells (MW-1 through MW-8), three Type II recovery wells (RW-1 through RW-3), and one Type III monitoring well (VW-1). Groundwater samples were collected on March 26, 2019 from all site monitoring wells. Free product was detected in monitoring and recovery wells MW-6 (3.88 feet), MW-7 (1.59 feet), MW-8 (0.08 feet), RW-1 (0.09 feet), RW-2 (1.30 feet), and RW-3 (2.66 feet) during the March 26, 2019 sampling event.

Four of the five wells sampled during the March 26, 2019 sampling event contained concentrations of benzene above ARBCA Tier II GRP SSTLs. Samples collected from monitoring wells MW-1, MW-2, MW-3, and MW-4 exceeded their respective SSTLs for benzene. The MTBE concentration in monitoring well MW-2 was also above the GRP SSTL. No other wells exceeded SSTLs for any other constituent included in the analysis. The Monitoring Point Data Summary references all exceedances in detail.

The MPE system is selected to provide high vacuums and high airflows necessary to extract fluids from the subsurface. The LRVP will be connected to ten extraction wells on site. Based on the design ROI of approximately 20 feet, these wells will be sufficient to extract liquid, vapor, dissolved, and absorbed phase hydrocarbons in the source area. The recovery well layout with estimated ROI is illustrated in the Figures section.

An average hydraulic conductivity value of 3,153.6 cm/yr (1×10^{-4} cm/sec) has been estimated for the site. This value represents the literature value typical for sandy clay. The hydraulic gradient of approximately 0.048 feet/foot was calculated using the March 2019 gauging data. The Darcy velocity is therefore approximately 151.4 cm/yr.

In order to recover groundwater from the approximate 10-foot water column, CDG recommends that a network of ten recovery wells be utilized in the source area. Existing 4-inch diameter recovery wells RW-1, RW-2, and RW-3 will be connected to the proposed MPE system. Seven new 4-inch diameter recovery wells will also be installed at the site. The new proposed recovery wells will be installed to a target depth of approximately 40 ft-bgs, and will include approximately 15 feet of 0.020-inch slotted screen. The recovery well locations and piping network are illustrated in in the Figures section. A recovery well detail is also illustrated in the Figures section.

A one-inch diameter flexible Spiralite® drop tube, extending to approximately one foot below the static groundwater level, will be installed in each extraction well. The groundwater, along with vapors, will travel up the drop tube, out of the well head and into a 2-inch diameter PVC conduit connecting to a manifold, which is connected directly to the AWS1 inside the MPVE system building. Each recovery wellhead is equipped with a brass ball valve located inside the recovery well vault in order to control the vacuum and flow at each well.

Recovered fluids will flow directly to the AWS1, utilized to separate vapors from groundwater. Groundwater will be transferred to the AWS1 to the OWS by means of a 1.5 hp centrifugal pump. A total flow meter was placed in line to record the volume of groundwater recovered.

7.2 Groundwater Treatment System

The selection of an appropriate groundwater treatment system was based on the expected flow rate of the extraction system, the influent contaminant concentrations of the groundwater, and discharge limits. Based on the available data, it appears that air stripping is the most feasible and cost-effective method for treatment of recovered groundwater.

The treated effluent will be discharged to a storm sewer located in the southeastern corner of the site property. A 1-inch diameter discharge line will be installed from the system compound to the storm sewer. A copy of the NPDES Permit application is presented in Appendix D. The discharge will be sampled monthly and the electronic Discharge Monitoring Reports (eDMRs) submitted to ADEM in accordance with the permit requirements.

8.0 RATIONALE FOR SELECTION OF REMEDIAL METHOD

The selection of an appropriate remedial method is dictated by a number of factors, including but not limited to: site setting, type and extent of contamination present, potential receptors, availability of resources, discharge requirements, clean up time, and cost effectiveness.

Based on the exposure assessment conducted at the site and the historical analytical data, contamination at the subject site does not appear to pose an immediate threat to the surrounding population. It does not appear that natural attenuation is occurring at an acceptable rate. Free product is present in multiple wells, and dissolved hydrocarbon concentrations exceed the SSTLs in numerous wells. Based on these observations the ADEM has required that active remedial efforts be initiated on site. Furthermore, offsite migration of the hydrocarbon plume has likely already occurred.

The presence of soil and groundwater contamination requires a remedial technology that will adequately address these phases of contamination. Based on the specific site data collected to date, it appears that MPE is the most technically feasible remedial alternative for this site.

Based on CDG's opinion, the remedial approach described herein is designed to perform in a cost effective and reliable manner throughout the life of the project. Based on the clean-up time calculations, presented in Appendix C, the estimated clean-up time for the system is approximately 1.7 years. However, based on CDG's professional experience with similar remediation systems, CDG believes that three to five years is a reasonable clean-up time estimate. The total estimated clean-up cost for this incident, including system installation, and twelve (12) quarters of O&M, is approximately \$500,000.

9.0 SITE PREPARATION ACTIVITIES

Site preparation activities will be conducted prior to system arrival at the property. These activities will consist of the installation of underground piping associated with the recovery well network. The piping located in the paved areas will be installed using directional boring technology. The remaining piping will be installed in trenches. Traffic rated well vaults will be installed above each recovery well.

9.1 RECOVERY WELL INSTALLATION

Ten recovery wells will be connected to the proposed MPE system at the site. The locations of the recovery wells are shown in Figures section.

Each of the recovery wells will be located onsite. Existing 4-inch diameter recovery wells RW-1, RW-2, and RW-3 will be utilized as recovery wells, without modification. Seven new recovery wells are proposed at the site. The proposed new recovery wells will be installed to a depth of approximately 40 ft-bgs, with screened intervals from approximately 25 to 40 ft-bgs. All proposed recovery wells will be constructed with 4-inch diameter well materials, including 15 feet of 0.020-inch slotted screen. The location, depth, diameter, and screened interval for these wells were selected to insure that sufficient drawdown can be induced in the water table.

9.2 LOCAL PERMITTING

CDG personnel contacted representatives of the City of Montgomery to discuss permits and zoning applicable to the installation of the proposed remediation system. According to the city officials, a building permit will be necessary in order to receive electrical service and to construct the fence around the proposed MPE system compound.

10.0 INSTALLATION AND OPTIMIZATION ACTIVITIES

The MPE system, and all ancillary equipment, will be delivered to the site within thirty days of approval from ADEM. A professional engineer experienced in MPE system operation and an environmental technician will be on site to observe installation and optimization activities.

10.1 EQUIPMENT REVIEW

An equipment manual and troubleshooting guide will be provided to CDG by the equipment supplier prior to system arrival. Appropriate CDG personnel will familiarize themselves with the manual before starting and operating equipment.

10.2 OFFLOADING AND PLACEMENT

The skid-mounted system and the ancillary equipment will be transported on a trailer and offloaded with a crane. The system was placed in the approximate location illustrated in the Figures section. Above ground system components will be enclosed within a wooden privacy fence complete with locking gates in an effort to prevent unauthorized personnel from entering the immediate area.

10.3 UTILITY CONNECTIONS

The electrical, telephone, and wastewater discharge connections will be completed by CDG's subcontractor in accordance with local requirements.

10.4 INITIAL START-UP AND OPTIMIZATION ACTIVITIES

Once all connections are made, each electric motor will be visually tested prior to initiating long-term operation. This consists of momentarily operating each motor individually and verifying that the shafts are rotating in the proper direction. The MPE system will be temporarily operated for a period of four to eight hours. During this time, system components will be checked and monitored to ensure the system is operating as

expected. Alarm conditions will be manually simulated to verify that automatic shutdown operations will occur if needed.

The following observations will be monitored / analyzed as appropriate:

- Extraction Rate (air and liquids)
- Vacuum at the LRVP and at each extraction well
- Influent and effluent vapor concentrations (PID measurements)

The NPDES discharge limits issued for groundwater remediation systems are:

Water:

pH:	Range from 6.0 to 8.5
Benzene	0.0155 mg/L
Toluene	8.723 mg/L
Ethylbenzene	1.244 mg/L
Xylene	Monitor Only
MTBE	Monitor Only
Naphthalene	0.62 mg/L
Oil and Grease	<15.0 mg/L

10.5 PERMANENT START-UP

The system will be permanently started once it is observed that the treatment system is capable of producing effluent discharge within the required limits. Once permanent operations are initiated, CDG personnel will remain on site for a minimum of one day to monitor system performance. Modifications will be made as necessary in an effort to enhance system operations. Operation parameters monitored during system testing activities will be evaluated further during this time.

11.0 OPERATION AND MAINTENANCE ACTIVITIES

Upon the completion of the initial optimization, CDG will implement an Operation and Maintenance (O&M) program to adequately monitor system performance.

11.1 OPERATION AND MAINTENANCE

Full scale operations will include O&M of the system and continuing optimization of system performance. Scheduled visits will be made to maintain the system components and ensure the system is operating at the greatest efficiency possible. Minor system components will be regularly inspected and replaced as required. All pumps and compressors within the unit will be serviced on a routine basis. If a shutdown of the system occurs, CDG will attempt to provide personnel to repair the system within 72 hours of receiving notification of shutdown.

Typical O&M activities will include the following:

- Visual inspection of the treatment system components (including pipe connections and bolted flange plates for potential leaks due to vibration)
- Cleaning, inspection, and testing of float switches and conductivity probes
- Monitoring of vacuum levels at designated points in the system
- Monitoring pressure levels on the exhaust side of the LVRP
- Removal of silt and sludge build up from the knockout pot, filtration system, and other system components
- Removal of air stripper foulants
- Monitor destruction efficiency of the granular activated carbon
- Treated groundwater effluent sample collection
- Monitor groundwater levels

In order to ensure the system is working properly, during the first quarter of operation, technicians will visit the site bi-weekly to inspect the carbon vessels and measure concentrations with a photo-ionization detector (PID). During two visits per month, routine O&M activities as described above will also be conducted. System data, including total operational system hours, temperatures, flow, and water discharge will be recorded for inclusion in quarterly reports to the ADEM.

All activities will be performed in accordance with the Quality Assurance/Quality Control Plan and Site Health and Safety Plan included in Appendices F and G, respectively.

11.2 QUARTERLY SAMPLING

As part of O&M activities, a groundwater monitoring event will be conducted once per quarter to evaluate the effectiveness of the remediation system. CDG recommend that each of the wells be sampled during the quarterly groundwater monitoring activities.

Prior to sample collection, the depth to groundwater will be measured using an oil/water interface probe. Each monitoring and recovery well will be purged using clean plastic disposable bailers. Approximately three well volumes will be removed from each well. The purge water will be treated by the MPE system.

Samples will be collected using clean plastic disposable bailers and shipped in laboratory supplied 40-mL vials preserved with hydrochloric acid (HCl). The samples will be placed on ice and transported, under chain of custody protocol, to the CDG laboratory in Andalusia, Alabama for analysis of BTEX/MTBE/Naphthalene in accordance with EPA method 8260B.

Groundwater effluent samples will be collected monthly. Effluent samples will be collected from a sample port after leaving the oil-water separator, prior to exiting the system. Effluent samples will be collected in laboratory-supplied 40-mL vials preserved

with HCl. Oil and Grease samples will be collected in one-liter glass jars preserved with hydrochloric acid (HCl). These samples will be packed on ice and shipped, under chain of custody protocol, to the CDG laboratory in Andalusia, AL for analysis for total BTEX/MTBE/Naphthalene, pH, and Oil and Grease in accordance with EPA Methods 8260B, 150.1, and 1664.

Influent and effluent exhaust will be monitored bi-weekly using a photo-ionization detector (PID) to ensure the destruction efficiency of the vapor phase carbon. All sampling shall be completed in accordance with the procedures set forth in the Quality Assurance/Quality Control Plan (Appendix F).

Quarterly Corrective Action System Effectiveness Monitoring Reports (CASEMR) will be completed in accordance with ADEM requirements. The reports will include a summary of all current and historic sample analysis data with corresponding figures and tables, summary of gallons of treated groundwater to date, and a discussion of system effectiveness/runtime. The reports will include recommendations for adjustments to the system, if any, and an estimate of the time required for completion of remediation activities.

12.0 PROPOSED REPORTING REQUIREMENTS

CDG will submit reports in accordance with ADEM requirements. These reports will include the following:

Start Up Notification

This report will provide start up notification within 15 days of corrective action start up.

Report of Corrective Action Implementation

This report will be submitted following MPE system installation and start-up activities have been completed. This report will include as-built drawings of the system, analytical results of the first sampling event and copies of all permits issued to date.

Reporting of Corrective Action Effectiveness

CDG proposes to submit quarterly CASEMR reports, which will summarize field activities and the progress of the system towards SSTLs. The following data will be included in each report: groundwater elevations, gallons of water treated, and groundwater analytical results. The reports will also include system effectiveness and recommendations concerning additional modifications deemed necessary.

Request for Closure Evaluation of Corrective Action

The remediation goals for this project include the removal of free product and the reduction of dissolved hydrocarbon concentrations to below the SSTLs. This report will include data that shows that remediation goals have been achieved and request No Further Action (NFA) status. Methods for removal of equipment and abandonment of monitoring and recovery wells will be described.

Site Closure Report

This report will describe in detail the closure of the site and removal of all remediation equipment.

13.0 REFERENCES

CDG Engineers & Associates, Inc., September 2017; **Report of Preliminary Investigation**, Capitol Heights Mini Mart, Montgomery, Alabama.

CDG Engineers & Associates, Inc., March 2018; **Report of Secondary Investigation**, Capitol Heights Mini Mart, Montgomery, Alabama.

CDG Engineers & Associates, Inc., September 2018; **Report of Additional Well Installation**, Capitol Heights Mini Mart, Montgomery, Alabama.

CDG Engineers & Associates, Inc., December 2018; **Report of Alabama Risk-Based Corrective Action Tier I/Tier II Evaluation**, Capitol Heights Mini Mart, Montgomery, Alabama.

CDG Engineers & Associates, Inc., December 2018; **Report of Corrective Action Plan Evaluation**, Capitol Heights Mini Mart, Montgomery, Alabama.



Engineering. Environmental. Answers.

Tables

Monitoring Point Data Summary Table

SITE NAME:	Capitol Heights Mini Mart			UST NUMBER:	17-06-04	WELL ID:	MW-6		
INSTALLATION DATE:	02/27/18	WELL DEPTH (FT BTOC):	39.90	SCREEN INTERVAL (FT):	24.90-39.90	CASING ELEV (FT ABOVE MSL):	313.90	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
03/08/18	NOT SAMPLED - FREE PRODUCT (0.10 FT)						
09/20/18	CA VIA MEME						
09/27/18	0.8148	17.7639	42.0109	3.5154	18.7277	82.0179	0.8041
12/19/18	NOT SAMPLED - FREE PRODUCT (2.90 FT)						
03/26/19	NOT SAMPLED - FREE PRODUCT (3.88 FT)						
GRP SSTLs:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLs:	48000	318	526	169	175	-	31

Monitoring Point Data Summary Table

SITE NAME:	Capitol Heights Mini Mart	UST NUMBER:	17-06-04	WELL ID:	MW-7						
INSTALLATION DATE:	02/28/18	WELL DEPTH (FT BTOC):	39.70	SCREEN INTERVAL (FT):	24.70-39.70	CASING ELEV (FT ABOVE MSL):	314.56	WELL TYPE:	II	DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
03/08/18	<0.200	12.4618	39.5805	5.8041	30.6777	88.5241	1.2249
09/20/18	CA VIA MEME						
09/27/18	<0.200	14.4355	42.2657	3.3372	17.1892	77.2276	0.6909
12/19/18	NOT SAMPLED - FREE PRODUCT (1.13 FT)						
03/26/19	NOT SAMPLED - FREE PRODUCT (1.59 FT)						
GRP SSTLs:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLs:	48000	318	526	169	175	-	31

Monitoring Point Data Summary Table									
SITE NAME:	Capitol Heights Mini Mart			UST NUMBER:	17-06-04	WELL ID:	MW-8		
INSTALLATION DATE:	02/28/18	WELL DEPTH (FT BTOC):	39.95	SCREEN INTERVAL (FT):	24.95-39.95	CASING ELEV (FT ABOVE MSL):	314.92	WELL TYPE:	II
							DIAMETER (IN):		2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
03/08/18	<0.2000	1.8410	19.3181	3.0202	16.2986	40.4779	0.5401
09/20/18	CA VIA MEME						
09/27/18	<0.2000	3.4953	18.4033	6.2227	31.2149	59.3362	1.4742
12/19/18	NOT SAMPLED - FREE PRODUCT (0.19 FT)						
03/26/19	<0.1000	2.5105	8.3635	3.2589	17.2115	31.3444	0.7431
GRP SSTLS:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLS:	48000	318	526	169	175	-	31

Monitoring Point Data Summary Table

SITE NAME:	Capitol Heights Mini Mart	UST NUMBER:	17-06-04	WELL ID:	VW-1			
INSTALLATION DATE:	02/26/18	WELL DEPTH (FT BTOC):	49.00	SCREEN INTERVAL (FT):	44.00-49.00	CASING ELEV (FT ABOVE MSL):	313.59	WELL TYPE: III
								DIAMETER (IN): 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
03/08/18	0.1271	0.4586	0.0989	0.0669	0.2221	0.8465	0.0754
09/20/18	CA VIA MEME						
09/27/18	0.1986	0.6205	0.1494	0.1982	0.2542	1.2223	0.1874
12/19/18	0.1792	0.6634	0.1813	0.1737	0.2574	1.2758	0.1559
03/26/19	0.1763	0.7103	0.1582	0.2032	0.2733	1.3450	0.1519
GRP SSTLS:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLS:	48000	318	526	169	175	-	31

Monitoring Point Data Summary Table

SITE NAME:	Capitol Heights Mini Mart			UST NUMBER:	17-06-04	WELL ID:	RW-1		
INSTALLATION DATE:	09/18/18	WELL DEPTH (FT BTOC):	40.00	SCREEN INTERVAL (FT):	25.00-40.00	CASING ELEV (FT ABOVE MSL):	314.91	WELL TYPE:	II
							DIAMETER (IN):	4	

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
09/20/18	CA VIA MEME						
09/27/18	<0.2000	11.9679	38.8894	3.2565	16.8856	70.9994	0.6124
12/19/18	<0.2500	9.6011	39.5393	3.4771	17.9318	70.5493	0.7923
03/26/19	<0.2500	9.5468	46.5511	17.2453	36.2006	109.5438	6.5036
GRP SSTLs:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLs:	48000	318	526	169	175	-	31

Monitoring Point Data Summary Table

SITE NAME:	Capitol Heights Mini Mart	UST NUMBER:	17-06-04	WELL ID:	RW-2						
INSTALLATION DATE:	09/17/18	WELL DEPTH (FT BTOC):	39.60	SCREEN INTERVAL (FT):	24.60-39.60	CASING ELEV (FT ABOVE MSL):	314.18	WELL TYPE:	II	DIAMETER (IN):	4

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
09/20/18	CA VIA MEME						
09/27/18	<0.2000	7.2137	15.9380	2.1908	10.8587	36.2012	0.5566
12/19/18	NOT SAMPLED - FREE PRODUCT (5.70 FT)						
03/26/19	NOT SAMPLED - FREE PRODUCT (1.30 FT)						
GRP SSTLs:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLs:	48000	318	526	169	175	-	31

Monitoring Point Data Summary Table

SITE NAME:	Capitol Heights Mini Mart			UST NUMBER:	17-06-04	WELL ID:	RW-3		
INSTALLATION DATE:	09/18/18	WELL DEPTH (FT BTOC):	40.00	SCREEN INTERVAL (FT):	25.00-40.00	CASING ELEV (FT ABOVE MSL):	313.64	WELL TYPE:	II
								DIAMETER (IN):	4

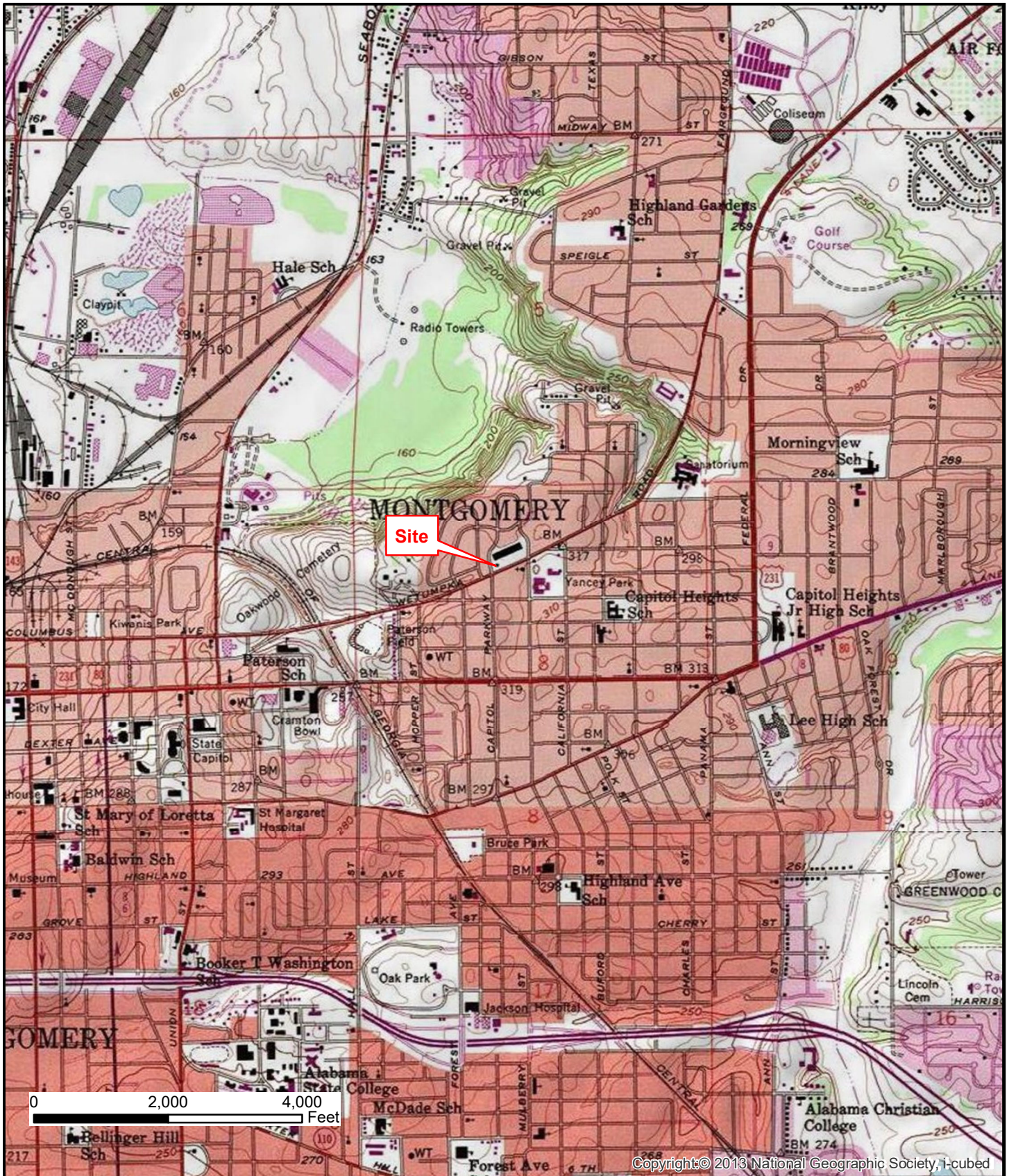
Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
09/20/18	CA VIA MEME						
09/27/18	<0.2000	5.2455	17.7849	1.9810	10.9404	35.9518	0.6826
12/19/18	NOT SAMPLED - FREE PRODUCT (2.30 FT)						
03/26/19	NOT SAMPLED - FREE PRODUCT (2.66 FT)						
GRP SSTLs:	0.691	0.173	34.5	24.2	175	-	0.691
Inhalation SSTLs:	48000	318	526	169	175	-	31



Engineering. Environmental. Answers.

Figures



Engineering. Environmental. Answers.
www.edge.com

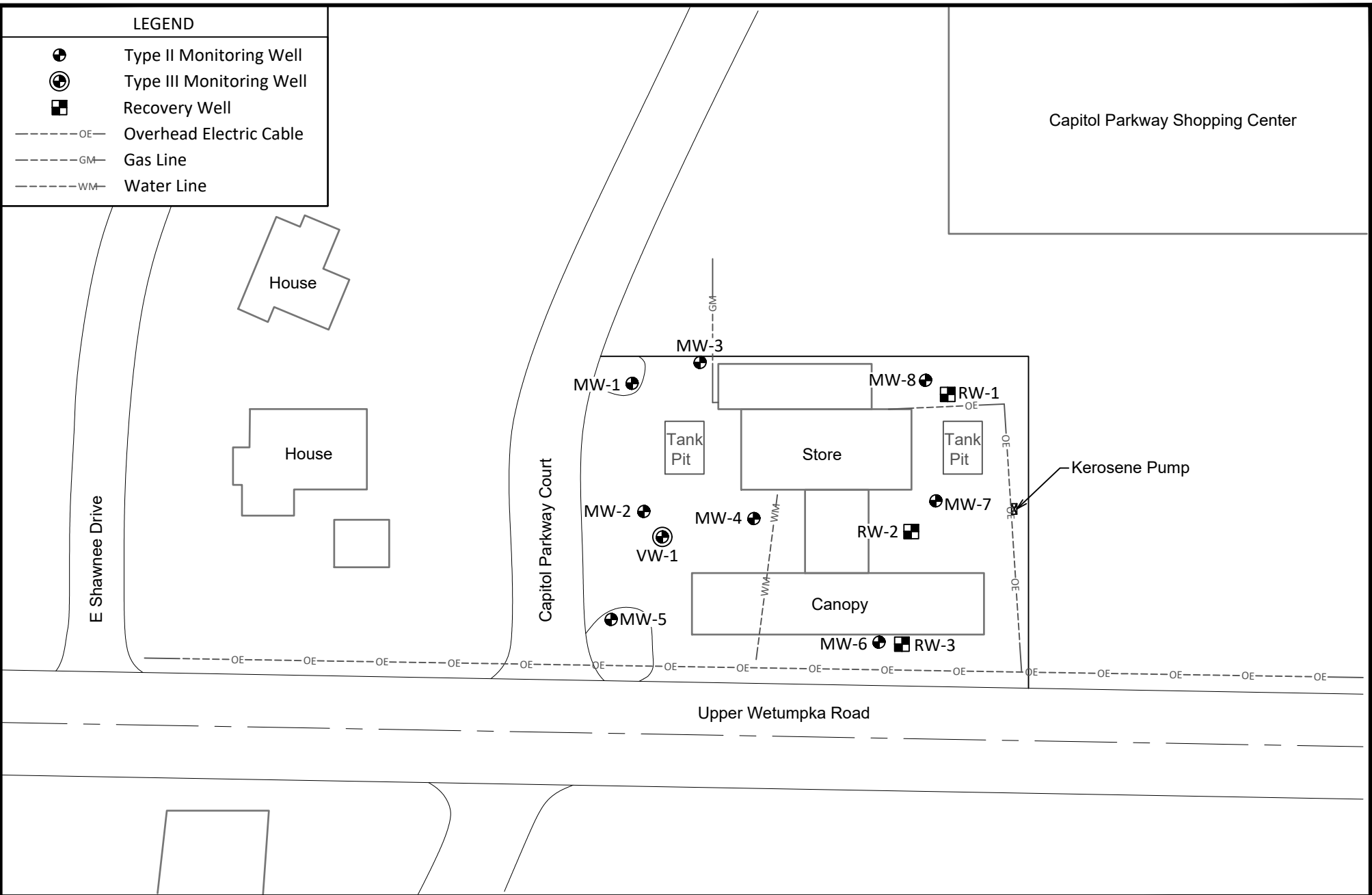
Site Location USGS Topographic Map

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL



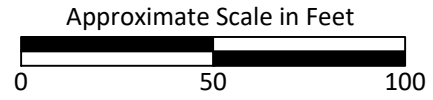
LEGEND

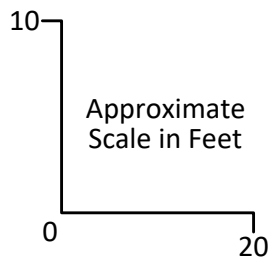
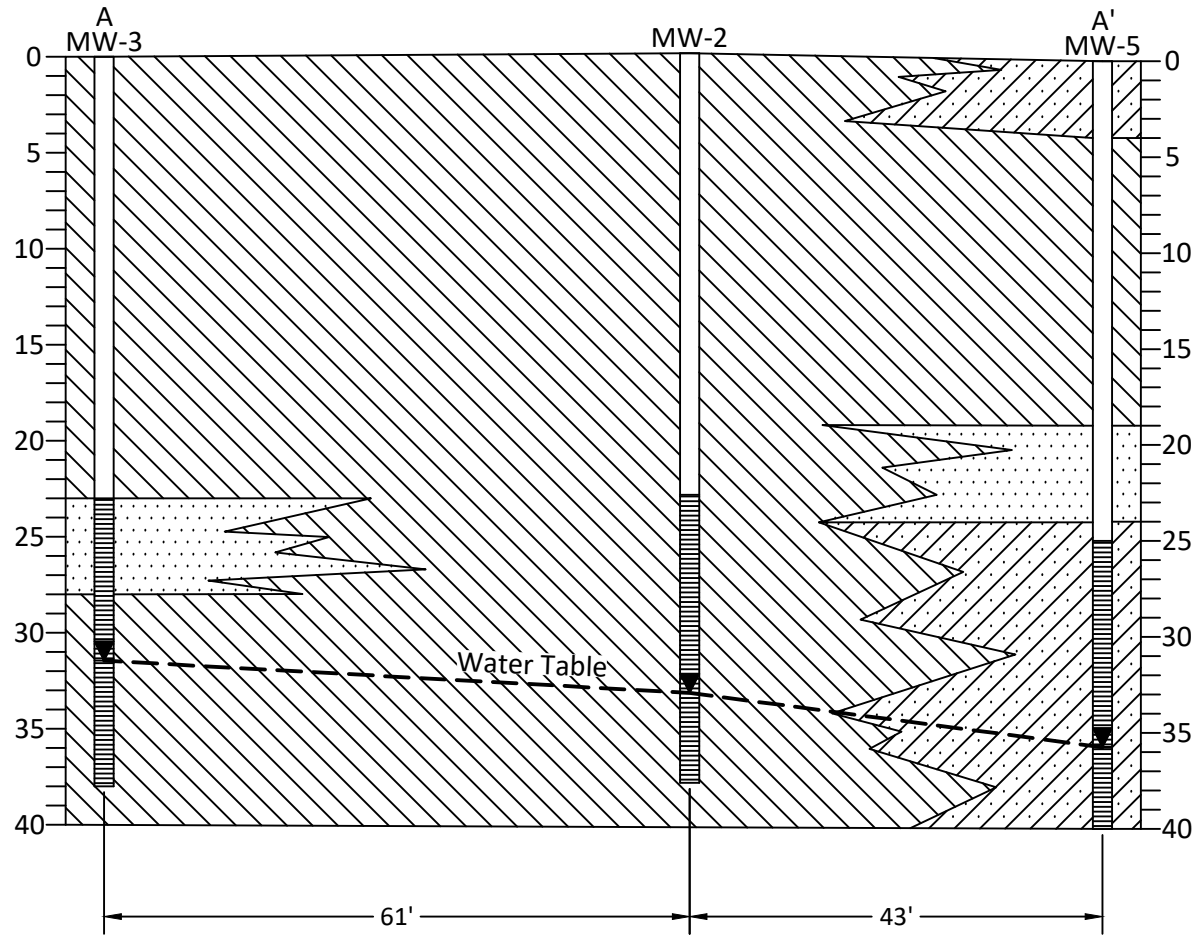
- ⊕ Type II Monitoring Well
- ⊕ Type III Monitoring Well
- Recovery Well
- OE----- Overhead Electric Cable
- GM----- Gas Line
- WM----- Water Line








Site Map with Utility and Well Locations

Capitol Heights Mini Mart
 1705 Upper Wetumpka Road
 Montgomery, Montgomery County, AL





Legend

-  Clayey Sand
-  Sandy Clay
-  Sand
-  Screened Interval
-  Groundwater Level



Engineering. Environmental. Answers.
www.cdge.com

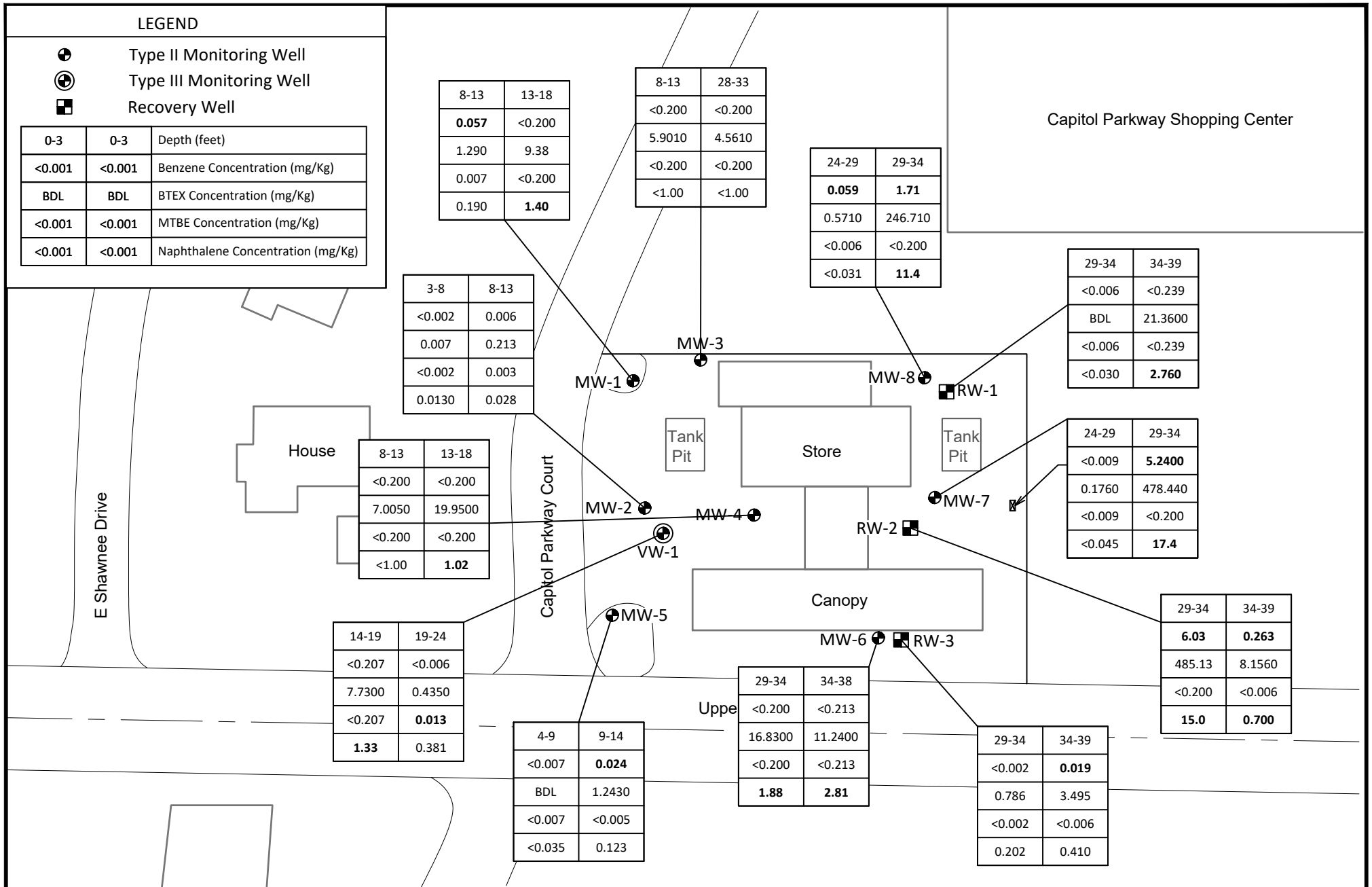
Lithologic Cross-Section A-A'

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL

LEGEND

- Type II Monitoring Well
- Type III Monitoring Well
- Recovery Well

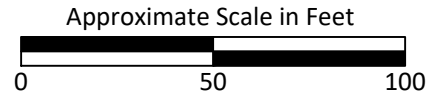
0-3	0-3	Depth (feet)
<0.001	<0.001	Benzene Concentration (mg/Kg)
BDL	BDL	BTEX Concentration (mg/Kg)
<0.001	<0.001	MTBE Concentration (mg/Kg)
<0.001	<0.001	Naphthalene Concentration (mg/Kg)








Soil Analytical Map

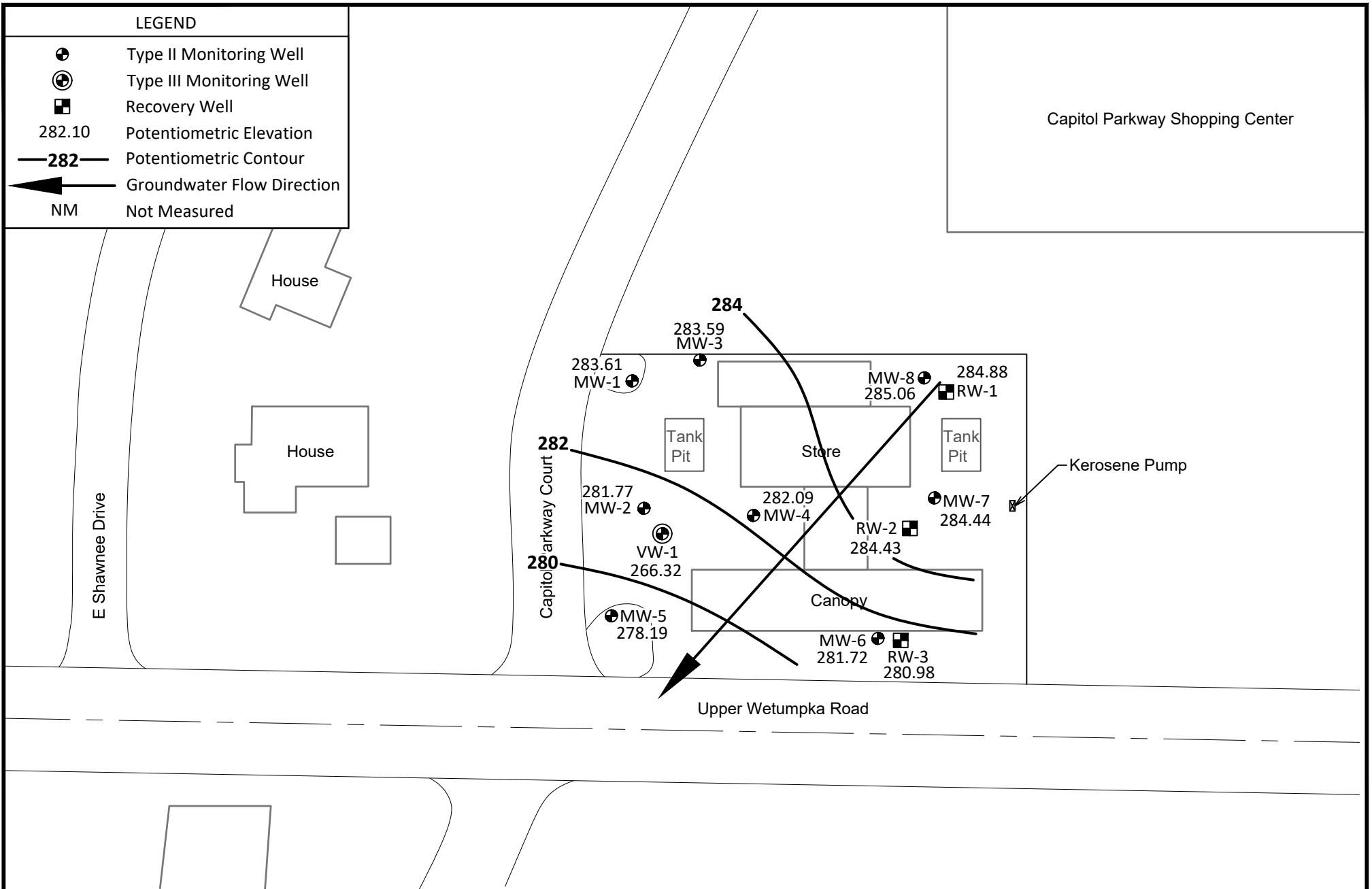


Capitol Heights Mini Mart
 1705 Upper Wetumpka Road
 Montgomery, Montgomery County, AL



LEGEND

-  Type II Monitoring Well
-  Type III Monitoring Well
-  Recovery Well
- 282.10 Potentiometric Elevation
-  Potentiometric Contour
-  Groundwater Flow Direction
- NM Not Measured



Engineering. Environmental. Answers.
www.cdge.com

Potentiometric Surface Map
March 26, 2019

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL



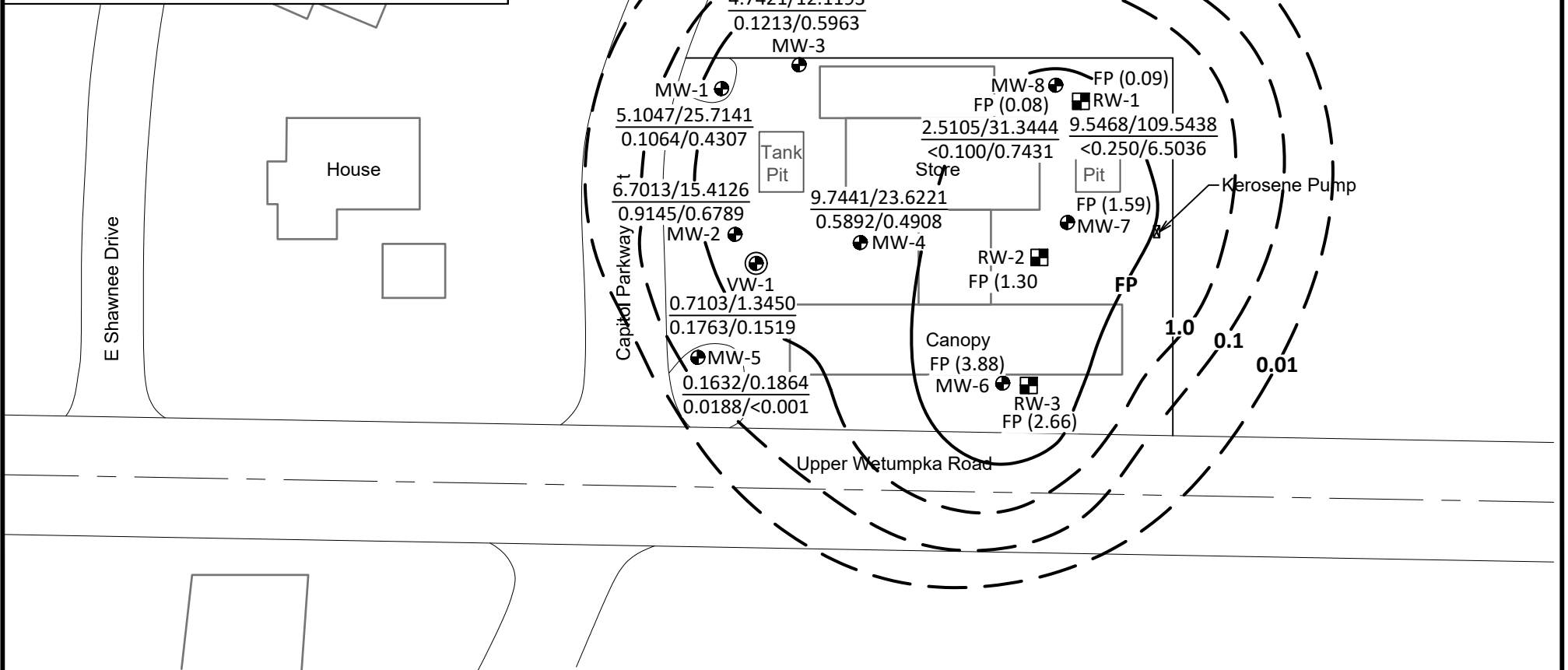
Approximate Scale in Feet



LEGEND

- ⊕ Type II Monitoring Well
- ⊗ Type III Monitoring Well
- Recovery Well
- $\frac{<0.001/BDL}{<0.001/<0.001}$ Benzene/BTEX Concentration (mg/L)
MTBE/Naphthalene Concentration (mg/L)
- 0.01— Benzene Contour
- BDL Below Detection Limit
- NS Not Sampled
- FP (0.10) Free Product Thickness (feet)
- FP— Free Product Contour

Capitol Parkway Shopping Center



Engineering. Environmental. Answers.
www.cdge.com

Groundwater Analytical and Benzene Contour Map
March 26, 2019









Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL



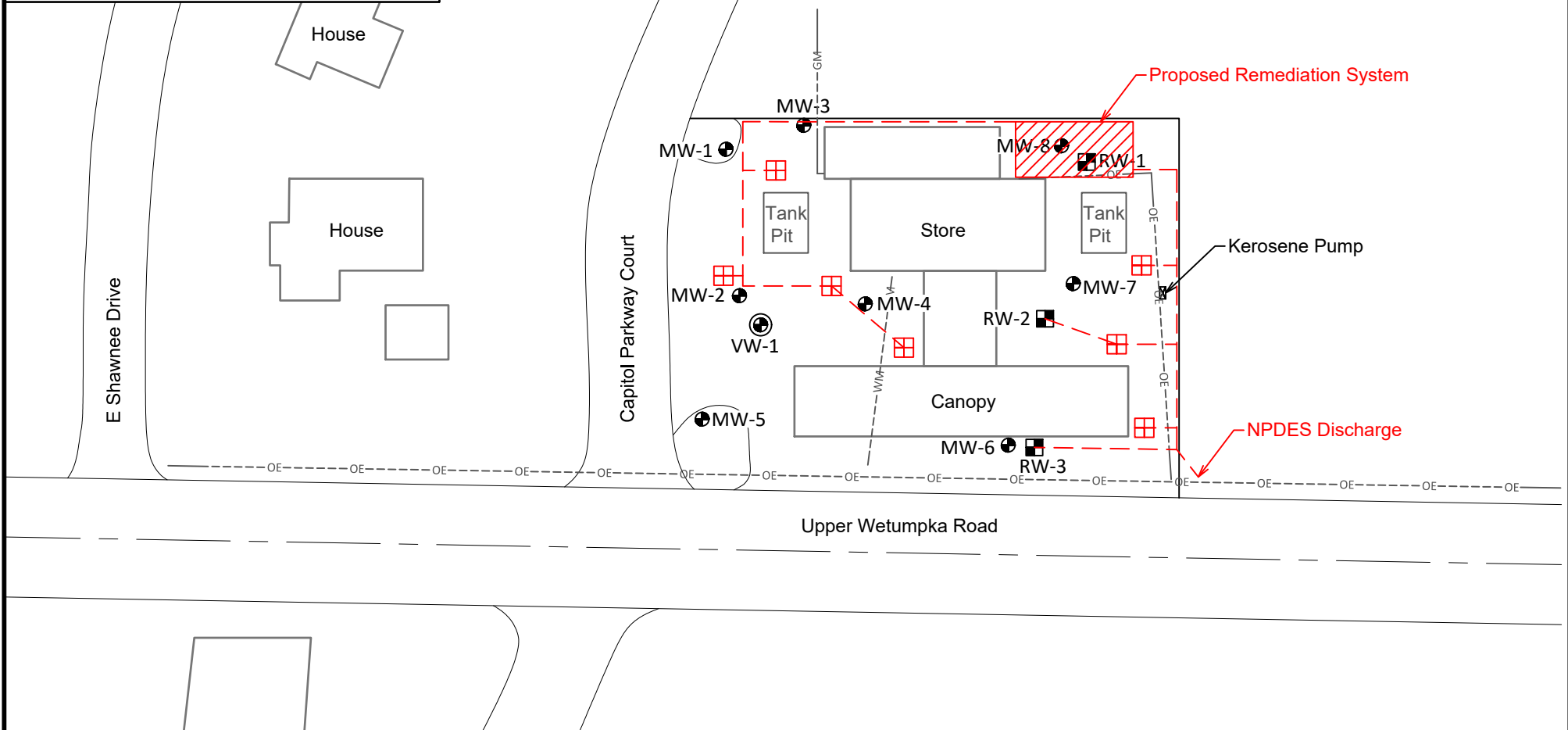
Approximate Scale in Feet



LEGEND

-  Type II Monitoring Well
-  Type III Monitoring Well
-  Recovery Well
-  Proposed Recovery Well
-  Proposed Recovery Well Piping
-  Overhead Electric Cable
-  Gas Line
-  Water Line

Capitol Parkway Shopping Center



Proposed Underground Piping and Recovery Well Network

Capitol Heights Mini Mart
 1705 Upper Wetumpka Road
 Montgomery, Montgomery County, AL



Approximate Scale in Feet



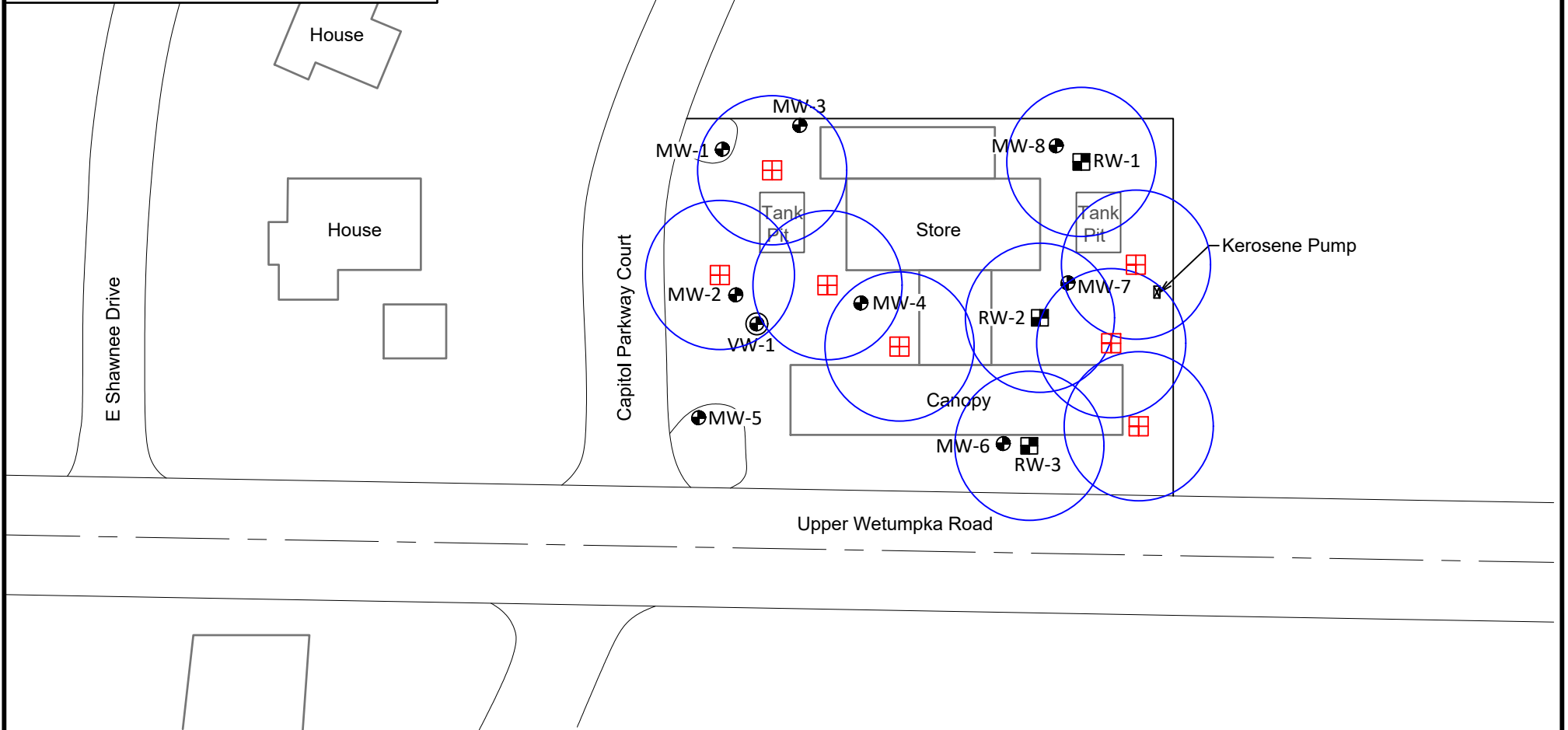
Engineering. Environmental. Answers.
 www.cdge.com

LEGEND

- Type II Monitoring Well
- ⊕ Type III Monitoring Well
- Recovery Well
- ▣ Proposed Recovery Well



Capitol Parkway Shopping Center



Recovery Well Layout with Estimated Radius of Influence



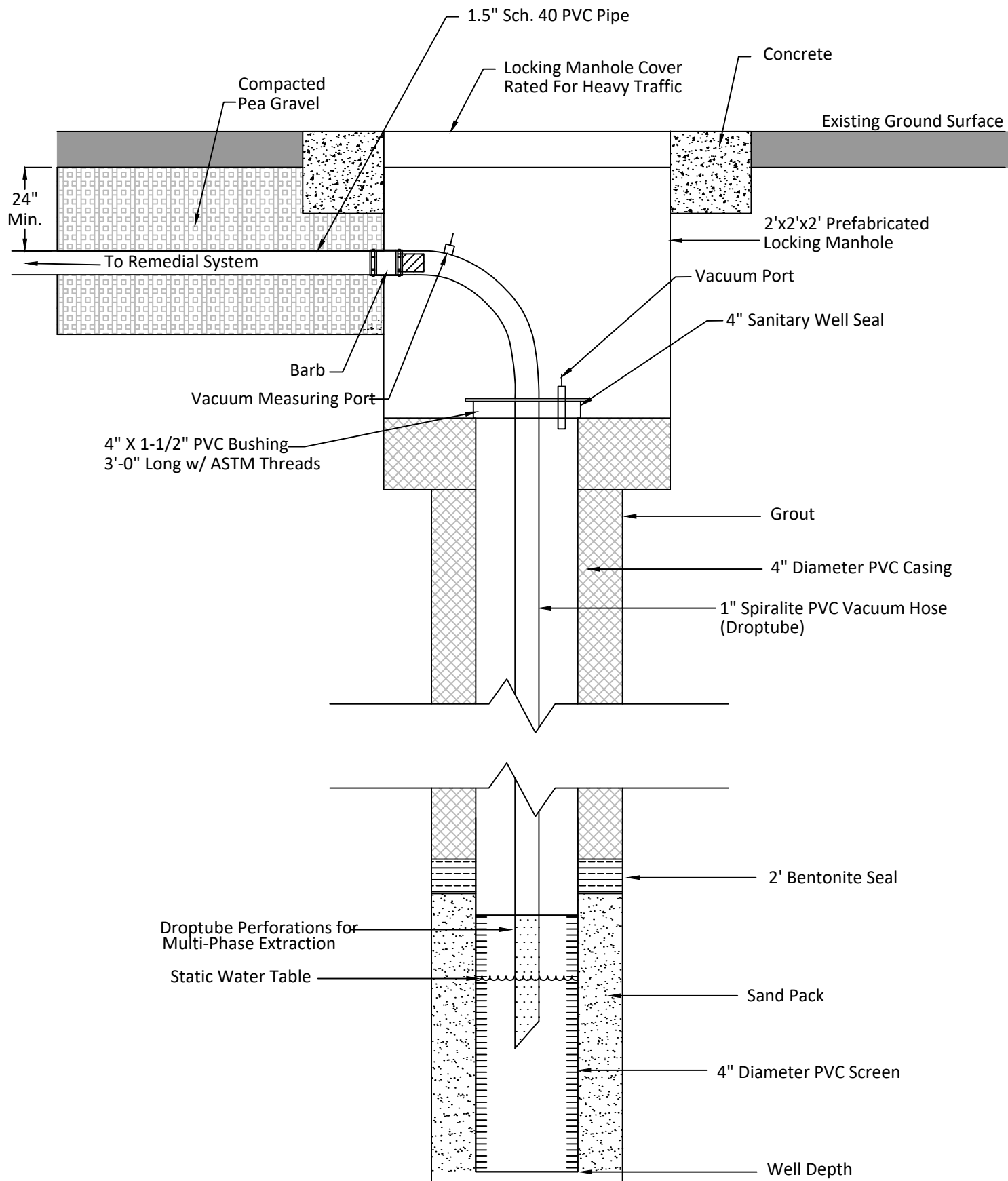
Engineering. Environmental. Answers.
www.cdge.com

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL



Approximate Scale in Feet

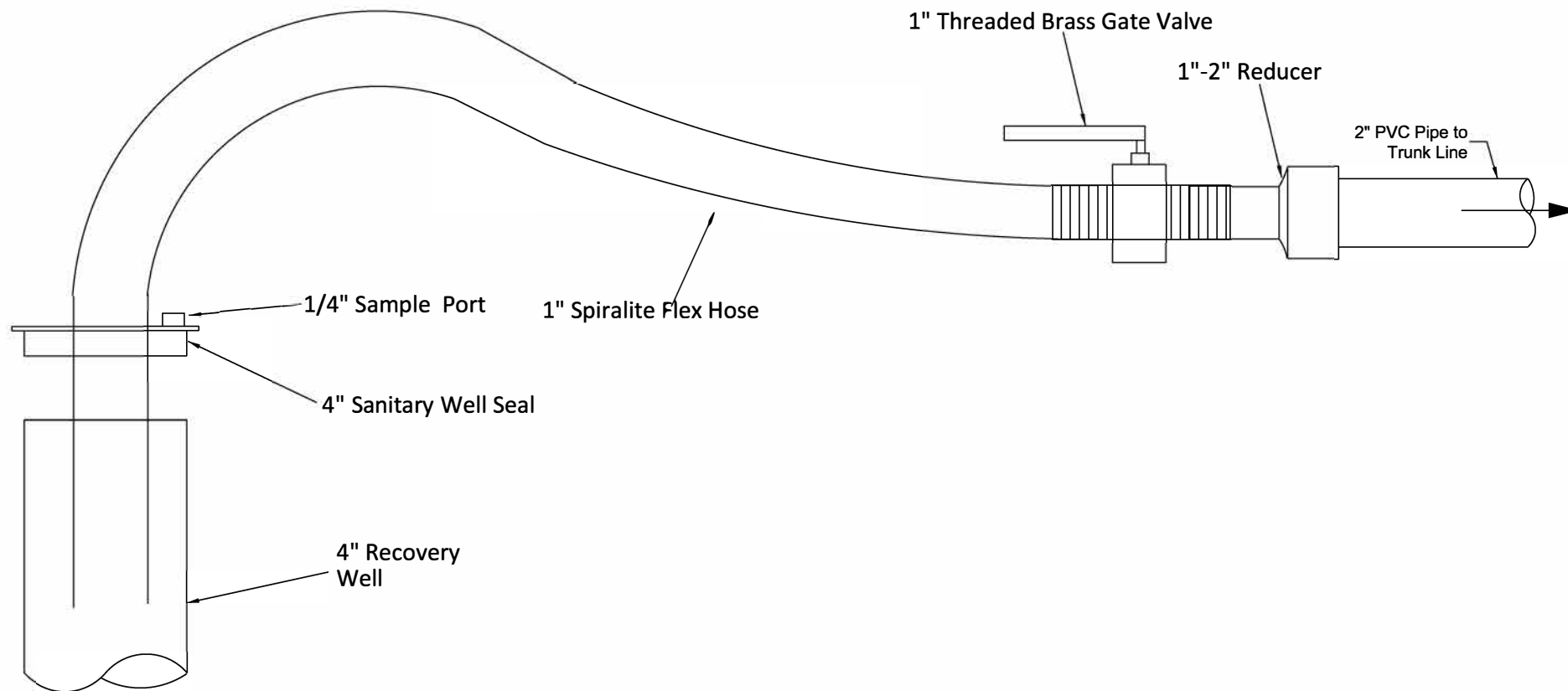




Recovery Well Construction Detail

Capitol Heights Mini Mart
 1705 Upper Wetumpka Road
 Montgomery, Montgomery County, AL

Not to Scale

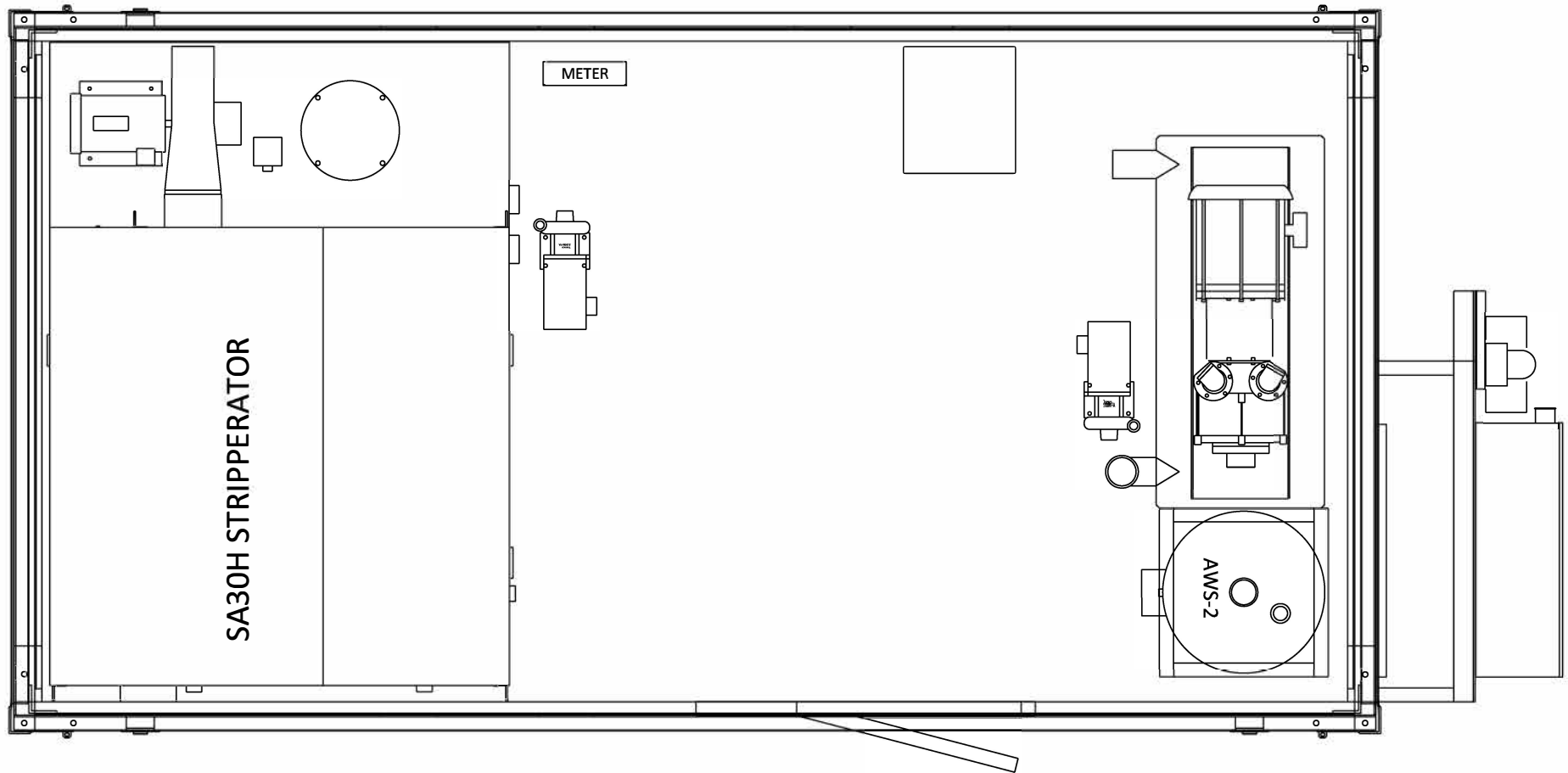


Engineering. Environmental. Answers.
www.cdge.com

Typical Well Head Connection for Recovery Well

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL

NOT TO SCALE



Engineering. Environmental. Answers.
www.cdge.com

Typical MPE System Diagram

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL

NOT TO SCALE



Engineering. Environmental. Answers.

ARBCA Tier 2 SSTLs

ARBCA SUMMARY REPORT

FORM NO. 27

UST Incident No(s): UST17-06-04 Facility ID: 23245-101-006835
 Date Form Completed: 11-Dec-18 Form Completed By: Ann Dyer

TIER 2 GROUNDWATER RESOURCE PROTECTION TARGET CONCENTRATIONS

Distance from source to the point of exposure (POE):	COMPARISON FOR SOURCE SOIL				COMPARISON FOR SOURCE GROUNDWATER				COMPARISON FOR COMPLIANCE WELLS						
	Soil Source Rep. Conc. 1 [mg/kg]	Allowable Soil Conc. 2 [mg/kg]	E/NE	GW Source Rep. Conc. 3 [mg/L]	Allowable GW Conc. at a POC 4 [mg/L]	E/NE	CW Rep. Conc. 5 [mg/L]	Allowable GW Conc. at a POC 6 [mg/L]	E/NE	CW Rep. Conc. 5 [mg/L]	Allowable GW Conc. at a POC 6 [mg/L]	E/NE			
522 feet															
COMPLIANCE WELL NO.	MW-7				MW-7				MW-3						
DISTANCE FROM SOURCE	0 (Source)				0 (Source)				12						
RECENT TREND	sampled once				Fluctuating				Fluctuating						
ORGANICS															
Benzene	5.24	0.533	E	13.4487	0.173	E	1.6762	0.173	E	3.2205	0.173	E	3.1059	0.172	E
Toluene	123	154	NE	40.9231	34.5	E	0.6657	34.5	NE	1.8316	34.5	NE	1.6655	0.345	E
Ethylbenzene	62.2	82.6	NE	4.5707	24.2	NE	0.7597	24.2	NE	0.9511	24.2	NE	0.5177	24.1	NE
Xylenes (Total)	288	96.9	E	23.9335	175	NE	4.5144	175	NE	2.7514	175	NE	3.0893	175	NE
MTBE	0.1	1.45	NE	0.1	0.691	NE	0.0725	0.691	NE	0.6892	0.691	NE	0.0873	0.689	NE
Anthracene															
Benzo(a)anthracene															
Benzo(a)pyrene															
Benzo(b)fluoranthene															
Benzo(g,h,i)perylene															
Benzo(k)fluoranthene															
Chrysene															
Fluoranthene															
Fluorene															
Naphthalene	17.4	15.4	E	0.9579	0.691	E	0.4558	0.691	NE	0.6905	0.691	NE	0.6628	0.689	NE
Phenanthrene															
Pyrene															
METALS															
Arsenic															
Barium															
Cadmium															
Chromium VI															
Lead															
Zinc															

NOTE. Use the ARBCA Computational Software to calculate the allowable (i) soil source conc., (ii) GW source conc., and (iii) compliance well conc.
 1: The soil source representative concentrations have to be calculated and entered here.
 2: Allowable soil concentrations at the source protective of groundwater at the POE.
 3: The groundwater source representative concentrations have to be calculated and entered here.
 4: Allowable groundwater concentrations at the source protective of groundwater at the POE.
 5: Representative concentrations in the compliance well.
 6: Allowable groundwater concentrations at a point of compliance (POC) protective of a POE.
 E: Representative concentration exceeds allowable concentration.
 NE: Representative concentration does not exceed allowable concentration.
 Recommended Attachment: A map showing the location(s) of the soil source(s), location of POE, and location(s) of POC.

ARBCA SUMMARY REPORT

FORM NO. 27

UST Incident No(s): UST17-06-04

Facility ID: 23245-101-006835

Date Form Completed: 11-Dec-18

Form Completed By: Ann Dyer

TIER 2 GROUNDWATER RESOURCE PROTECTION TARGET CONCENTRATIONS

Distance from source to the point of exposure (POE): 522 feet

COMPARISON FOR COMPLIANCE WELLS

CHEMICALS OF CONCERN	CW Rep. Conc. 5 [mg/L]	Allowable GW Conc. at a POC 6 [mg/L]	E/ NE	CW Rep. Conc. 5 [mg/L]	Allowable GW Conc. at a POC 6 [mg/L]	E/ NE	CW Rep. Conc. 5 [mg/L]	Allowable GW Conc. at a POC 6 [mg/L]	E/ NE	CW Rep. Conc. 5 [mg/L]	Allowable GW Conc. at a POC 6 [mg/L]	E/ NE			
COMPLIANCE WELL NO.		MW-4	1	MW-5	31	Fluctuating	MW-6	3	Fluctuating	MW-8	0	Fluctuating	MW-1	17	Fluctuating
DISTANCE FROM SOURCE		522 Fluctuating													
RECENT TREND		Fluctuating													
ORGANICS															
Benzene	8.8054	0.173	E	0.0673	0.67	NE	24.732	0.173	E	13.4487	0.173	E	2.6682	0.173	E
Toluene	6.3294	34.5	NE	0.0198	33.4	NE	53.2555	34.5	E	40.9231	34.5	E	18.8607	34.5	NE
Ethylbenzene	1.6669	24.2	NE	0.0262	23.4	NE	3.1177	24.2	NE	4.5707	24.2	NE	4.6215	24.2	NE
Xylenes (Total)	4.2539	175	NE	0.0362	175	NE	14.4139	175	NE	23.9335	175	NE	23.7568	175	NE
MTBE	0.8801	0.691	E	0.0676	0.667	NE	273.9074	0.691	E	0.1	0.691	NE	0.1	0.691	NE
Anthracene															
Benzo(a)anthracene															
Benzo(a)pyrene															
Benzo(b)fluoranthene															
Benzo(g,h,i)perylene															
Benzo(k)fluoranthene															
Chrysene															
Fluoranthene															
Fluorene															
Naphthalene	0.7483	0.691	E	0.0381	0.667	NE	0.4651	0.691	NE	0.9579	0.691	E	1.0072	0.691	E
Phenanthrene															
Pyrene															
METALS															
Arsenic															
Barium															
Cadmium															
Chromium VI															
Lead															
Zinc															

NOTE: Use the ARBCA Computational Software to calculate the allowable (i) soil source conc., (ii) GW source conc., and (iii) compliance well conc.
 5: Representative concentrations in the compliance well.
 E: Representative concentration exceeds allowable concentration.
 NE: Representative concentration does not exceed allowable concentration.
 Recommended Attachment: A map showing the location(s) of the soil source(s), location of POE, and location(s) of POC.

ARBCA SUMMARY REPORT

FORM NO. 27

UST Incident No(s): UST17-05-05

Facility ID: 24804-003-002304

Date Form Completed: 19-Nov-18

Form Completed By: Ann Dyer

TIER 2 GROUNDWATER RESOURCE PROTECTION TARGET CONCENTRATIONS

Distance from source to the point of exposure (POE): 522 feet

COMPARISON FOR COMPLIANCE WELLS

CHEMICALS OF CONCERN	CW Rep. Conc. 5 [mg/L]	Allowable GW 6 Conc. at a POC [mg/L]	E/ NE	Allowable GW 6 Conc. at a POC [mg/L]	E/ NE	CW Rep. Conc. 5 [mg/L]	Allowable GW 6 Conc. at a POC [mg/L]	E/ NE	CW Rep. Conc. 5 [mg/L]	Allowable GW 6 Conc. at a POC [mg/L]	E/ NE
COMPLIANCE WELL NO.		RW-1		RW-2		RW-3					
DISTANCE FROM SOURCE		10		0		4					
RECENT TREND		Fluctuating		Fluctuating		Fluctuating					
ORGANICS											
Benzene	11.9679	0.173	E	0.173	E	7.2137	0.173	E	5.2455	0.173	E
Toluene	38.8894	34.5	E	34.5	NE	15.938	34.5	NE	17.7849	34.5	NE
Ethylbenzene	3.2565	24.2	NE	24.2	NE	2.1908	24.2	NE	1.981	24.2	NE
Xylenes (Total)	16.8856	175	NE	175	NE	10.8587	175	NE	10.9404	175	NE
MTBE	0.1	0.691	NE	0.691	NE	0.1	0.691	NE	0.1	0.691	NE
Anthracene											
Benzo(a)anthracene											
Benzo(a)pyrene											
Benzo(b)fluoranthene											
Benzo(g,h,i)perylene											
Benzo(k)fluoranthene											
Chrysene											
Fluoranthene											
Fluorene											
Naphthalene	0.6124	0.691	NE	0.691	NE	0.5566	0.691	NE	0.6826	0.691	NE
Phenanthrene											
Pyrene											
METALS											
Arsenic											
Barium											
Cadmium											
Chromium VI											
Lead											
Zinc											

NOTE: Use the ARBCA Computational Software to calculate the allowable (i) soil source conc., (ii) GW source conc., and (iii) compliance well conc.
 5: Representative concentrations in the compliance well.
 6: Allowable groundwater concentrations at a point of compliance (POC) protective of a POE.
 E: Representative concentration exceeds allowable concentration.
 NE: Representative concentration does not exceed allowable concentration.
 Recommended Attachment: A map showing the location(s) of the soil source(s), location of POE, and location(s) of POC.

ARBCA SUMMARY REPORT

FORM NO. 29a

UST Incident No(s): UST17-06-04

Facility ID: 23245-101-006835

Date Form Completed: 11-Dec-18

Form Completed By: Ann Dyer

TIER 2 ON-SITE TARGET LEVELS FOR INHALATION AND INGESTION

NOTE: The SSTLs listed for each route of exposure are the minimum SSTLs for all the receptors for that particular route of exposure. The Tier 2 on-site target levels are the minimum SSTLs of all routes of exposures within each medium.

CHEMICALS OF CONCERN	SURFICIAL SOIL		SUBSURFACE SOIL		GROUNDWATER				
	Outdoor Inhalation, Ingestion, & Dermal Contact [mg/kg]	On-Site Tier 2 Target Levels [mg/kg]	Indoor Inhalation [mg/kg]	Outdoor Inhalation [mg/kg]	On-Site Tier 2 Target Levels [mg/kg]	Indoor Inhalation [mg/L]	Outdoor Inhalation [mg/L]	Ingestion of Water [mg/L]	On-Site Tier 2 Target Levels [mg/L]
ORGANICS									
Benzene	0.387	0.387	67.7	406	67.7	318	1750	NA	318
Toluene	143	143	143	143	143	526	526	NA	526
Ethylbenzene	51.5	51.5	51.5	51.5	51.5	169	169	NA	169
Xylenes (Total)	57.1	57.1	57.1	57.1	57.1	175	175	NA	175
MTBE	377	377	0.518	974	0.518	48000	48000	NA	48000
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	24.5	24.5	24.5	24.5	24.5	31	31	NA	31
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTE:
NA: Not Available

ARBCA SUMMARY REPORT

FORM NO. 29b

UST Incident No(s): UST17-06-04

Facility ID: 23245-101-006835

Date Form Completed: 11-Dec-18

Form Completed By: Ann Dyer

TIER 2 OFF-SITE TARGET LEVELS FOR INHALATION AND INGESTION

NOTE: The SSTLs listed for each route of exposure are the minimum SSTLs for all the receptors for that particular route of exposure. The Tier 2 off-site target levels are the minimum SSTLs of all routes of exposures within each medium.

CHEMICALS OF CONCERN	SURFICIAL SOIL		SUBSURFACE SOIL			GROUNDWATER			
	Outdoor Inhalation, Ingestion, & Dermal Contact [mg/kg]	Off-Site Tier 2 Target Levels [mg/kg]	Indoor Inhalation [mg/kg]	Outdoor Inhalation [mg/kg]	Off-Site Tier 2 Target Levels [mg/kg]	Indoor Inhalation [mg/L]	Outdoor Inhalation [mg/L]	Ingestion of Water [mg/L]	Off-Site Tier 2 Target Levels [mg/L]
ORGANICS									
Benzene	0.387	0.387	10.3	406	10.3	48.5	1750	NA	48.5
Toluene	143	143	143	143	143	526	526	NA	526
Ethylbenzene	51.5	51.5	51.5	51.5	51.5	169	169	NA	169
Xylenes (Total)	57.1	57.1	57.1	57.1	57.1	175	175	NA	175
MtBE	94.6	94.6	0.518	974	0.518	40900	48000	NA	40900
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	24.5	24.5	24.5	24.5	24.5	31	31	NA	31
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTE:
NA: Not Available



Engineering. Environmental. Answers.

Calculations

Estimated Time Required for Ground Water Clean Up Using SSTLs

Will estimate time required for clean up of ground water contaminants in general accordance with methods presented in "Analysis of Ground-Water Remedial Alternatives at a Superfund Site", by Zheng and others, 1991 and "Discussion of Papers", by McAleb, Zhenb and others, 1992

Approach: estimate the number of pore volumes (ground water) required to remove existing benzene concentration to alternate corrective action level. If free product is present on-site, will assume COC concentrations to be equivalent to effective solubility values

Constituent	Maximum Value (mg/l)
Benzene	31.7
Toluene	64.5
Ethylbenzene	2.72
Xylenes	10.1
MTBE	547

Soil physical property data collected from Shelby Tube Samples in February 2017.

dry bulk density	P_b	1.731	g / cm ³
organic carbon	f_{OC}	0.0005	g _C / g _S
porosity	N	0.374	-
water content	wc	0.342	cm ³ / cm ³
Air content	ac	0.032	cm ³ / cm ³

Physiochemical properties of constituents

Constituent	MW (g/mole)	Log k_{ow} (-)	K_{oc} (-)
Benzene	78.1	2.13	85
Toluene	92.1	2.73	338
Ethylbenzene	106.2	3.15	890
Xylenes	106.2	3.00	630
MTBE	88.2	1.10	8

where: MW= molecular weight, grams/mole
 K_{ow} = organic water partition coefficient, dimensionless
 K_{oc} = 0.63 * K_{ow}

Target values: based on SSTLs calculated in ARBCA Evaluation (December 2018)

Constituent	Target Levels (mg/l)
Benzene	0.173
Toluene	34.5
Ethylbenzene	24.2
Xylenes	175
MTBE	0.691

Estimate Time Required for Ground Water Clean Up Using SSTLs

$$PV = \frac{-1}{\ln [1 + (n/p_b K_{oc} f_{oc})]} \ln(C_s / C_i)$$

Where: PV= pore volume
 C_s= target level
 C_i= initial value

Constituent	Pore Volume
Benzene	2.89
Toluene	NA
Ethylbenzene	NA
Xylenes	NA
MTBE	NA

Estimated areal extent of the onsite contamination is 30,400 ft² and the contamination zone is estimated to be approximately 10 feet, based on seasonal variations observed in ground-water levels.

Estimate clean up time using the formula:

$$t_c = PV \times t_{pv}$$

where: t_c= clean up time
 t_{pv}= time required for movement of one pore volume of clean water through the attainment area

Volume of one pore volume: 304,000 ft³ x 7.48 gal/ ft³ x n= 850,446 gal
 Pumping rate: 2.0 gpm (assuming 90% run time 1,419,120 gal/year)

$$t_c = 2.89 * (850,446 \text{ gal} / 1,419,120 \text{ gal/year}) = 1.73 \text{ years}$$



Engineering. Environmental. Answers.

Equipment Specifications

MK ENVIRONMENTAL INC.

765 Springer Drive
 Lombard, IL. 60148-6412
 615-392-7737 (direct)

igiltz@mkenv.com

QUOTATION

Date 4/11/2019
 Quote No. 219016
 Reference Capitol Heights
 Page No. 1 of 4
 Freight Included
 Terms PWP Net 180
 Ship Via FLATBED
 F.O.B. Factory

SOLD TO:	SHIP TO:
David Dailey CDG Engineers & Associates, Inc. 3 Riverchase Ridge Hoover, AL. 35244 PH: (205) 403-2600	Capitol Heights Montgomery, AL. Attn: Brooks Hamilton

Quotation valid for 60 days

QUANTITY		UNIT PRICE	AMOUNT
	400 amp 3/60/230 volt 4 wire plus ground electrical service Brought to NEMA 3R control Panel Interior electrical will comply with NEC requirements for Class 1, Division 2, Group D Hazardous locations Motors will be TEFC construction		
1	40.0 HP single stage oil sealed liquid ring blower 490 ACFM @ 20"Hg. Capacity 3/60/230-460 volt, TEFC motor Direct drive motor Oil Scavenge line Backpressure gauge Multistage filtration system allows operation over the full range of vacuums, Temperature gauge Y strainer with clean out plug High temperature switch low and high oil level switches inlet filter inlet check valve Includes extra 5 gallon bucket of replacement seal oil LRP heat exchanger recirculation sound box with hardware	41,048.00	\$41,048.00
1	190 gallon Air/water separator with conductivity probe level switches 10" diameter clean out ports with vacuum rated quick release lid Clear PVC sight glass piping to liquid ring pump, to check for water carryover Liquid filled vacuum gauge Vacuum assist hose 2" drain valves Vacuum relief valve Dilution valve with filter/silencer Inlet screen		
1	1.5 hp transfer pump, 3450 rpm, TEFC motor Cast Iron housing with composite impeller, anti air lock design manual "Pump ON" button inside building for sampling		
1	7-Point dual phase inlet manifold inside system building including 4" main x (10) 2" branches, each branch includes; 2" throttling valve, vacuum gauge, 6" section of clear pvc site tube with quick Fernco disconnect 100' of bulk 2" clear tiger flex hose for stub up connection by others		
1	MKE Model SA15B STRIPPERATOR 15 GPM oil/water Separator and Air stripper treatment system Coalescing separator with skimming weir and water sump tank Low profile air stripping system with nylon aeration tubes and dual pattern diffusers 2.0 HP aluminum blower, AMCA B rated spark resistant Air pressure gauge Intrinsically safe high-high sump level and low blower pressure alarm switches Stainless steel construction Blower silencer	16,377.00	\$16,377.00
1	1.5 hp transfer pump, 3450 rpm, TEFC motor Cast Iron housing with composite impeller, anti air lock design manual "Pump ON" button inside building for sampling		
1	Groundwater flow totalizer with pulse output for remote totalization Flow calibration button		

MK ENVIRONMENTAL INC.

David Dailey
 CDG Engineers & Associates, Inc.

Date 4/11/2019
 Quote No. 219016
 Reference Capitol Heights
 Page No. 2 of 4

QUANTITY		UNIT PRICE	AMOUNT
1	Master Control Panel System, Including: NEMA 3R control panel with blank front cover Swing out sub panel for gauges, control operators, and switches IEC Magnetic motor starters, safety switches, H-O-A controls Control transformer (8) intrinsically safe relays, (8) alarm indicator LED's, (16) output channels Hard wired relay logic (1) exterior GFCI utility outlet System run time totalizing hour meter Blower low pressure alarm Anti-falsing alarm circuit to prevent nuisance tripping Auto-release restart timer for remote restarts via telemetry Three phase voltage and phase monitor Emergency E-stop LED red indicator light located on swing out sub panel <u>Liquid ring automatic shut down upon:</u> AWS1 high liquid level Oil reservoir tank low and high level alarms Liquid ring High temperature alarm Air stripper blower low pressure Air stripper sump High liquid level alarm Phase fault condition Interior Emergency Stop Mushroom button with twist to release detent Oxidizer interlock controls	19,433.00	\$19,433.00
1	Fused Main Disconnect system for liquid ring and oxidizer Includes: (1) 200 amp disconnect box for LRP & (1) 100 amp disconnect box for 300E. (1) Weatherhead with extension pole and bracket support (1) 400 amp Electric meter socket base installed		
1	FleetZOOM FZ300 Cellular Wireless Monitoring Unit. 14 Digital Inputs, 4 Digital Outputs, 2 Analog Input plus internal temperature and DC power monitoring. Includes: Cellular antenna, wiring diagrams, setup forms. Web based monitoring capabilities with graphing and data export. Email & SMS alarming capabilities. One full year of service starting at time of installation. Real Time Alarm Monitoring & Notification, Real Time Status Monitoring. Maximum of 500 alarm or status change events per month, plus sampling of all signals, transmitted every 60 minutes. Annual renewal service invoiced at end of each year, due Jan of following year. Renewal: \$420/yr per unit, BY OTHERS. (subject to change)		
1	Vacuum transducer integrated into telemetry system for real time monitoring, 4-20mA		
1	System building 8.5'W x 12'L x 9.5'H aluminum/steel enclosure, fully insulated with Removable sliding wall panels for ease of maintenance Exterior grade plywood floor, structural steel frame Includes 100 watt XP interior light, and removable center grate for ease of maintenance The breaker panel and control panel will be mounted on a vertical steel bracket attached to platform end. The bracket, panels and all conduits will allow for the removal of the enclosure panels by one person. 10" structural steel base with 4" steel cross members Steel corner posts and roof frame Continuous sheet aluminum roof for superior protection	26,221.00	\$26,221.00

MK ENVIRONMENTAL INC.

David Dailey
 CDG Engineers & Associates, Inc.

Date 4/11/2019
 Quote No. 219016
 Reference Capitol Heigh
 Page No. 3 of 4

QUANTITY		UNIT PRICE	AMOUNT
1	12,000 BTU XP heater with XP thermostat. All components fully piped, wired and factory tested		
1	Equipment Electrical Installation Includes XP wiring, XP seal off connectors, liquid tight flexible conduit UL listed equipment.		
1	Equipment Mechanical Installation Includes mounting, piping and connectors Brass fittings, sample ports, pressure gauges and sight glasses		
1	Third Party MET Certification The entire remediation building to be third party certified at MK Environmental factory. National Recognized Testing Lab (NRL)		
1	Startup & Training Services 2-day remediation system and catalytic oxidizer rental startup & training services. Based on 2 weeks prior notice.	3,000.00	\$3,000.00
1	Freight Services Remediation system building freight to jobsite. Off loading and placement by others.	2,500.00	\$2,500.00

Does not include permits, fees, etc...
 Offloading & placement by others.

Jerry Giltz,
 MK ENVIRONMENTAL, INC.

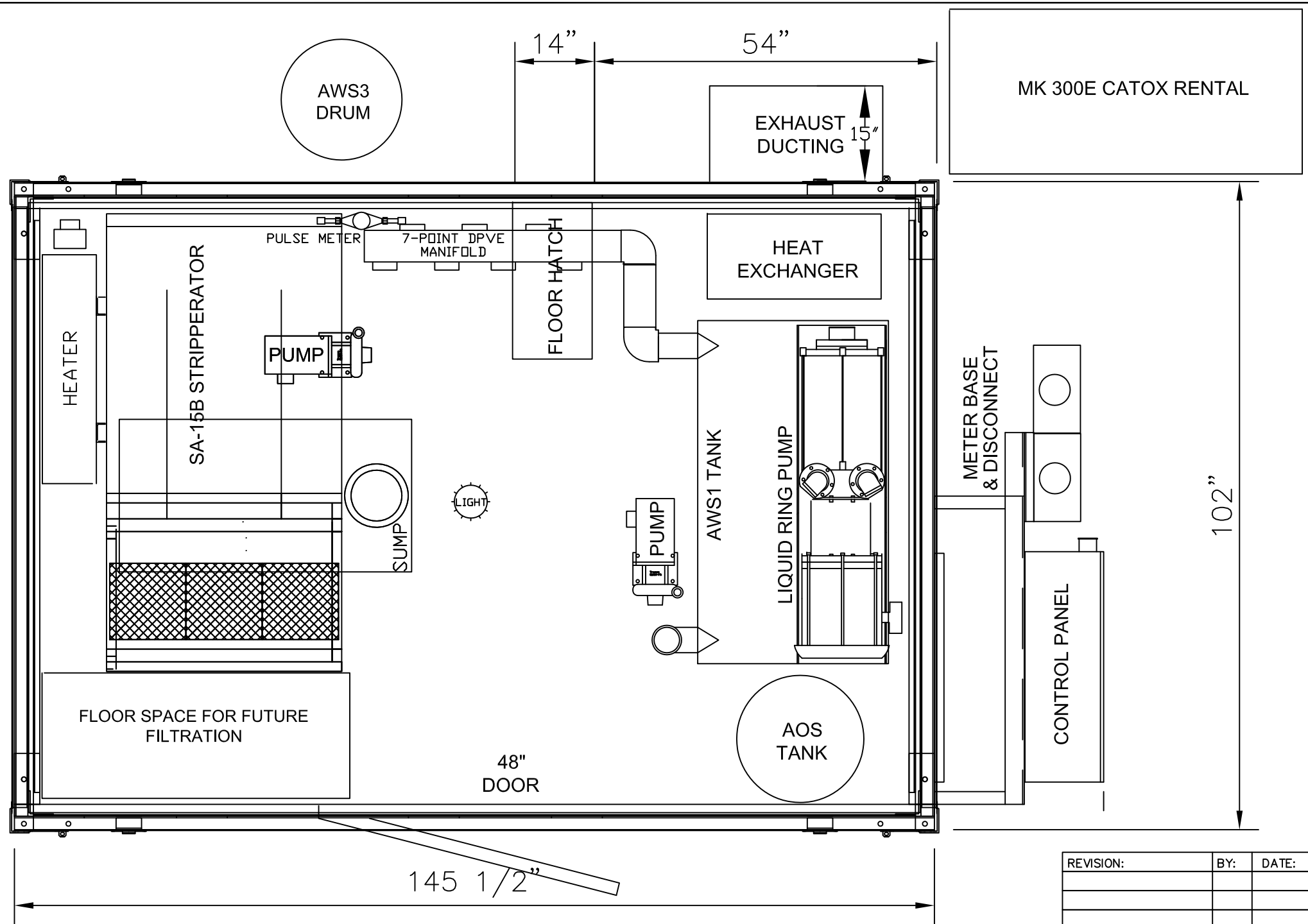
EQUIP. SUB TOTAL	\$108,579.00
EQUIP. SALES TAX	
START UP/TRAINING	
FREIGHT	
NET TOTAL	\$108,579.00

			AMOUNT
<u>MK Offgas Treatment Page: (Add to the Net Total)</u>			
6	Month minimum rental of the Catalytic oxidizer unit, 300 SCFM capacity Electric oxidizer provided, based on availability at time of order. Month to month rental until the CDG notifies MK they are done with the oxidizer rental.	4,000.00	\$24,000.00
1	MK rental oxidizer freight (before and after rental) Freight to site, off loading by others Return freight to MK factory after rental in completed, on loading & supervision by others	5,000.00	\$5,000.00
1	AWS3 knock out tank prior to oxidizer to minimize condensed liquids from entering burner or vapor phase carbon bed.	950.00	\$950.00
 Note:			
1. Please allow up tp 2 weeks after power is installed for MK startup and training to be preformed.			
2. Oxidizer power terminations and interlock conduits w/wires will require to be ran prior to MK startup services. MK will provide a detailed wiring and conduit schedule.			
3. MK allows up to 2 weeks after the oxidizer rental ship date before starting the rental clock to allow for power hook-ups.			
4. Oxidizer rental contact may apply.			

Does not include permits, fees, etc...
 Offloading & placement by others.

Jerry Giltz,
 MK ENVIRONMENTAL, INC.

EQUIP. SUB TOTAL	\$29,950.00
EQUIP. SALES TAX	
START UP/TRAINING	Included
FREIGHT	Included
NET TOTAL	\$29,950.00



REVISION:	BY:	DATE:



DATE:
4-11-19

DRAWN BY:
JAG

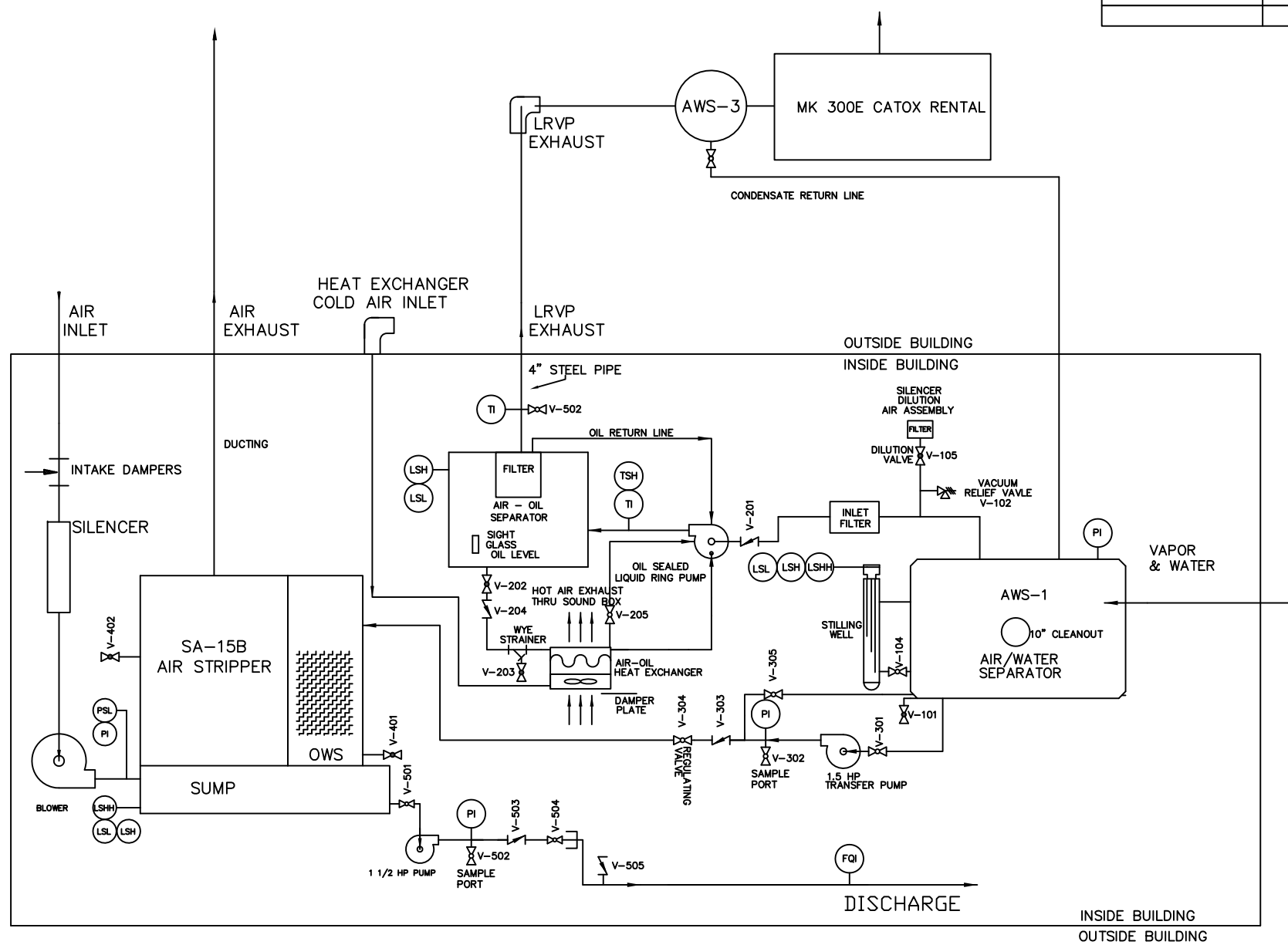
JOB NUMBER
219016

FACILITY ID/TAG#

DRAWING NUMBER

CDG ENG.
CAPITOL HEIGHTS; MONTGOMERY, AL

REVISION:	BY:	DATE:



LABEL	DESCRIPTION	VALVE TYPE	LABEL	DESCRIPTION	VALVE TYPE	LABEL	DESCRIPTION	VALVE TYPE	LABEL	DESCRIPTION	VALVE TYPE	LABEL	DESCRIPTION	VALVE TYPE
V-101	AWS-1 DRAIN	1" BALL VALVE	V-201	AIR/OIL FLOW CHECK	4" CHECK VALVE	V-301	AWS-1 PUMP ON/OFF	1-1/4" BALL VALVE	V-401	OWS DRAIN	1" BALL VALVE	V-501	SUMP PUMP ON/OFF	1-1/4" BALL VALVE
V-102	VACUUM RELIEF	2" VACUUM RELIEF	V-202	SEAL OIL ON/OFF	4" BUTTERFLY	V-302	INFLUENT SAMPLE PORT	1/4" BALL VALVE	V-402	AIR STRIPPER DRAIN	1" BALL VALVE	V-502	EFFLUENT SAMPLE PORT	1/4" BALL VALVE
V-103		1/4" BALL VALVE	V-203	1/2" SEAL OIL DRAIN	1/2" BALL VALVE	V-303	AWS-1 CHECK VALVE	1" BALL CHECK				V-503	SUMP CHECK VALVE	1" BALL CHECK
V-104	STILLING WELL ON/OFF	1" GATE VALVE	V-204	SEAL OIL CHECK VALVE	1" SWING CHECK	V-304	AWS-1 FLOW REGULATOR	1" BALL CHECK				V-504	SUMP FLOW REGULATOR	1" BALL VALVE
V-105	DILUTION VALVE	2" BALL VALVE	V-205	SEAL OIL VENT VALVE	1/4" BALL VALVE	V-305	AWS-1 RECIRCULATION	1/2" BALL VALVE				V-505	ANTI-SIPHON VALVE	3/4" VAC RELIEF

V VACUUM
 P PRESSURE
 S SWITCH
 L LIQUID LEVEL OR LOW T
 I INDICATOR
 FQI FLOW QTY IND. (TOTALIZER)
 FRI FLOW RATE INDICATOR
 T TEMPERATURE



DATE: 4-11-19
 DRAWN BY: JAG
 JOB NUMBER: 219016
 FACILITY ID/TAG#

DRAWING NUMBER
 CDG ENG.
 CAPITOL HEIGHTS; MONTGOMERY, AL



Environmental Inc.

MK Environmental Inc.
7150 S. Madison Street
Willowbrook, IL. 60527
630-920-1104 Phone
630-920-8013 Fax

MK ON-SITE REMEDIATION EQUIPMENT



SYSTEM DESCRIPTION

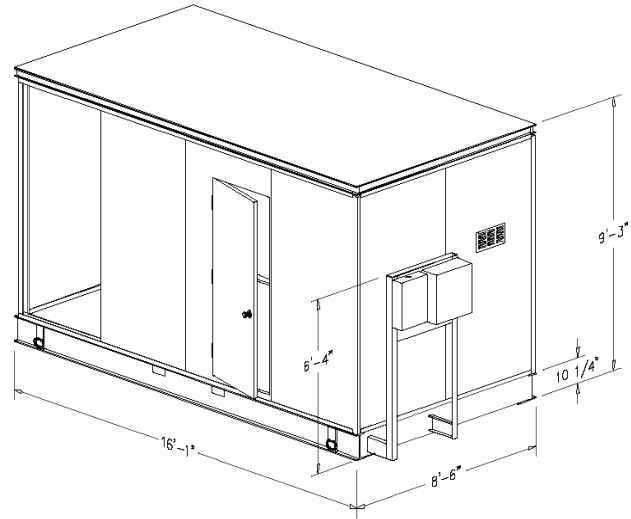
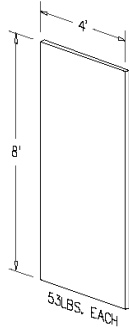
MK Environmental is your single source manufacturer for all your remediation needs. Designed to save time, space and money - Engineering for maximum UPTIME. All the room needed for maintenance, without taking up a lot of room.

- All equipment fully piped, wired and tested
- Completely Integrated remediation system
- Factory built equipment stand alone building
- Structural steel construction with aluminum exterior for low maintenance
- Removable sliding wall panels; fully insulated and faced inside and out with aluminum sheeting
- All panels removable for full accessibility and maintenance to all equipment within
- MK Environmental manufactures all process components
- Dimensions: 8, 12, 16, 20, 24 or 28' long x 8.5' wide x 9.5' high
- Off gas treatment with oxidizer or carbon for purchase or rent

MK ENVIRONMENTAL ON-SITE PLATFORM

INSULATED, REMOVABLE WALL PANELS

TYPICAL OF AN 8' X 16' PLATFORM.
OTHER SIZES AVAILABLE.



MK Building Specifications:

- 10" structural steel I beam base, 4" steel corner posts, 2" steel roof frame
- 100 MPH rated construction. PE stamped design. 150 MPH available
- Roof constructed of a single sheet of aluminum for watertight construction
- Roof and walls are insulated with minimum 1.5" urethane insulation (R10)
- Removable 4' x 8' sliding aluminum wall panels (53 lbs/ea) for ease of maintenance
- Class 1, Division 2, Group D XP electrical interior
- 3/4" plywood flooring with I beams on 12" centers
- Man door and 100 watt interior explosion-proof light fixture is standard
- White interior and exterior
- Single source for equipment, service and support

Optional Building Features:

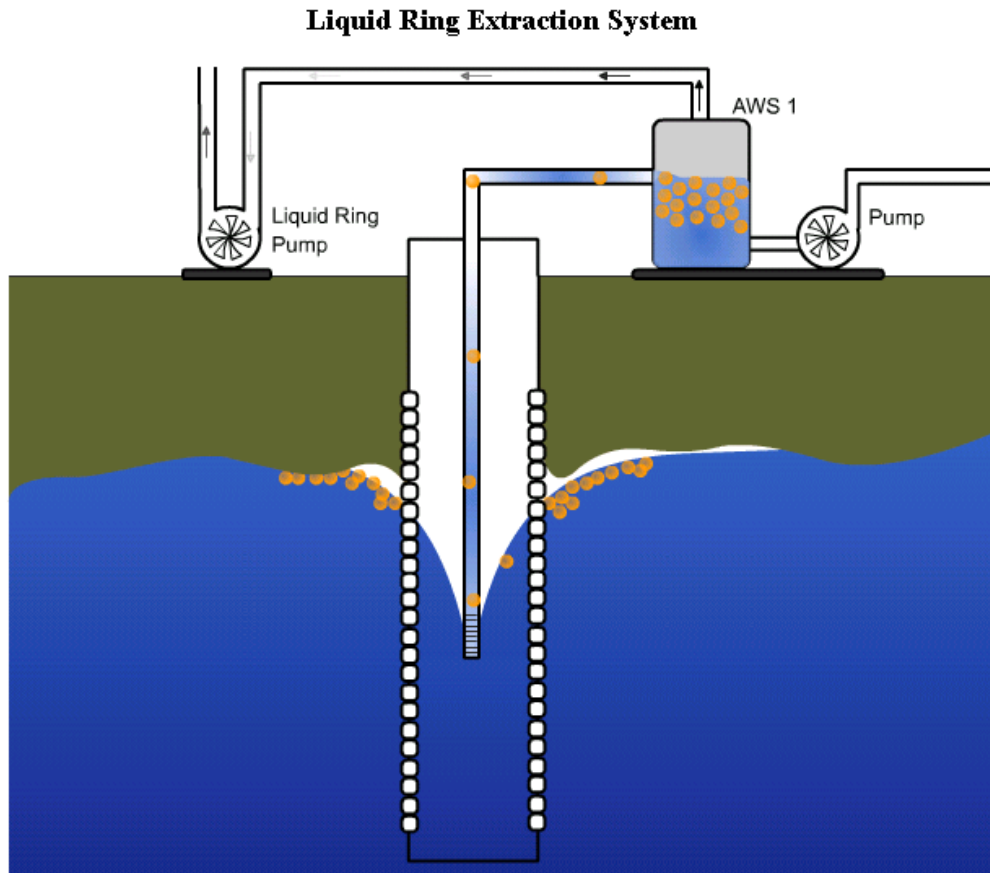
- Flatbed trailer mount building (enclosed)
- XP heater with thermostat
- XP ventilation fan
- Noise Issues: *Sound insulation packages*
- Factory installed fused main disconnect, meter base and weatherhead
- Factory UL listed control panel & entire MK buildings by MET Labs (NRTL)



MK Environmental Inc.
7150 S. Madison Street
Willowbrook, IL. 60527
630-920-1104 Phone
630-920-8013 Fax

Environmental Inc.

OIL SEAL DUAL EXTRACTION SYSTEM



HOW IT WORKS

Dual extraction is a method by which both groundwater and vapors can be extracted from the same well with a single vacuum pump located in the equipment compound. The recovered groundwater is then typically treated with an oil/water separator and air stripper, and the air discharged to atmosphere. The typical limit for dual extraction is from wells less than 25' deep. Extraction from deeper wells is possible, but requires some additional fittings. Most systems utilize a liquid ring vacuum pump as the vacuum source because they can achieve the high levels of vacuum required, typically 18-22 inches of mercury.

Oil Seal Dual Extraction System Continue

In most dual extraction systems, a high vacuum is applied to a suction tube placed down an extraction well, below the static groundwater table, with the bottom end of the tube at the elevation in which draw down is desired. The top of the well casing is sealed to atmosphere. The vacuum applied to the tube then begins to extract the groundwater from the well until the well is drawn down and the water surface in the well reaches the bottom of the tube. At this point, the tube "breaks suction" and begins to apply the vacuum to the air space in the well and surrounding soil. As additional groundwater flows into the well, it is sucked up the tube until it again breaks suction. This process then continues indefinitely, with alternating slugs of groundwater and vapors pulled up the suction tube, out of the well and on to the process equipment. The extracted vapors and groundwater then flow through piping from the well to the first Air/Water Separator, AWS1. There, the liquids, groundwater and product are separated from the vapors by cyclonic action. The liquid flows into a sump where it is then pumped to the oil/water separator and air stripper for treatment. The contaminated vapors continue on into the liquid ring vacuum pump. It is then discharged, under pressure, out of the liquid ring pump to atmosphere.

MK Environmental Inc.

7150 S. Madison Street, Willowbrook, IL. 60527

630-920-1104

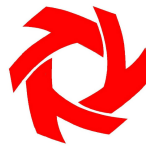
630-920-8013 fax

mkenv.com

DIAGRAMMA DI FUNZIONAMENTO
Performance curves

POMPA PER VUOTO AD ANELLO DI LIQUIDO
Liquid ring vacuum pump

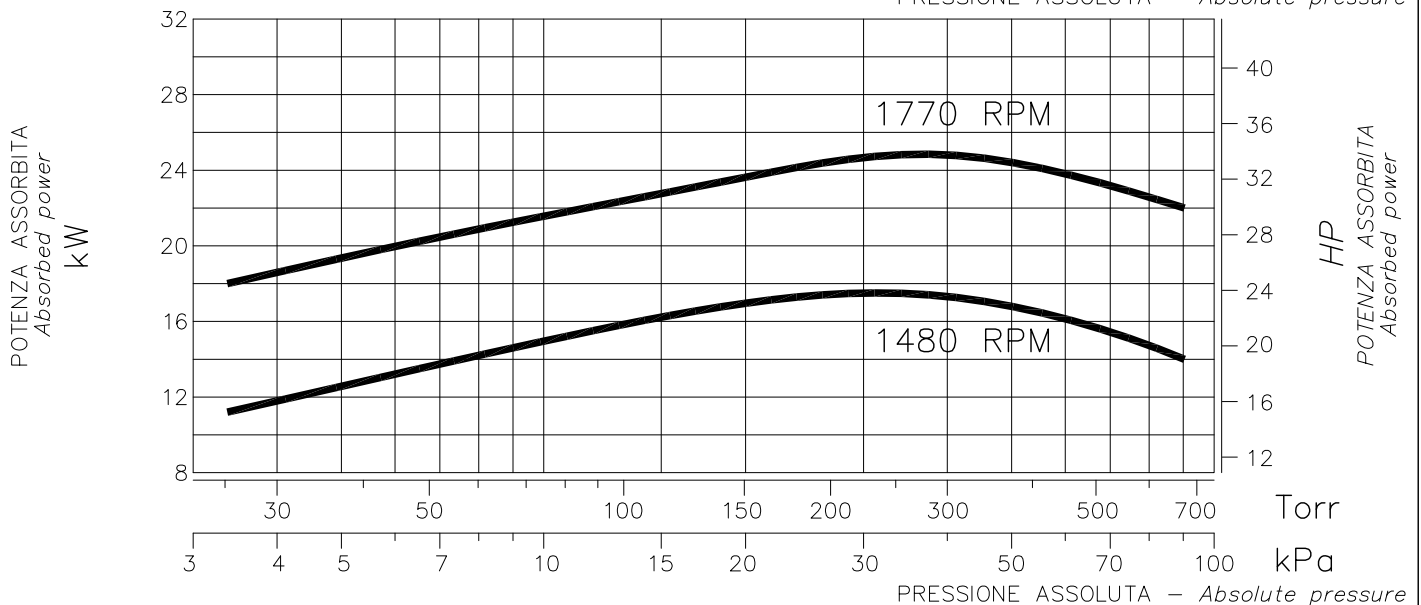
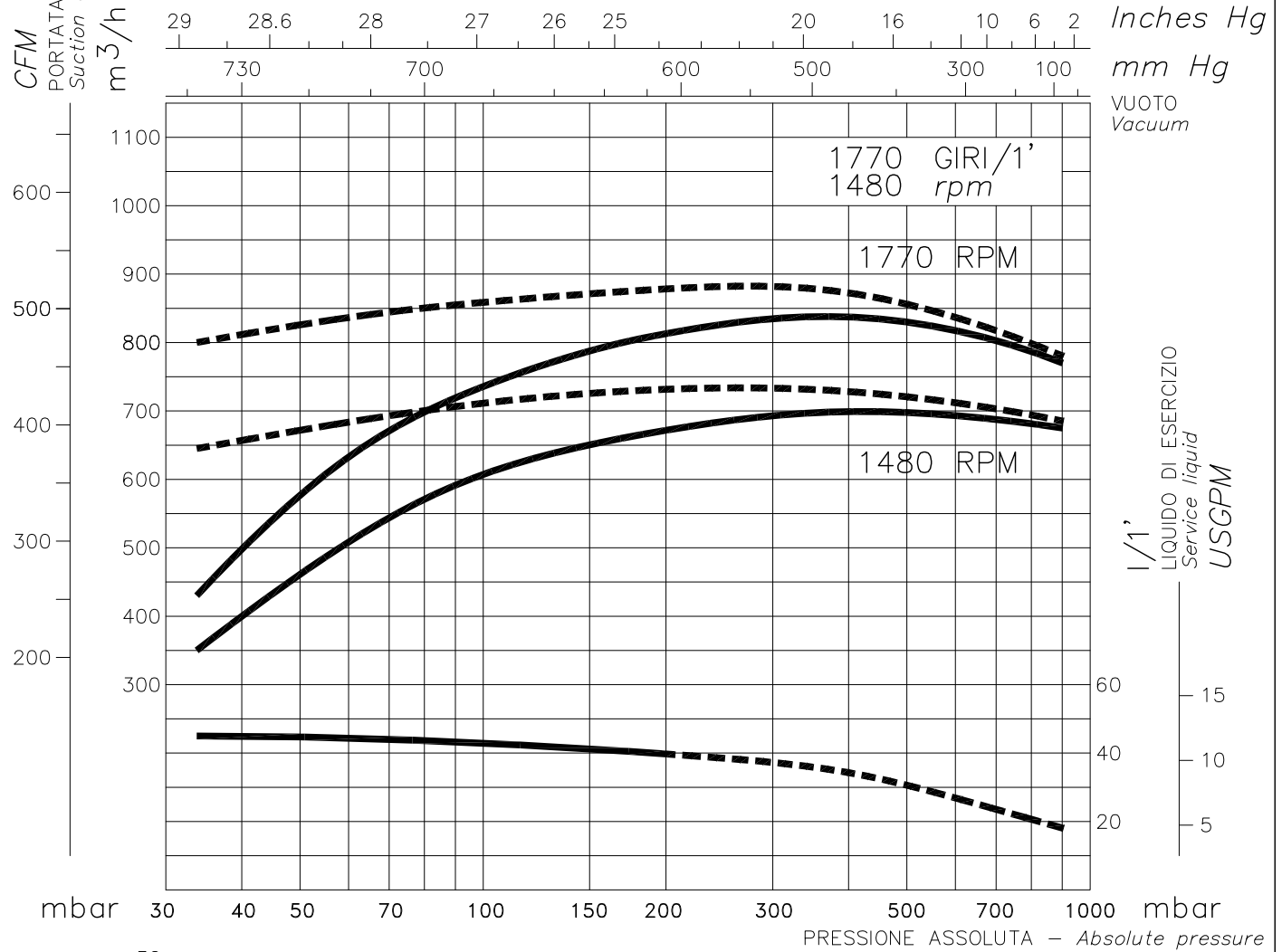
TIPO **TRVX 1005**
Type



**TRAVAINI
PUMPS USA**
Liquid Ring & Rotary Vane Vacuum Pumps and Systems

200 Newsome Drive
Yorktown, VA 23693
1-800-535-4243
www.Travaini.com

I DATI RIPORTATI SONO RIFERITI A - Data refers to :
 ARIA SECCA A 20 °C — Dry air at 20 °C (68 °F)
 ARIA SATURA A 20 °C — Saturated air at 20 °C (68 °F)
 LIQUIDO DI ESERCIZIO ACQUA — Water Service liquid
 TEMPERATURA LIQUIDO DI ESERCIZIO 15 °C — (59 °F) Service liquid temperature
 PRESSIONE DI SCARICO 1013 mbar Discharge pressure
 TOLLERANZE 10% Tolerance
 PORTATA PER COSTR. IN ACC. INOX -10% Capacity for S.S. construction





Environmental Inc.

**MK Environmental Inc.
7150 S. Madison Street
Willowbrook, IL. 60527
630-920-1104 Phone
630-920-8013 Fax**

STRIPPERATOR SA15B



The Strippertor SA15B is a complete process treatment unit for hydrocarbon-contaminated water. It integrates both coalescing oil/water separator and the Cascade low profile Air Stripper into one component. The unit will separate free product, coalesce suspended hydrocarbons and settle solids.

- Integrates a coalescing oil/water separator and cascade low profile air stripper and effluent sump into a single component (3 tanks built into 1)
- Gravity flow from oil/water separator to the air stripper (NO PUMP REQUIRED)
- Fully gasketed lids with quick release adjustable latches
- Small footprint 37"W X 71"L X 37" H
- 304 Stainless Steel construction
- Fits through a double door – minimal space required
- Easy access to separator and air stripper as well as simple to maintain
- Allows quick inspection and viewing of operation
- 15 GPM capacity

CT Series

High Pressure Centrifugal Pumps
 $\frac{1}{2}$ - 2 $\frac{1}{2}$ HP
 Heads to 140 Feet
 Capacities to 95 GPM



MYERS CT SERIES LINE OF HIGH PRESSURE CENTRIFUGAL PUMPS PROVIDES QUALITY AT A COMPETITIVE PRICE. The complete line of $\frac{1}{2}$ to 2 $\frac{1}{2}$ HP units provide strong pressures up to 140 feet and flows up to 95 gpm.

The rugged cast iron body construction is available with either a corrosion resistant composite or brass impeller. The brass impeller unit is equipped with a high temperature, viton seal for more demanding applications. The heavy duty motor features a double ball bearing, 50° C ambient, dual voltage design for dependable service. The compact, back pullout design provides easy installation and serviceability.

The quality features of the CT series will provide dependable service for a wide variety of applications.

SPECIFICATIONS

HP	Catalog No.		Pipe Tapping Sizes		Motor Voltage	Phase	Approx. Wt. Lbs.
	Composite Impeller	Brass Impeller	Suction (NPT)	Discharge (NPT)			
$\frac{1}{2}$	CT05	CT05B	1 $\frac{1}{4}$ "	1"	115/230	1	30
	CT053	CT05B3	1 $\frac{1}{4}$ "	1"	208/230/460	3	30
$\frac{3}{4}$	CT07	CT07B	1 $\frac{1}{4}$ "	1"	115/230	1	32
	CT073	CT07B3	1 $\frac{1}{4}$ "	1"	208/230/460	3	32
1	CT10	CT10B	1 $\frac{1}{2}$ "	1"	115/230	1	35
	CT103	CT10B3	1 $\frac{1}{2}$ "	1"	208/230/460	3	35
1 $\frac{1}{2}$	CT15	CT15B	1 $\frac{1}{2}$ "	1"	115/230	1	40
	CT153	CT15B3	1 $\frac{1}{2}$ "	1"	208/230/460	3	40
2	CT20	CT20B	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	115/230	1	57
	CT203	CT20B3	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	208/230/460	3	57
2 $\frac{1}{2}$	CT25	CT25B	2"	1 $\frac{1}{2}$ "	115/230	1	62
	CT253	CT25B3	2"	1 $\frac{1}{2}$ "	208/230/460	3	62

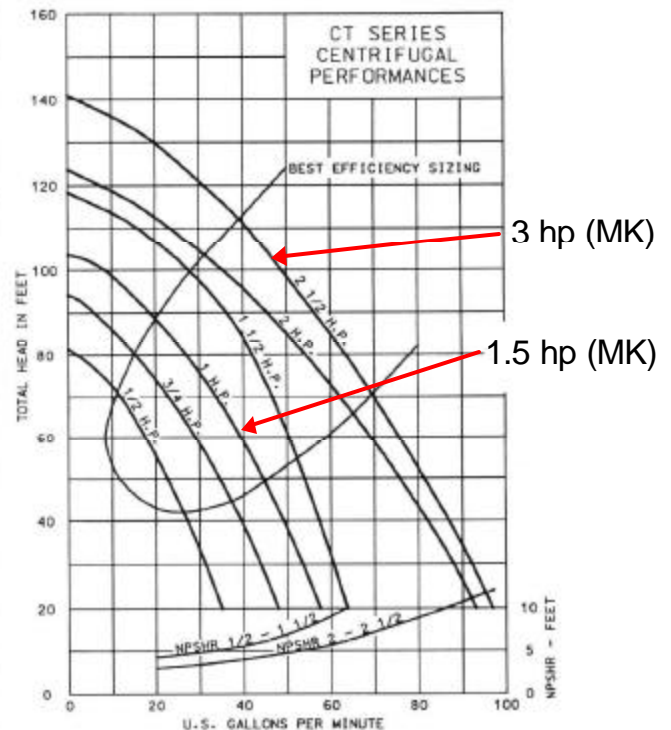
ADVANTAGES BY DESIGN

- Heavy duty cast iron construction.
- Back pull-out design.
- Dependable double ball bearing motor
- Continuous duty rating motor.
- Choice of brass or composite impeller.
- Brass impeller pumps rated 212° F.
- Composite impeller pumps rated 140° F.
- Maximum working pressure of 125 psi.
- CSA listed.

Applications

- Booster service
 - Irrigation
 - Circulating
 - Cooling towers
 - Air conditioning
 - Liquid transfer
 - Sprinkling systems
 - General industrial service
- Note: MK Environmental uses oversized pump motors. See below

PUMP PERFORMANCE



WHERE INNOVATION MEETS TRADITION

Myers

ISO 9001 Certified Company

CT Series

High Pressure Centrifugal Pumps

1/2 - 2 1/2 HP

Heads to 140 Feet

Capacities to 95 GPM

1. MOTOR MK standard is TEFC construction

- NEMA standard
- Double ball bearing
- Open drip proof
- 60 Hz, 3450 rpm
- Stainless steel shaft
- Single phase with built-in overload protection
- Three phase require overload protection in starter unit
- Non-overloading
- Continuous duty
- Strong capacitor start design

2. SEAL PLATE

- Heavy duty cast iron for dependable service and long life

3. IMPELLER

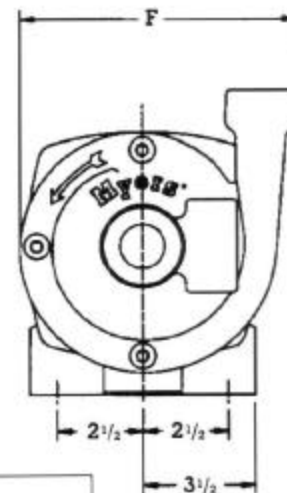
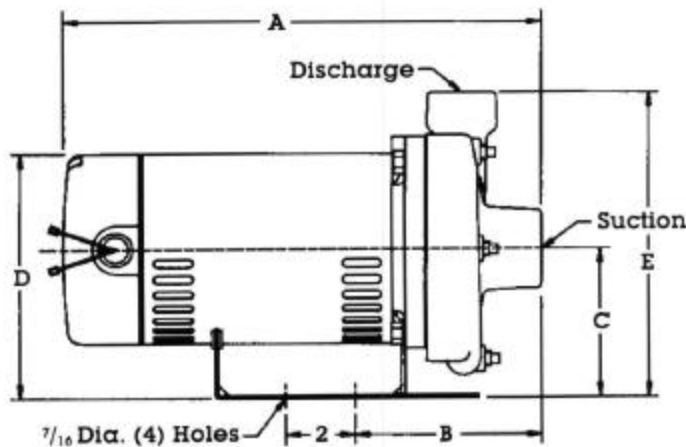
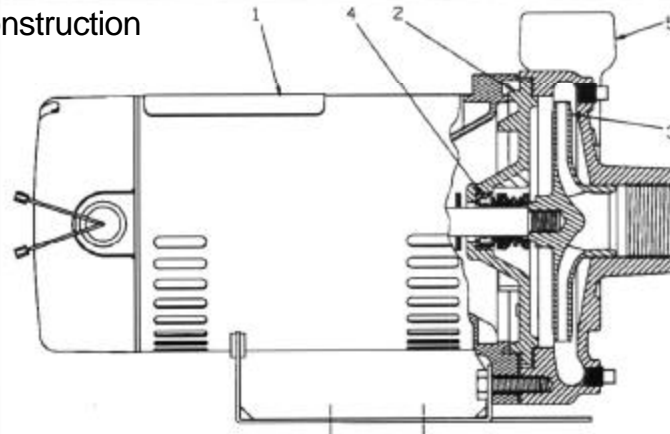
- Reinforced composite for applications to 140° F.
- Threaded SST insert on composite impellers
- Brass for applications to 212° F.
- Enclosed design for high efficiencies
- Balanced for smooth operation

4. MECHANICAL SEAL

- Standard carbon/ceramic faces, Buna elastomers, 300 series SST components (standard for pumps with composite impellers)
- High temperature carbon/ceramic faces, viton elastomers, 300 series SST components (standard for pumps with brass impellers)

5. CASING

- Heavy duty cast iron construction
- Back pull-out design
- Discharge can be rotated in four positions
- Tapped openings for priming, venting and draining.
- Vertical discharge standard



HP	Dimensions, inches							
	A	B	C	D	E	F	Suct.	Disch.
1/2	13 7/8	5 1/2	4 3/8	7 1/4	9	8	1 1/4	1
3/4	14 3/8	5 1/2	4 3/8	7 1/4	9	8	1 1/4	1
1	15 1/8	5 1/2	4 3/8	7 1/4	9	8	1 1/4	1
1 1/2	15 1/8	5 1/2	4 3/8	7 1/4	9	8	1 1/4	1
2	16 1/2	6 1/4	4 1/2	7 1/2	9 1/2	8 7/8	1 1/2	1 1/4
2 1/2	16 1/2	6 1/4	4 1/2	7 1/2	9 1/2	8 7/8	2	1 1/2



FZ300

Cellular Monitoring System

Overview:

The FZ300 is a compact cellular transceiver for monitoring industrial equipment that sends live data to the monitoring web site, providing real-time status and alarms. It features 14 digital inputs, 4 digital outputs and 2 analog inputs. In addition to alarming on status changes, the system keeps track of on-time and cycles for the digital inputs; useful for monitoring pump, fan, or compressor run times and duty cycles. Analog inputs can alarm on high or low conditions and are useful for monitoring temperatures, pressures, tank levels or flow rates. The unit monitors input power voltage and provides an optional battery backup which enables the system to alarm on main power voltage level or failure and continue operating without main power.

The easy to use web site updates continuously, displaying location and operating status for all of your monitored equipment. Alarms are immediately displayed on the web site and trigger messages sent to interested personnel in your organization via SMS text messages and emails. Every event is permanently logged in the web site allowing powerful historical analysis using the built in reporting features to give equipment owners detailed insight into the operation and readiness of their equipment fleets.

Proactive service reminders are automatically generated and sent as equipment reaches service intervals based on run-time. Service logs and manuals available over the secure web site reduce paperwork and automate record keeping while providing up to the minute service records for all of your monitored equipment.

Technical Specifications:

Size	4.0" x 4.3" x 2.3" in.	Power	9 - 32 Volts DC
Radio	Quad Band GPRS GSM	Battery Backup	Internal
Transmit Power		Current Consumption	
850 / 900 MHz	Class 4, 2 Watts	Idle	65 mA
1800 / 1900 MHz	Class 2, 1 Watt	Transmit, Average	250 mA
Digital Inputs	14	Peak	2.1 A
Digital Outputs	4	Temperature	
Analog Inputs	2, 0-5 Volt or 0 to 20 mA	Operating	-30°C to +70°C
Connectors	5mm Terminal Blocks	Storage	-40°C to +85°C
GSM Connector	SMA	Max. Humidity	95% Non-Condensing

Features:

Easy to install cellular monitoring system. A variety of optional enclosures and mounting options provide for a clean and professional installation. Unit includes a quad magnet bracket for quick mounting and templates for mounting with included standoffs.

Advanced power management employing low power idle modes enable the unit to operate in solar powered applications with minimal power draw.

No software to buy, install or maintain; all mapping and data features are accessible over the secure web site from any computer with Internet access.

Radio Agency Approvals:

FCC	Part 15 Part 22 Part 24
GCF	Version 3.21.1
PTCRB	Version 3.7.1
Industry Canada	Yes
CE Mark	Yes
RoHS Compliant	Yes
Emark	Yes

Each Complete Monitoring System Includes:



Digital Cellular Monitoring Unit:

- 14 Digital Inputs
- 4 Digital Outputs
- 2 Analog Inputs
- Connected 24x7x365



Low Profile or High Gain Cellular Antenna:

- 4" (Low Profile)
- 12.4" (High Gain)
- 12' Cable Length
- Magnet Mount



Mapping & Reporting:

- Web Accessible
- Graphical Map Overview
- Simple User Interface
- Run Service Reports
- Monitor Equipment Use



Alarming & Notifications:

- Equipment Status Change
- Equipment Service Needed
- SMS Text Message
- BlackBerry, PDA Message
- Email

Flameless Electric Catalytic Oxidizer Model 300E

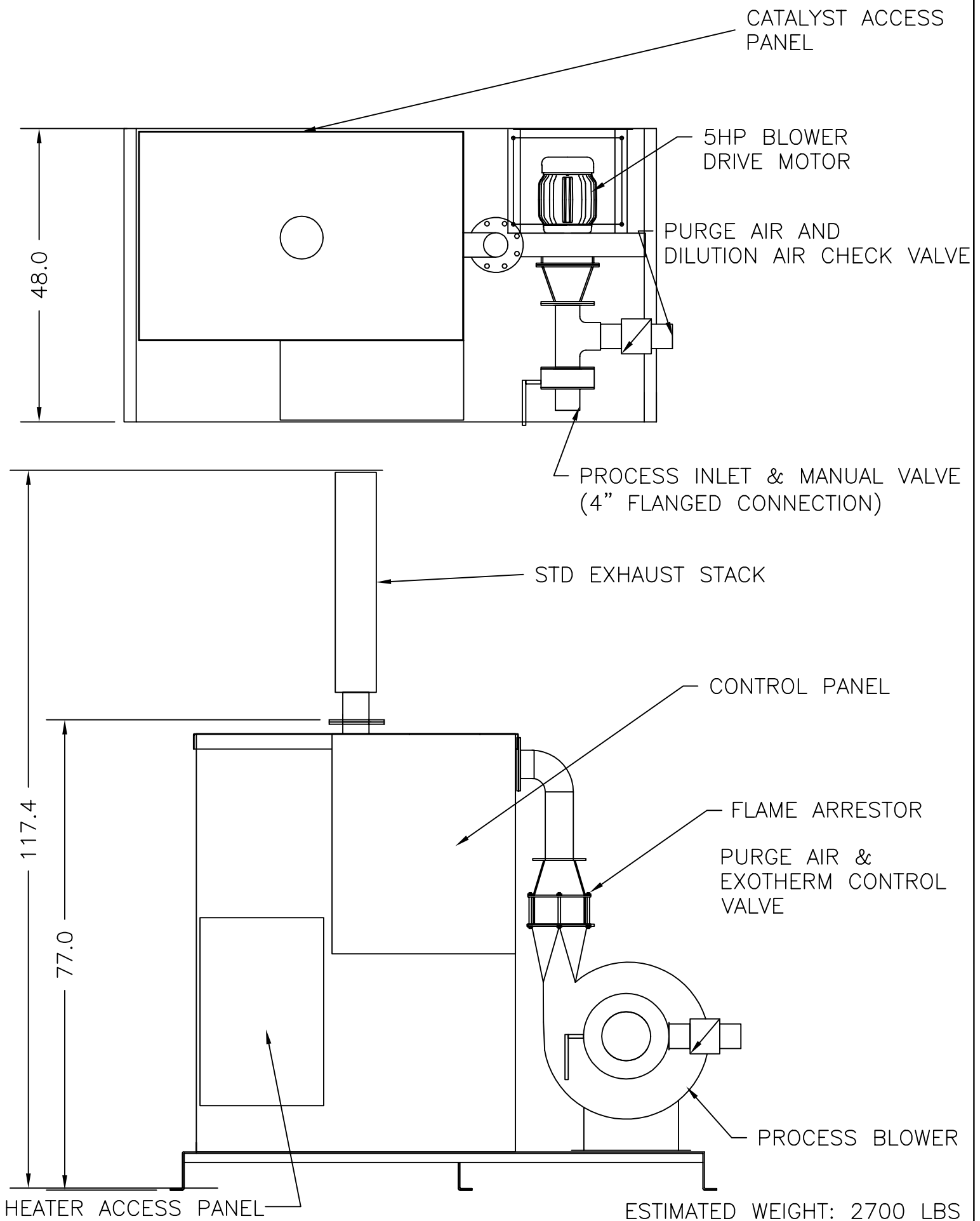
The model 300E is an electrically pre-heated catalytic oxidizer designed to treat hydrocarbon contaminated air streams from 100-300 SCFM for either SVE systems or Groundwater air strippers or both. The Cat-ox is designed to operate completely independent of the process and typically requires an enable/disable signal interface with the supply system control panel. **It should not be used for chlorinated hydrocarbons.**

Base System Components

Oxidizer Reactor, 304 stainless steel	Automatic Dilution Control
50-60% Tube & Shell Heat Exchanger	UL Rated Control Panel
Oxidizer Process Blower	Thermocouple Temperature Control
Inlet Flame Arrestor	Hour Meter
Air Flow Sensor and Gauge	Stainless Steel Exhaust Stack
Nema 4 Control Panel, PLC Based	First Out Fault Finder

Specifications

Maximum Air Flow Capacity:	300 SCFM
Minimum Air Flow:	50 SCFM
Maximum Inlet Temperature from Source:	180 degree F.
Electric Pre-Heater:	0-25 KW
Inlet Connection:	4" Flexible
Stack Height:	120" Above Ground
Stack Diameter:	6"
Heat Exchanger Efficiency:	Nominal 50-60%
Catalyst Type:	Precious Metal Monolith
Minimum Catalyst Inlet Temperature:	600 degree F.
Catalyst Operating Temperature:	650 degree F.
Maximum Catalyst Operating Temperature:	1200 degree F.
Catalyst Gas Hourly Space Velocity:	39,000 GHSV ¹
Catalyst Destruction Efficiency:	>99% GRO
Catalyst Volume:	.458 ft ³
Maximum Hydrocarbon Throughput:	20% LEL
Oxidizer Process Blower:	3hp
Time To Reach Operating Temperature:	30-40 Minutes from cold
Noise level:	<80 dBA at a distance of 10'
Power Requirements: (based upon available voltage)	460VAC 3 Phase (60 Amp) 230VAC 3 Phase (80 Amp)
(Factory Pre-wired)	
System Size:	L=90", W=48", H=77"
System Weight:	2,500 lbs





Engineering. Environmental. Answers.

Permit Applications

NOTICE OF INTENT – GENERAL PERMIT NUMBER ALG340000

(ADEM Form 394 _____)

DISCHARGES ASSOCIATED WITH PETROLEUM PRODUCTS CONSISTING OF STORM WATER, HYDROSTATIC TEST WATER, AND GROUNDWATER RESULTING FROM THE STORAGE, HANDLING, TRANSPORTATION, INVESTIGATION OF POTENTIAL CONTAMINATION, OR OTHER OPERATIONS INVOLVING PETROLEUM AND TREATED VEHICLE WASHWATER ASSOCIATED WITH PETROLEUM AND ITS DERIVATIVES

Mail to: Alabama Department of Environmental Management
Industrial General Permit Section
Industrial/Municipal Branch
Water Division
Post Office Box 301463
Montgomery, Alabama 36130-1463

FOR OFFICE USE ONLY	
NPDES PERMIT NUMBER	_____
FACILITY NUMBER	_____

ANSWER ALL QUESTIONS IN APPLICABLE SECTIONS. PLEASE MARK THE “**NOT APPLICABLE**” BOX IF A SECTION IS NOT APPLICABLE. INCOMPLETE OR WRONG ANSWERS COULD RESULT IN MORE STRINGENT PERMIT REQUIREMENTS. IF SPACE IS INSUFFICIENT TO ADDRESS ANY ITEM BELOW PLEASE CONTINUE ANSWER ON AN ATTACHED SHEET OF PAPER.

FACILITY IDENTIFICATION INFORMATION

- A. Name of Facility to be shown on Permit: Capitol Heights Mini Mart
Name of permittee if different from above: Krish-R, Inc.
- B. Mailing Address of Facility: – PO Box or Street Route 1336 Hallwood Lane
City, State and Zip Code Montgomery, AL 36117
- C. Location (STREET ADDRESS) of Facility: 1705 Upper Wetumpka Road
City, County: Montgomery, AL 36107 Montgomery
- D. Provide the latitudinal and longitudinal coordinates of the facility location. (Front Gate):
Latitude 32.385194 N Longitude -86.284944 W
- E. Facility Contact Person and Title: Rajesh Patel, Owner
Telephone Number: 334-281-1928
- F. Standard Industrial Code (SIC) (Names and Codes): 4959 - Sanitary Services
- G. Description of industrial activity and land use at the facility:
Active Gas Station/Groundwater Remediation
- H. Check the type of discharge at your facility and complete the applicable sections associated with the type checked:
- Groundwater and/or storm water incidental to groundwater cleanup operations which has been contaminated with automotive gasoline, aviation fuel, jet fuel, or diesel fuel
 - Storm water from petroleum storage and fueling areas
 - Exterior vehicle and equipment wash water
 - Hydrostatic test water generated on site.
- I. Please indicate which, if any, of the discharges in H. are combined.

- J. Has the facility ever been issued an NPDES Permit? Yes [] No [x]
Please provide the permit number and facility name at time of permitting.
Permit Number: _____
Facility Name: _____
- K. Has the facility been issued an NPDES **INDIVIDUAL** wastewater permit?
Yes [] No [x] NPDES Permit No. AL00 _____
Do you intend to replace your individual permit with this General Permit? Yes [] No []
- L. Has the facility been issued a State Indirect Discharge (SID) Permit?
Yes [] No [x] SID Permit No. IU _____
- M. Is this Notice of Intent for (check one):
x First time issuance of a **GENERAL** Permit
Renewal of **GENERAL** Permit No. ALG _____
Modification of **GENERAL** Permit No. ALG _____
- N. Are any of the discharges that you intend to be covered by this permit going to municipal storm sewer?
Yes [x] No []
- O. Name of surface water to which the municipal storm sewer discharges: _____
- P. Have you notified the municipality by letter as required by 40 CFR 122.26(a)(4)? Yes [x] No []
- Q. Date facility started or will start operations: 08/01/2019
- R. What is the size of the site in acres? 0.5
- S. Do you discharge to any waters of the State that are impaired (303(d) or TMDL)? Yes [] No [x]
(A list of the impaired waters can be found at <http://adem.alabama.gov/programs/water/303d.cnt>
for 303(d)listed waters and <http://adem.alabama.gov/programs/water/wquality/2011ApprovedTMDLs.zip> for waters
subject to a TMDL.)
If yes, do your discharges contain pollutants of concern listed for the impaired water(s)? Yes [] No []
If yes, then enhanced BMPs are required. Also, an Individual NPDES Permit may be required, so please contact the
Industrial/Municipal Branch of ADEM before proceeding.

DSN001-DISCHARGES ASSOCIATED WITH GROUNDWATER REMEDIATION ACTION

NOT APPLICABLE []

A. List latitude and longitude (to seconds) of the point where each discharge exits your property and name of receiving stream:

0011	Latitude	<u>32.385167</u>	N	Longitude	<u>-86.284639</u>	W
	Receiving Stream	<u>UT to Alabama River</u>				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				
	Latitude	_____	N	Longitude	_____	W
	Receiving Stream	_____				

- B. Has groundwater runoff from the facility been analyzed for presence of any known pollutants? Yes [] No [x] If yes, attach the most recent copy of the analysis.
- C. Groundwater discharges to:
 x Surface water
 Seeps into the ground
 Municipal storm sewer
- D. Does the facility discharge to a public water supply stream segment as defined by ADEM Administrative Code R. 335-6-11-.02? Yes [] No [x]
- E. This permit requires the development and implementation of a Best Management Practice (BMP) Plan. Does the facility have a BMP Plan? Yes [x] No []
- F. Does the facility have any of the following other control measures to prevent pollution?
- | | |
|---|----------------|
| 1. Structural control measures (basins, etc.) | Yes [] No [x] |
| 2. Treatment of groundwater (retention, aeration) | Yes [x] No [] |
| 3. Other. If so, please describe. _____ | |
-
- G. List outfall(s) in A. of this section that are treated for groundwater
 DSN001-1
-
- H. Will there be any discharge of groundwater as a result of aquifer testing? Yes [] No [x] If yes, this discharge must meet the requirements of this general permit.
- I. Does the facility plan to discharge well purge waters? Yes [x] No [] If yes, this discharge must meet the requirements of this general permit.
- J. Does the facility plan to discharge storm water accumulated in UST tank pits during closure? Yes [] No [x] If yes, this discharge must meet the requirements of this general permit.
- K. Were there any past industrial activities on the site that would contribute to storm water pollution? Yes [] No [x] If yes, please explain.
- L. Did the facility handle leaded fuels? Yes [] No [x] If yes, did the contamination result from the handling of leaded fuel? Yes [] No []
- M. Has the facility ever handled aviation fuel, jet fuel, or diesel fuel? Yes [x] No [] If yes, did the contamination result from the handling of aviation fuel, jet fuel, or diesel fuel? Yes [] No [x]
- N. Will you stockpile contaminated material on site? Yes [] No [x] If yes, which outfall(s) in A. of this section are for storm water runoff from these stockpiles?

DSN002 AND DSN004 – STORM WATER FROM PETROLEUM BULK STORAGE AND FUELING AREAS

NOT APPLICABLE [X]

A. List latitude and longitude (to seconds) of the point where each discharge exits your property and name of receiving stream:

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Number

Size

B. List number and size of above ground storage tanks.

List number and size of underground storage tanks.

- C. Has storm water runoff from the facility been analyzed for presence of any known pollutants? Yes [] No []
If yes, attach the most recent copy of analysis.
- D. Storm water runoff discharges to:
Surface water
Seeps into ground
Municipal storm sewer
- E. This permit requires the development and implementation of a Best Management Practices (BMP) plan. Does the facility have a BMP Plan? Yes [] No []
- F. Does the facility have any of the following other control measures to prevent pollution?
1. Structural control measures (basins, etc.) Yes [] No []
2. Treatment of groundwater (retention, aeration) Yes [] No []
3. Other. If so, please describe. _____
- G. Known impact on receiving water? Yes [] No [] If yes, to what extent?

- H. Have any leaks, spills or other instances of storm water contamination occurred within the last 3 years?
Yes [] No [] If yes, what occurred and how did it happen?
- I. Are any above ground tanks that contain a possible pollutant double-walled? Yes [] No []
- J. Are all above ground tanks that contain a possible pollutant double-walled? Yes [] No []
- K. Are any above ground tanks that contain a possible pollutant diked? Yes [] No []
- L. Are all above ground tanks that contain a possible pollutant diked? Yes [] No []
- M. Can dikes contain 110% of the contents of the largest tank in the dike? Yes [] No []
- N. Are the walls and floors of the dikes relatively impermeable to the stored substance? Yes [] No []
- O. From which outfalls in A (this section) is uncontaminated storm water from secondary containment (for above ground storage tanks only) areas discharged? _____
- P. Is treated or untreated water from tank bottoms or water draws discharged on site? Yes [] No []
If yes, this particular discharge cannot be covered under this permit. Please contact the Industrial Branch of ADEM before proceeding.
- Q. Were there any past industrial activities on the site that would contribute to storm water contamination?
Yes [] No []. If yes, explain. _____
- R. Does the facility handle leaded fuels? Yes [] No []
- S. Does the facility handle aviation fuel, jet fuel, or diesel fuel? Yes [] No []
- T. Is hydrostatic testing of petroleum handling equipment done on site? Yes [] No [] If yes, this particular discharge cannot be covered under this permit. Please contact the Industrial Section of ADEM before proceeding.
- U. Are any trucks or equipment fueled at this facility? Yes [] No [] Is your fueling area protected from storm water including flowing water? Yes [] No [] If yes, please explain:

- V. Is storm water/wash down water from the fueling/loading area treated (oil/water separator, etc.) prior to discharge? Yes [] No []
- W. Does the facility comply with 40 CFR Part 112? Yes [] No []
Last update of SPCC Plan, if applicable

In accordance with 40 CFR Section 112.5 (b), applicable facilities must complete a review and evaluation of the SPCC Plan at least once every five years. If the provided date indicates the SPCC Plan is not valid, is the SPCC Plan currently being reviewed by a Professional Registered Engineer? Yes [] No []

If an SPCC Plan date was not entered, is it because the facility's petroleum storage capacity is below the volume that would require an SPCC Plan? Yes [] No []

X. Is storm water from fueling areas allowed to mix with storm water from other industrial activities? Yes [] No []

Y. Does any discharge or runoff from the facility reach a public water supply stream segment as defined by ADEM Administrative Code R. 335-6-11-.02? [] Yes [] No

DSN005 – DISCHARGES ASSOCIATED WITH VEHICLE AND EQUIPMENT EXTERIOR WASHING OPERATIONS

NOT APPLICABLE [X]

A. List latitude and longitude (to seconds) of the point where each discharge exits your property and name of receiving stream:

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

- B. Is this process water commingled with storm water prior to discharge? Yes [] No []
- C. Has the process water been analyzed for presence of any known pollutants? Yes [] No []
Attach the most recent copy of analysis.
- D. Give detailed description of wash water use, additives, location, ultimate disposal, etc.

E. Do you wash interior of tank rail cars or tank trailers? Yes [] No []
If yes, the facility cannot be covered under this General Permit. Please contact the Industrial Section of ADEM before proceeding.

F. How do you dispose of spent oil, hydraulic fluids and any other potential pollutants that you handle?

G. Does your facility use organic or petroleum based solvents in its washing operations? Yes [] No []
If yes, the facility cannot be covered under this general permit. Please contact the Industrial Section of ADEM before proceeding.

DSN007 – DISCHARGES ASSOCIATED WITH HYDROSTATIC TEST WATER

NOT APPLICABLE [X]

A. List latitude and longitude (to seconds) of the point where each discharge exits your property and name of receiving stream:

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Latitude _____ N Longitude _____ W

Receiving Stream _____

Number

Size

B. List number and size of above ground storage tanks.

List number and size of underground storage tanks.

C. Has storm water runoff from the facility been analyzed for presence of any known pollutants? Yes [] No []
If yes, attach the most recent copy of analysis.

D. Storm water runoff discharges to (circle one):

Surface water

Seeps into ground

Municipal storm sewer

E. This permit requires the development and implementation of a Best Management Practices (BMP) Plan. Does the facility have a BMP Plan? Yes [] No []

F. Does the facility have any of the following other control measures to prevent pollution?

1. Structural control measures (basins, etc.) Yes [] No []

2. Treatment of groundwater (retention, aeration) Yes [] No []

3. Other. If so, please describe. _____

G. Known impact on receiving water? Yes [] No [] If yes, to what extent?

H. Is treated or untreated water from tank bottoms or water draws discharged on site? Yes [] No [] If yes, the facility will need to contact the Industrial Section of ADEM regarding an Individual Permit.

I. Is hydrostatic testing of petroleum handling equipment done on site? Yes [] No []
Please be aware the DSN007 outfall only covers hydrostatic test water generated on site.

J. Is chlorine present in any source water (i.e., city or well water) used for hydrostatic testing? Yes [] No []

K. Does the facility discharge to a public water supply stream segment as defined by ADEM Administrative Code R. 335-6-11-.02? Yes [] No []

GENERAL INFORMATION

Have you included a check for the application fee? Yes [X] No []

DO NOT SUBMIT APPLICATION AND PERMIT FEE SEPARATELY

CERTIFICATION: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment for knowing violations.

SIGNATURES

Signature: _____ Date Signed: _____

Name and Official title (type or print): _____

NOTE: This Notice of Intent must be signed by the official representative of the facility who is: the owner, the sole proprietor of a sole proprietorship, a general partner for a partnership, or by a ranking elected official or other duly authorized representative for a unit of government or an executive officer of **at least the level of vice president** for a corporation, having overall responsibility for the operation of the facility. If the Notice of Intent is not signed, or is found to be incomplete, it will be returned.

Address: _____

Phone Number: _____

DISCHARGE MONITORING REPORTS (DMR) CONTACT – PLEASE COMPLETE

DMR Contact Name and Official title (type or print): Trent Carnley, Project Manager

DMR Contact Address: P.O. Box 278, Andalusia, AL 36420

DMR Contact Phone Number: 334-222-9431

**PLEASE COMPLETE IF NOI IS PREPARED BY A CONSULTANT OR SOMEONE
OTHER THAN AN EMPLOYEE OF THE FACILITY**

Name of Individual (type or print): David Dailey, Project Engineer

Name of Firm: CDG Engineers & Associates, Inc.

Address: 3 Riverchase Ridge, Birmingham, AL 35244

Phone Number: 205-403-2600

Please attach or in the space below draw a map showing the location of the facility including major highways and/or landmarks.

Alabama Department of Environmental Management

Permittee Registration Form for e-DMR/e-SSO

This form should be used to register a Permittee for ADEM's E2 Reporting System and authorize any changes to permit requirements that may be necessary to allow the identified Permittee to submit Discharge Monitoring Reports and Sanitary Sewer Overflow Reports electronically. This form should also be used by the Permittee to add, change, or delete E2 Reporting System accounts for individuals that the Permittee authorizes (or no longer authorizes) to view/prepare or certify e-DMR or e-SSO submissions. **Note:** Any individual for which a Certifier account is requested must also sign and submit an Electronic Signature Agreement (ESA) for e-DMR/e-SSO (ADEM Form 512). A Certifier account cannot be created without a properly completed and signed ESA. Please review ADEM's E2 Reporting System Permittee Participation Package should you have any questions about completing this form. It is available on ADEM's website at <https://e2.adem.alabama.gov/NPDES>. Please send a hard copy of completed form(s) with original wet-ink signature(s) to:

ADEM
Attn: E2 Coordinator
P O Box 301463
Montgomery, AL 36130-1463

Part A. Permittee Information

1. Permit Number(s): 32713

Note: A Permittee may enroll in the E2 Reporting System for more than one permit on this form; however, please be aware that the User(s) listed in Part B below will have the authorities requested for each permit number listed above. If that is not your intention, only list the permit(s) for which you are requesting authorization for the User(s) listed in Part B below.

2. Permittee Name: Krish-R, Inc.

3. Mailing Address (Line 1): 1336 Hallwood Lane

4. Mailing Address (Line 2): _____

5. Mailing Address (City, State, Zip): Montgomery, AL 36117

6. Application Purpose: New Application Revised Permittee or Application Information Request for Reactivation

Part B. User Account Information (* indicates required information)

User Account Designation(s) (Both an Account Action and Account Type must be indicated for an e-DMR or e-SSO account.)

1.a. e-DMR Account Action: Add Update Delete N/A 1.b. Account Type: Viewer/Preparer Certifier
 2.a. e-SSO Account Action: Add Update Delete N/A 2.b. Account Type: Viewer/Preparer Certifier

Comment: _____

User General Information and Contact Information

David Dailey
 Mr. Ms. Dr. 3.a. First Name* 3.b. Middle Name/Initial 3.c. Last Name* 3.d. Suffix
 4. Job Title: Project Engineer 5. Employer's Name: CDG Engineers & Associates, Inc.
 6. e-mail*: david.dailey@cdge.com
 7.a. Office Phone No.*: 2054032600 7.b. Cell Phone No.: 2059945187
 8. Mailing Address (Line 1)*: _____ 3 Riverchase Ridge
 9. Mailing Address (Line 2): _____
 10. Mailing Address (City, State, Zip)*: Hoover, AL 35244

User Account Designation(s) (Both an Account Action and Account Type must be indicated for an e-DMR or e-SSO account.)

1.a. e-DMR Account Action: Add Update Delete N/A 1.b. Account Type: Viewer/Preparer Certifier
 2.a. e-SSO Account Action: Add Update Delete N/A 2.b. Account Type: Viewer/Preparer Certifier

Comment: _____

User General Information and Contact Information

 Mr. Ms. Dr. 3.a. First Name* 3.b. Middle Name/Initial 3.c. Last Name* 3.d. Suffix
 4. Job Title: _____ 5. Employer's Name: _____
 6. e-mail*: _____
 7.a. Office Phone No.*: _____ 7.b. Cell Phone No.: _____
 8. Mailing Address (Line 1)*: _____
 9. Mailing Address (Line 2): _____
 10. Mailing Address (City, State, Zip)*: _____

3 R D U S E R A C C O U N T

User Account Designation(s) (Both an Account Action and Account Type must be indicated for an e-DMR or e-SSO account.)

1.a. e-DMR Account Action: Add Update Delete N/A 1.b. Account Type: Viewer/Preparer Certifier

2.a. e-SSO Account Action: Add Update Delete N/A 2.b. Account Type: Viewer/Preparer Certifier

Comment: _____

User General Information and Contact Information

Mr. Ms. Dr. _____

3.a. First Name* _____ 3.b. Middle Name/Initial _____ 3.c. Last Name* _____ 3.d. Suffix _____

4. Job Title: _____ 5. Employer's Name: _____

6. e-mail*: _____

7.a. Office Phone No.*: _____ 7.b. Cell Phone No.: _____

8. Mailing Address (Line 1)*: _____

9. Mailing Address (Line 2): _____

10. Mailing Address (City, State, Zip)*: _____

Part C. Permittee Registration

I request that the above identified Permittee be registered for electronic reporting and request any Department initiated minor permit revisions (where no fee is required) that may be necessary to allow use of the ADEM E2 Reporting System. As a Responsible Official or a Duly Authorized Representative, I agree that representatives for this facility will follow permit requirements and the procedures for the electronic submission of DMR and SSO report forms, as described in the Permittee Participation Package.

Please establish or revise the above user accounts in accordance with the information provided for each identified User Account. I understand that if a Certifier account is requested for an individual above, an Electronic Signature Agreement (ESA) for e-DMR/e-SSO (ADEM Form 512) must be properly completed and signed. A Certifier account will not be created without a properly completed and signed ESA.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name of Responsible Official or Duly Authorized Representative <i>(Type or print legibly)</i>	Signature	Date Signed

Official Title <i>(Type or print legibly)</i>		
<p>Note: This form may only be signed by a Responsible Official (RO) or Duly Authorized Representative (DAR), as specified in the ADEM Admin. Code. An RO may sign this form to appoint any individual as a Viewer/Preparer or Certifier. A DAR may sign this form to appoint himself/herself as a Viewer/Preparer or a Certifier, but may only sign this form for another individual to appoint them as a Viewer/Preparer. The ADEM Admin. Code does not allow a DAR to delegate signatory authority to another individual.</p> <p>If a DAR signing this form has been granted signatory authority by a document other than an accompanying ADEM Form 512 (ESA), please provide a copy with this application to expedite the processing.</p>		

For ADEM Use Only

Name	Date	Date
Received By:	<input style="width: 100%;" type="text"/>	Trial Start: <input style="width: 100%;" type="text"/>
Approved By:	<input style="width: 100%;" type="text"/>	Full E2: <input style="width: 100%;" type="text"/>
E2 Updated:	<input style="width: 100%;" type="text"/>	
Notes: _____		

Alabama Department of Environmental Management
Electronic Signature Agreement (ESA) for e-DMR/e-SSO

AGREEMENT FOR SUBMITTING ELECTRONIC DOCUMENTS TO THE ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (ADEM) USING THE ALABAMA ELECTRONIC ENVIRONMENTAL (E2) REPORTING SYSTEM (the "Agreement"), by and between the ADEM, Montgomery, Alabama, a state governmental agency, and reporting party ("Certifier") who has signed and returned this Electronic Signature Agreement (ESA), is effective on the date on which ADEM issues the initial PERSONAL IDENTIFICATION NUMBER (PIN), in acceptance of Certifier's signed ESA.

1. **RECITALS.** The intent of this agreement is to create legally binding obligations upon the parties using the specified data transmission protocols and the E2 Reporting System, to ensure that the Certifier agrees to: (i) maintain the confidentiality and protect the electronic signature from unauthorized use or compromise, and follow any procedures specified by the ADEM for this purpose; (ii) be held as legally bound, obligated, or responsible by use of the assigned electronic signature as by hand-written signature.
2. **VALIDITY AND ENFORCEABILITY.** This Agreement has been executed by the parties to evidence their mutual intent to follow Department procedures to create binding regulatory reporting documents using electronic transmission and receipt of such records consistent with the provisions of Chapter 6 of the ADEM Administrative Code. Acceptance and execution of this agreement by the ADEM shall be evidenced by the issuance of a PIN to the Certifier. Consistent with ADEM Administrative Code electronic signatures under this agreement shall have the same force and effect as a written signature.
3. **RECEIPT.** Once submitted by a Certifier, a document shall be deemed received by ADEM when the submission ID is generated and the file processed by the E2 System Server. No Document shall satisfy any reporting requirement or be of any legal effect until the auto generated submission ID is provided. The Certifier is responsible for the content of each transmission, in accordance with the associated certification statement, and for reviewing the accuracy of the processed document information and as made available by the ADEM E2 Reporting System.
4. **SIGNATURE.** The Certifier shall adopt as its electronic signature any Personal Identification Number (PIN) assigned by ADEM following acceptance of this ESA. The Certifier agrees that any such Signature affixed to or associated with any transmitted Document shall be sufficient to verify such party originated and possessed the requisite authority both to originate the transaction and to verify the accuracy of the content, in the format of the specified E2 Reporting System transmission protocol or otherwise, at the time of transmittal. The Certifier also expressly agrees that each report it submits by using its PIN constitutes their agreement with the associated certification statement.
5. **DEFINITIONS.** Whenever used in this Agreement or any documents incorporated into this Agreement by reference, the following terms shall be defined as follows:
 - (a). *Personal Identification Number (PIN).* Assigned by ADEM following acceptance of this ESA, each PIN will consist of a unique sequence of alpha-numeric characters and when combined with the knowledge based security question answer shall constitute the electronic signature.
 - (b). *Compromise.* When the PIN is intentionally or unintentionally given, disclosed, delegated, or otherwise made available, including any theft or loss, to any other person or organization.
 - (c). *Writing.* Any document properly transmitted pursuant to this Agreement shall be considered to be a "writing" or "in writing".
6. **TRANSMISSION PROTOCOLS.** All Reports transmitted between the parties shall adhere to the Protocol(s) established by the ADEM for files to be received by the ADEM E2 Reporting System and in affect at the time of a transaction. The Department may modify such Protocol(s), as may be necessary, to promote or continue usability of the E2 Reporting System. The Department shall make available any such Protocol(s), changes to Protocols, or related implementation guidelines for reporting using the ADEM E2 Reporting System.
7. **SECURITY.** The parties shall take reasonable actions to implement and maintain security procedures necessary to ensure the protection of transmissions against the risk of unauthorized access, alteration, loss or destruction including, but not limited to: protecting the secrecy of passwords and electronic signatures and transmitting only files in an acceptable protocol.
 - (a). *Use of PIN.* Each Certifier shall be either the Responsible Official or a person identified as an authorized representative for signatory purposes by the Responsible Official for each facility, person, or other entity for which information is being reported. If a PIN has been compromised or where there is evidence of potential compromise, it will be automatically or manually suspended. In addition, ADEM will inactivate or revoke a PIN where the Certifier is no longer an authorized representative. Each Certifier expressly agrees that the Department may act immediately and unilaterally in any decision to suspend, inactivate, revoke, or otherwise disallow use of a PIN by any Certifier, where the Department believes that such action is necessary to ensure the authenticity, integrity, or general security of transmissions or records, or where there are any actual or apparent violations of this ESA.

- (b). *Protection of PIN.* Each party must protect the security and confidentiality of any PIN from compromise and shall take all necessary steps to prevent its loss, disclosure, modification, or unauthorized use. The Certifier shall notify ADEM immediately, but, not later than one business day, if it has reason to believe the security of any PIN has been compromised and must request a change. If ADEM has reason to believe that PIN security has been compromised, the ADEM will consult with the Certifier, when practical, and initiate PIN changes where necessary. The Certifier is responsible for immediately notifying ADEM (in writing) of termination of employment, reassignment, or any other change or cessation of status as an authorized representative.
- 8. SEVERABILITY.** Any provision of this Agreement which is determined to be invalid or unenforceable will be ineffective to the extent of such determination without invalidating the remaining provisions of this Agreement or affecting the validity or enforceability of such remaining provisions.
- 9. INABILITY TO TRANSMIT OR FILE REPORTS ELECTRONICALLY.** No party shall be liable for any failure to perform its obligations in connection with any Electronic Transaction or any Electronic Document, where such failure results from any act or cause beyond such party's control which prevents such party from electronically transmitting or receiving any Documents, except that the Certifier is nonetheless required to submit records or information required by law via other means, as provided by applicable law and within the time period provided by such law.
- 10. GOVERNING LAW.** This Agreement shall be governed by and interpreted in accordance with Chapter 6, Alabama Statutes, other applicable provisions of Laws of Alabama, and the Federal laws of the United States.

The ADEM and the Certifier have caused this Agreement to be properly executed on their behalf, as of the date the Certifier is issued a PIN, in accordance with and following acceptance of this agreement by the ADEM.

Type or Print Legibly

Certifier:

I, the undersigned, have the authority to enter into this Agreement under the ADEM Admin. Code r. 335-6-5-.14 or 335-6-6-.09, as applicable, for (Permittee Name) _____ and for (Permit Number(s) _____.

Name of Certifier <i>(Type or print legibly)</i>	Certifier's Signature	Date Signed
Certifier's Official Title <i>(Type or print legibly)</i>	Certifier's Employer's Name <i>(Type or print legibly)</i>	

If the Certifier listed above does not meet the definition of Responsible Official as defined in the ADEM Admin. Code r. 335-6-5-.14(1) or 335-6-6-.09(1), as applicable, or has not been previously appointed as an Authorized Representative as provided in ADEM Admin. Code r. 335-6-5-.14(2) or 335-6-6-.09(2), as applicable, a Responsible Official (RO) must appoint the Certifier as an Authorized Representative below:

I, (RO Name) _____, authorize the individual named above to sign reports and other information *(excluding applications, reports, and other information specified in ADEM Admin. Code r. 335-6-5-.14(1) or 335-6-6-.09(1), as applicable, as requiring the signature of a Responsible Official)* on my behalf for (Permittee Name) _____ as an Authorized Representative and certify that the individual named above meets the criteria for an Authorized Representative as defined in ADEM Admin. Code r. 335-6-5-.14(2)(b) or 335-6-6-.09(2)(b), as applicable.

Responsible Official's Signature	Responsible Official's Title <i>(Type or print legibly)</i>	Date Signed
---	---	--------------------



Engineering. Environmental. Answers.

CDG Engineers & Associates, Inc.

3 Riverchase Ridge

Hoover, AL 35244

Tel (205) 403-2600

Fax (205) 403-2623

www.cdge.com

April 25, 2019

Ms. Katie Smith
Energy Branch
Air Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, Alabama 36130-1463

Re: Request for Approval of Air Emission Control

Capitol Heights Mini Mart
ADEM Facility I.D. No. **23245-101-006835**
UST Incident No. **UST17-06-04**
1705 Upper Wetumpka Road
Montgomery, Alabama (Montgomery County)

Dear Ms. Smith:

CDG Engineers & Associates, Inc. (CDG) has been requested by the Alabama Department of Environmental Management (ADEM) to perform corrective action activities for the Capitol Heights Mini Mart facility located in Montgomery, Alabama. Air emissions will be produced during the operation and maintenance of a proposed Dual-Phase Vapor Extraction (DPVE) system. Free product was detected in six monitoring wells at the site during the most recent groundwater sampling event (March 26, 2019). The site is eligible for Alabama Tank Trust Fund (ATTF) reimbursement.

The proposed air control device for the DPVE system will consist of a catalytic oxidizer rated for up to 300 ACFM. Groundwater will be recovered at an approximate rate of 3.0 gpm. Emissions from the air stripper will be treated using activated carbon.

Attached is the Remediation Approval Form. Based on CDG's remediation experience, the rate of off gas loading will decrease rapidly with time as concentrations decrease throughout the remediation process. Therefore, the amount of treatment will decrease with time. Once free product has been removed and the off gas loading concentrations decrease, the DPVE system's air emission control system may be discontinued.

The proposed system will use a total of nine (9) recovery wells. The most recent groundwater sampling event was conducted at the site on March 26, 2019. The analytical results are attached.

ALBERTVILLE

ANDALUSIA

AUBURN

DOTHAN

GADSDEN

HOOVER

HUNTSVILLE



Engineering. Environmental. Answers.

If you have any questions or need any additional information, please call me at 205-403-2600.

Sincerely,

A handwritten signature in blue ink, appearing to read "David Dailey". The signature is fluid and cursive, with a large initial "D" and a long, sweeping tail that extends to the right.

David Dailey, P.E.
CDG Engineers & Associates, Inc.

REMEDICATION APPROVAL

This form should be submitted to the Department to obtain Air Division approval prior to operating any type of remediation system. Depending on the type of remediation system being proposed, some of the following questions may not apply:

TYPE REMEDIATION SYSTEM: (Check One)

- Soil-Vapor Extraction (SVE) – soil remediation (Short Term Event)
- Groundwater Vapor Extraction (GVE) – groundwater remediation
- Dual-Phase Vapor Extraction (DPVE) – soil & groundwater remediation
- Mobile Enhanced Multi-Phase Extraction (MEME) – short term remediation of soils and/or groundwater.

Is Free Product Present? Yes No

Is This a Pilot Study? Yes No

OWNER: Name: Krish-R, Inc.

Phone No.: 334-281-1928

Mailing Address: 1336 Hallwood Lane

City: Montgomery State: Alabama Zip: 36117

SITE: Facility Name: Capitol Heights Mini Mart

Facility Address: 1705 Upper Wetumpka Road

Location: (City) Montgomery (County) Montgomery (State) Alabama

Facility ID No.: 23245-101-006835 UST Incident No.: UST17-06-04

CONTAMINANTS: On a separate page please list all contaminants along with the most recent sample data for each well. This data should include concentrations for each contaminant and each well along with the calculations for potential and actual emissions (lbs./hr.).

REMEDICATION SYSTEM: Please provide a brief description along with a diagram of the remediation system.

Description of remediation system:

A multi-phase extraction system with a 40 hp liquid ring blower capable of 490 ACFM at 20" hg, 200 gallon air water separator, water oil separator and air stripper treatment system. The system will be connected to a network of 9 recovery wells with an average combined groundwater flow of 3.0 gpm.

Proposed date of implementation: August 1, 2019

Anticipated length of event: 3 years

Groundwater recovery rate: 3.0 gpm

Soil Vapor extraction rate: 300 SCFM

Type & efficiency of proposed Air Control Device if system does not pass modeling:

Catalytic Oxidizer (>99% efficiency)

Please include the following information for all sites:

Distances from emission point to fence (ft): NA

Total potential hours of operation: Continuous

Liquid Ring Vacuum Pump

Stack 1:	Height above ground	<u>15 ft</u>	Inside diameter	<u>0.5ft</u>
<i>(include info for <u>all</u> emission points)</i>	Exit Velocity	<u>25.5 ft/s</u>	Exit Temperature	<u>90°F</u>
Stack 2:	Height above ground	15 ft	Inside diameter	0.5 ft
<i>(include info for <u>all</u> emission points)</i>	Exit Velocity	34.0 ft/s	Exit Temperature	90°F
Stack 3:	Height above ground	ft	Inside diameter	ft
<i>(include info for <u>all</u> emission points)</i>	Exit Velocity	ft/s	Exit Temperature	°F

MONITORING: Soil (mg/m³) and/or groundwater (mg/L) samples are required on a quarterly basis. The sample data should be included in the semi-annual report.

Project Manager: David Dailey Phone No.: 205-403-2600






Consulting Firm: CDG Engineers & Associates, Inc.

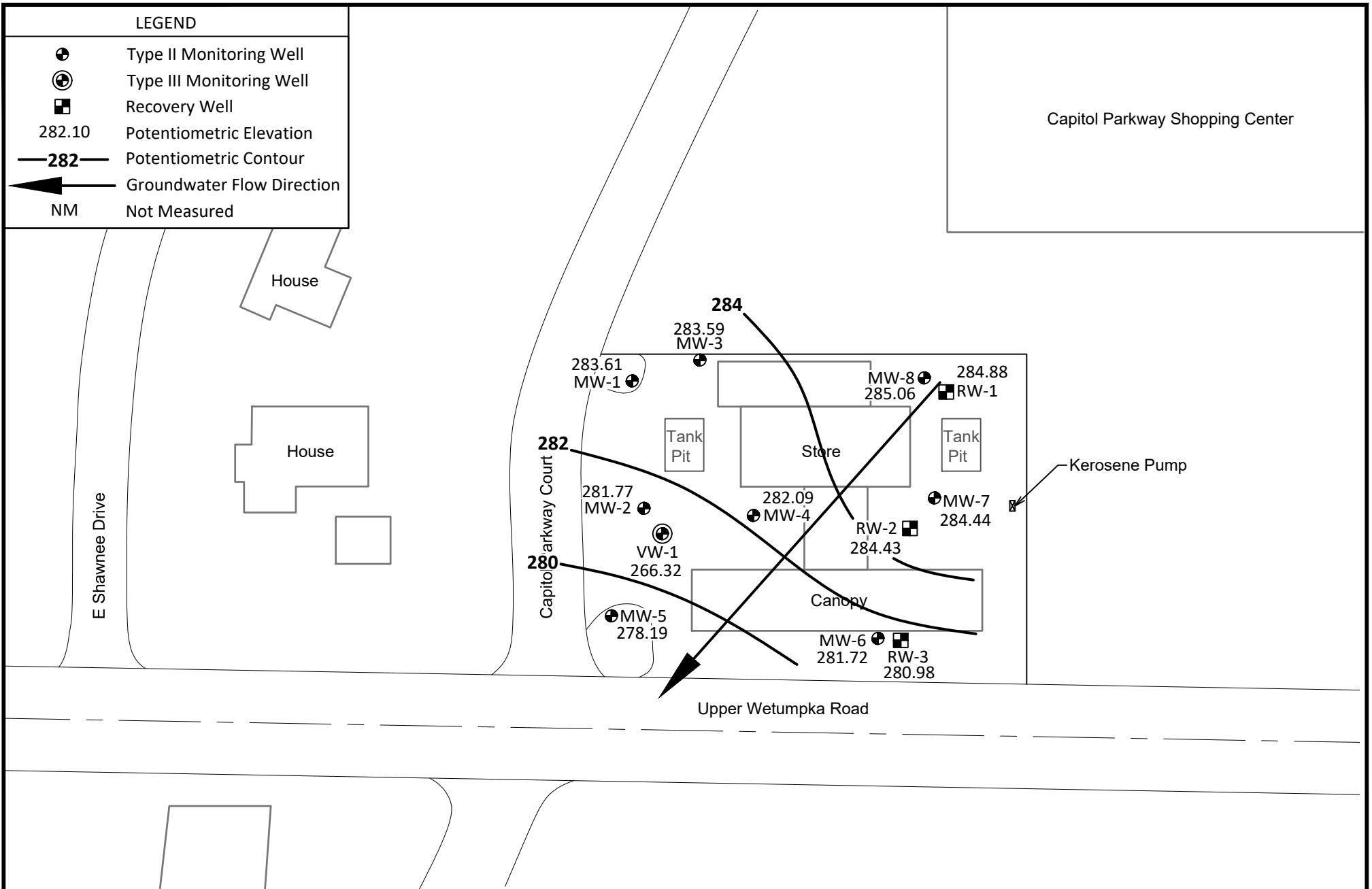
Mailing Address: 3 Riverchase Ridge

City: Birmingham State: Alabama Zip: 35244

Project Manager Signature:  Date: 4/25/19

LEGEND

-  Type II Monitoring Well
-  Type III Monitoring Well
-  Recovery Well
- 282.10 Potentiometric Elevation
-  Potentiometric Contour
-  Groundwater Flow Direction
- NM Not Measured



Engineering. Environmental. Answers.
www.cdge.com

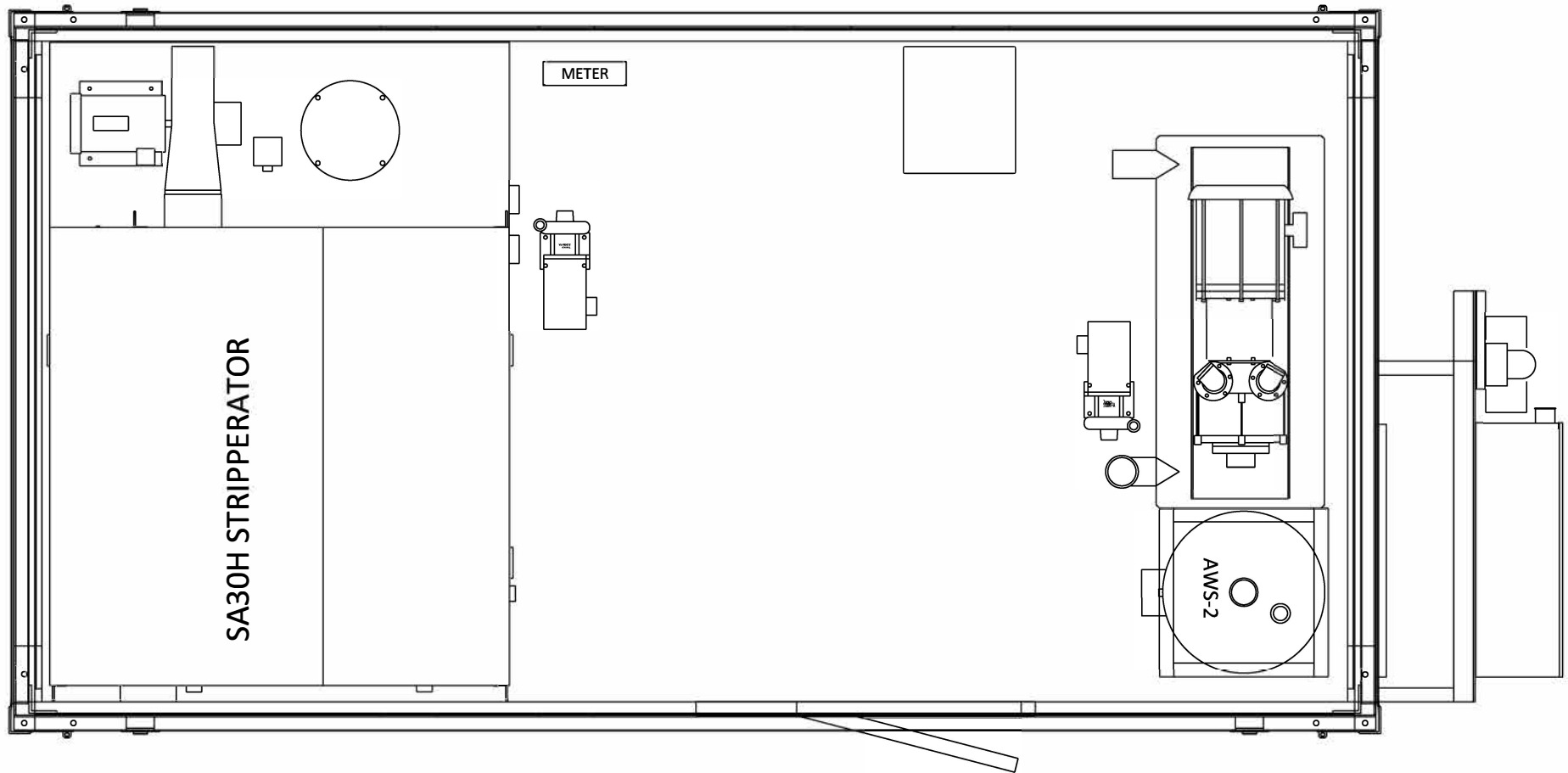
Potentiometric Surface Map
March 26, 2019

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL



Approximate Scale in Feet





Engineering. Environmental. Answers.
www.cdge.com

Typical MPE System Diagram

Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Montgomery County, AL

NOT TO SCALE



Engineering. Environmental. Answers.

Operation and Maintenance Form



Engineering. Environmental. Answers.

OPERATION & MAINTENANCE RECORD

CLIENT: Krish-R, Inc.
LOCATION: Capitol Heights Mini Mart
1705 Upper Wetumpka Road
Montgomery, Alabama

Page: 1 of 1
File Number: _____
Event Date: _____
Field Personnel: _____

SYSTEM DATA	
TOTAL SYSTEM HOURS	
EXHAUST TEMPERATURE	
AMBIENT TEMPERATURE	
EFFLUENT CARBON (ppm)	
INFLUENT CARBON (ppm)	
COMPRESSOR PRESSURE (psi)	
CASING VACUUM "Hg RW-1	
CASING VACUUM "Hg RW-2	
CASING VACUUM "Hg RW-3	
CASING VACUUM "Hg RW-4	
CASING VACUUM "Hg RW-5	
CASING VACUUM "Hg RW-6	
CASING VACUUM "Hg RW-7	
CASING VACUUM "Hg RW-8	
CASING VACUUM "Hg RW-9	
CASING VACUUM "Hg RW-10	
TOTAL EFFLUENT DISCHARGE (gal)	
STRIPPER PRESSURE ("H2O)	
AMBIENT FLOW ("H2O) (2" PVC)	

FIELD NOTES: _____



Engineering. Environmental. Answers.

Quality Assurance / Quality Control Plan

QA/QC MONITORING/SAMPLING PLAN

FIELD ACTIVITIES

Air Sampling

Air samples are collected utilizing an air sampling pump system or Summa canister. The pump is primed, prior to collection of each sample, to displace any trapped air or gases with the targeted air make-up. The air is drawn in and exits through polyethylene tubing. The sample is collected directly into and stored in a Tedlar air/gas sampling bag or Summa canister. The sample bag or canister is provided to CDG by the analytical laboratory. The air sampling pump system is also used to extract air/gases from a vacuum and drive them into a field-screening instrument. The air sample collection and screening protocols are described below.

Air Screening

Air screening is conducted to provide a field indication of the levels of hydrocarbon gases in vapor phase. The air/gases are screened with an organic vapor analyzer, equipped with a methane filter (as applicable). The field instrument is field calibrated to a gas standard of known concentration. Field air/gas samples are screened at ambient conditions and the data recorded. The field screening test form contains the following information:

- Project name (client and location);
- Data table number;
- Personnel collecting samples;
- Field screening instrument used and I.D. number;
- Calibration information;
- Description of field screening method;
- Sample identification information; and
- Screening data, including time collected/screened, ambient temperature/results.

Air Sampling Protocols

Air samples designated for laboratory analysis are collected in Tedlar bags or a Summa canister. The sample bags or canister are provided to CDG directly by the analytical laboratory. If Tedlar bags are used, two Tedlar bags are filled for each sample, in the event the bags are damaged during shipment. Upon collection, each sample bag is immediately placed in a cooler or other secure shipping container, following laboratory instructions and appropriate chain of custody documentation. The samples are sent direct to the laboratory via overnight carrier, or are picked up from the CDG office by a representative of the laboratory.

Groundwater Monitoring/Sampling Activity Protocols

Groundwater monitoring/sampling includes the following associated activities:

- 1) Measurement for the presence of free product;
- 2) Measurement of static water level;
- 3) Calculation of standing water volume (in well);
- 4) Sample collection; and
- 5) Equipment decontamination.

Groundwater sampling parameters are recorded in the field on a monitor well sampling record form. The details for each of the above referenced monitoring/sampling activities are described in the following sections.

Free Product Detection and Measurement

The presence of free product is measured prior to free product recovery, and purging/sampling the selected monitor well. Free product is detected/measured using a hydrocarbon/water interface probe. The probe is lowered slowly into the well until an instrument tone is heard (a constant tone indicates that free product is present, and an intermittent tone indicates that water is present). The point at which a constant tone is first heard is considered the top of free product. The measurement from the top of the PVC well casing to the top of free product is recorded. The measurement is checked at least twice. The probe is then slowly lowered further into the well until an intermittent tone is heard (indicating that the probe has passed through the free product layer into the underlying groundwater interval). Once the intermittent tone is encountered, the probe is slowly raised until the constant tone is again indicated. This point is considered the interface between the floating free product layer and the groundwater table. The measurement from the top of the PVC casing to the interface is recorded. This measurement is also checked at least twice.

The free product thickness is determined by calculating the difference between the measurement to the top of free product and the measurement to the free product/water interface (the interface probe measures free product and water levels to an accuracy of 0.01 feet). If free product is identified by the interface probe, a clear bailer is lowered into the well to collect a sample for visual confirmation of the free product. Remarks regarding visual characteristics of the free product are recorded (black, clear, colored, etc.).

Calculation of Standing Water Volume

The standing water volume in a monitor well is calculated using the equation:

$v = 3.14 \times r^2 \times l$ (where v = well volume, r = well radius, and l = length of the column of water in the well).

The column of water in the well can be calculated using the equation:

$l = w - d$ (where w = distance from the top of casing to the bottom of the well and d = distance from the top of casing to the top of the water).

Well Evacuation

Well evacuation is initiated after the static water level is measured and the standing water volume has been calculated. Well evacuation is conducted by either using a new disposable (single-use) bailer, a well-dedicated PVC bailer, or a surface mounted pneumatic operated diaphragm pump (a diaphragm pump is only used in deep wells (greater than 25 feet) or in wells that yield such large volumes that hand-bailing is not practical).

Well evacuation with a bailer is performed by attaching a new nylon line to the bailer, and then lowering the bailer in to the well until the bailer is submerged. The bailer is then retrieved from the well in such a manner that the bailer and nylon line do not contact the ground or surrounding vegetation (to prevent contaminating the bailer or line). The water removed from the well is poured into a graduated bucket so that the amount of water removed can be determined. This procedure is repeated until three well volumes of water are removed, or until the well is purged dry. For wells that recharge very slowly, the purge water is limited to one well volume. The volume of groundwater purged from each well will be recorded.

Well evacuation with a diaphragm pump is conducted by lowering disposable tubing (hose) into the well, to sufficient depth. For deeper wells, a PVC pipe, equipped with a foot valve (to stage-lift the water out of the well) will be employed. The piping will be well-dedicated to prevent cross-contamination. Pumping will be performed until at least three well volumes are recovered (purge volume will be recorded).

Petroleum contaminated water (PCW) purged from wells in conjunction with groundwater monitoring/sampling activities will be containerized on-site in labeled 55-gallon drums. PCW will be removed periodically from the site to an appropriate disposal/treatment/recycling facility approved by the ADEM. Records will be maintained as to the volume of PCW accumulated at the site, and identification labels will be affixed to PCW containers. Prior to disposal, samples will be collected and analyzed as required by the ADEM and the disposal/treatment/recycling facility. No waste will be removed from the site without ADEM knowledge/approval.

Groundwater Sample Collection

Groundwater samples are collected from monitor wells not containing free product, unless otherwise directed by the ADEM. Groundwater sampling is performed using a new disposable bailer for each sampled well. The disposable bailers are purchased in individually wrapped packages, and are not opened until ready to use. Once opened, the bailers are attached to a length of new nylon string. The bailer and string are not allowed to touch the ground or vegetation, and are disposed of after each well.

Sampling is accomplished by slowly lowering the bailer into the well to a depth where the bailer is almost completely submerged. The bailer is then slowly retrieved from the well to minimize agitation of the sample. Once collected, the water sample is immediately transferred (poured slowly to minimize agitation and formation of air bubbles) into the designated sample containers.

Groundwater samples collected for BTEX/MTBE analysis (volatile organics) are poured very slowly down the inside of the sample vial to avoid aeration. The sample vials, consisting of 40 ml glass with a Teflon septum cap, are shipped to CDG directly from the analytical laboratory. The groundwater sample is added to the vial until a convex meniscus is formed across the top of the vial. The Teflon septum cap is placed on the vial and the vial is upended to check for trapped air bubbles. If bubbles are present, the sample container is opened, and topped off again until an air-free sample is obtained. If the vial cannot be closed "air-free" after three tries, it is discarded. Two samples are collected for each BTEX/MTBE (volatile) analysis. The preservation employed for BTEX/MTBE (volatile) analysis will include either of the following (depending on holding time constraints):

- Cool collected sample to 4°C and maintain (7 day holding time), or
- Add 4 drops concentrated HCl to sample vial (typically the acid is pre-added by the laboratory to the sample vial) and then cool sample to 4°C and maintain (14 day holding time).

Immediately following collection of each groundwater sample, the sample is labeled, placed in bubble pack (to prevent the glass vial from breaking during shipping), and stored in a well-iced ice chest. Each sample label includes the site location, sample identification number, name of collector, date/time of collection, and parameter(s) requested.

Following collection of all samples, the iced chest will be sealed and transported to the laboratory following appropriate chain of custody protocols (refer to description of Chain of Custody protocols provided below).

Decontamination of Groundwater Sampling Equipment

All equipment used for groundwater sampling is either well-dedicated or is used only once and disposed of. As a result, cleaning/decontamination of sampling equipment is minimal.

QA/QC PROCEDURES DISCUSSION

Chain of Custody

Sample custody begins with the subcontracted laboratory when sample kits are prepared and shipped for CDG use at a specified project location. Responsibility for

sample container materials and preparation lies with the subcontracted laboratory. Sample containers and kits are normally shipped to CDG by common carrier or are dropped off by a laboratory representative. Upon receipt of the kits, CDG personnel complete an inventory of the contents to confirm that the containers, etc. are adequate for the number of wells and specified analytes. Sample bottles may be pre-labeled and contain the proper preservative. The individual sample vials and/or other sample containers are not opened until used in the field. CDG will secure the sample kits inside the office until the specific sampling project is to be performed.

The samples remain in the custody of the CDG representative until delivered to the subcontract laboratory or dispatched via common carrier for shipment to the laboratory. In cases where samples leave the direct control of CDG personnel, such as shipment to a laboratory by a common carrier (FedEx, UPS, etc.), a seal will be provided on the shipping container or individual sample bottles to ensure that the samples have not been opened or otherwise disturbed during transportation.

To establish and maintain the documentation necessary to trace sample possession from the time of collection, a chain of custody record will be completed and will accompany every sample. The record contains the following types of information:

- Sample number
- Signature of collector
- Date and time of collection
- Sample type (soil, groundwater, air, etc.)
- Identification of well
- Number of containers
- Parameters requested for analysis
- Required detection limit
- Signature of person(s) involved in the chain of possession.

Field QA/QC Program

Various types of field blanks are collected to verify that the sample collection and handling process has not affected the quality or integrity of the samples.

- 1) Trip Blanks – A trip blank is a field blank that is transported from the laboratory to the sampling site, handled in the same manner as other samples, and then returned to the laboratory for analysis in determining QA/QC of sample handling procedures. The trip blank is prepared in the laboratory with distilled/organic free water and is utilized at a frequency of 1 trip blank for each cooler (or other shipping container) used to transport samples from the laboratory to the field and back to the laboratory.

- 2) Duplicate Sample – Duplicate samples are collected simultaneously from the same source, under identical conditions, into separate sample containers. These samples provide a check on the sampling techniques as well as laboratory equipment. Duplicate samples are only collected on groundwater samples at a frequency of one sample per sampling event.

The results of the analysis of the blanks will not be used to correct the groundwater data. If contaminants are found in the blanks, an attempt to identify the source of contamination will be initiated and corrective action, including re-sampling if necessary, will be evaluated.

After completing a sampling program, the field data package (field logs, calibration records, chain of custody forms, etc.) will be reviewed for completeness and accuracy. Some of the items considered in the Field Data Package Validation Procedure include but are not limited to the following:

- A completeness review of field data contained on water and soil sampling logs;
- A verification that sampler blanks were properly prepared, identified, and analyzed;
- A check on field analyses for equipment calibration and condition; and
- A review of chain of custody forms for proper completion, signatures of field personnel and the laboratory sample custodian, and dates.

Laboratory QA/QC Program

The selection of a contract laboratory can be directed either by the client or by CDG. In either case, the selection is typically based upon several facts, including cost; laboratory certification; quality data and reporting; and turn around time. The most critical factor in the selection of an analytical laboratory by CDG is the quality of data and reporting provided by the laboratory. Typically, the results of analytical laboratory testing dictate the activities conducted at a site. The activities conducted when selecting a laboratory include discussions with current and past customers, discussions with regulators, and review of laboratory QA/QC practices.

The normal turn around for samples will be two weeks for most samples. Prior to contracting a laboratory to conduct analysis, an estimate of the turn around time is obtained. If the expected turn around is in excess of three weeks then a backup laboratory is contacted to determine their availability. A decision of which laboratory to use in a particular instance is made on a case-by-case basis.

Once an analytical report is received by CDG, validation of the analytical data package will be performed. The Analytical Data Package Validation procedure will include but is not limited to the following:

- A comparison of the Data Package to the reporting level requirements designed for the project, to ensure completeness;
- A comparison of sampling dates, sample extraction dates, and analysis dates to determine if samples were extracted and/or analyzed within the proper holding times' as failure in this area may render the data unusable;
- A review of analytical methods and required detection limits to verify that they agree with set standards; as failure in this area may render the data unusable;
- A review of sample blanks to evaluate possible sources of contamination. The preparation techniques and frequencies, and the analytical results (if appropriate) will be considered; and
- A review of blanks (trip blanks, reagent blanks, method blanks, and extraction blanks) to assure that they are contamination free at the lowest possible detection limit. All blank contaminants must be explained or the data applicable to those blanks will be labeled suspect and may only be sufficient for qualitative purposes.
- A review of detection limits, to ensure sample results are accurate to below the levels specified as ADEM Initial Screening Levels.
- A review of data "qualifiers" reported by the laboratory for significance to the results.



Engineering. Environmental. Answers.

Site Health and Safety Plan

Site Health and Safety Plan

**Capitol Heights Mini Mart
Montgomery, Montgomery County, Alabama
ADEM Facility ID# 23245-101-006835
ADEM Incident No. UST17-06-04**

Prepared For:

**Krish-R, Inc.
1336 Hallwood Lane
Montgomery, Alabama 36117**

Prepared By:

**CDG Engineers & Associates, Inc.
3 Riverchase Ridge
Hoover, Alabama 35244**

Table of Contents

	Page No.
1.0 Introduction	1
2.0 Purpose	1
3.0 Key Personnel and Responsibilities	1
4.0 Scope of Work.....	2
4.1 Installation Activities	2
4.2 Operation & Maintenance Activities	2
5.0 Chemical Hazards.....	3
5.1 Gasoline	3
5.2 Hazard Identification	3
5.3 Hazard Prevention	4
5.4 Symptoms and First Aid Procedures.....	4
6.0 Equipment/Operational Hazards.....	5
6.1 Hazard Identification	5
6.2 Hazard Prevention	6
6.3 Symptoms and First Aid Procedure	7
7.0 Temperature Hazards	7
7.1 Heat	7
7.1.1 Hazard Identification	7
7.1.1.1 Heat Fatigue.....	8
7.1.1.2 Heat Rash.....	8
7.1.1.3 Heat Collapse	8
7.1.1.4 Heat Cramps	8
7.1.1.5 Heat Exhaustion	8
7.1.1.6 Heat Stroke	9
7.1.2 Hazard Prevention	9
7.1.3 Symptoms and First Aid Procedures	10
8.0 Explosion/Electrocution Hazards	10
8.1 Explosion	11
8.1.1 Hazard Identification	11
8.1.2 Hazard Prevention	11
8.2 Electrocution.....	12
8.2.1 Hazard Identification	12
8.2.2 Hazard Prevention	12
8.2.3 Symptoms and First Aid Procedures	12

9.0	Miscellaneous Hazards	13
9.1	Hazard Identification	13
9.2	Hazard Prevention	13
9.3	Symptoms and First Aid Procedures	14
10.0	Additional Precautions.....	14
10.1	Personal Protective Equipment	14
10.2	Signs, Signals, and Barricades.....	15
10.3	Fire Protection and Prevention	15
10.4	Storage and Decontamination	16
11.0	Emergency Contingency Plan	16
11.1	Notification/Reporting Procedures.....	16
11.2	Hazardous Substance Release.....	17
11.3	Personnel Injury	17
11.4	Evacuation Plan	17
11.5	Spill Prevention and Response	18
11.6	Emergency Communication	18
11.7	Contingency Contacts.....	18
11.8	Medical Facility.....	19

1.0 Introduction

This Health and Safety Plan (HASP) has been prepared specifically for corrective action activities to be conducted by CDG Engineers & Associates, Inc. (CDG) for the Capitol Heights Mini Mart facility in Montgomery, Montgomery County, Alabama. These activities include all fieldwork necessary to conduct soil and groundwater remediation of petroleum hydrocarbons at the site.

2.0 Purpose

This HASP describes the preventative measures, person protection, and safety procedures to be followed by CDG personnel and subcontractors during all field activities. The HASP has been prepared in accordance with and meets the requirements of the Occupation Safety and Health Administration (OSHA) General Safety Standards for industry under 29 CFR 1910 and construction under 29 CFR 1926, the joint NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, dated October 1985, and NFPA Safety Guidelines. Should any unexpected conditions arise, the HASP will be amended to accommodate site specific conditions.

3.0 Key Personnel and Responsibilities

All CDG personnel have received an initial 40-hour HAZWOPER certification, which is updated annually through an 8-hour refresher course. This training course meets the requirements of the OSHA 29 CFR 1910.120 standards. CDG personnel assigned to the project include:

NAME	TITLE	RESPONSIBILITIES
David Dailey	Professional Engineer/ Corporate HSO	Overall management of entire project from beginning to completion. Responsible for preparation and implementation of the HASP and reporting of all hazard incidents to appropriate enforcement agencies. Coordinates and oversees all field activities.
Trent Carnley	Environmental Scientist/ Site HSO/Project Manager	Performs all field activities and is responsible for recognizing site hazards and reporting hazard incidents to Corporate HSO.

4.0 Scope of Work

Work to be performed will include installation and sampling activities.

4.1 Installation Activities

Installation activities generally involve preparing the site for installation activities and also the construction of the MPVE unit onsite. More specifically this will include:

- Preparing the site for work to be performed
- Saw-cutting concrete surface, excavating, and installing well vaults
- Installing polyvinyl chloride (PVC) extraction piping and subsurface utility lines
- Installing piping connections from extraction piping to wellhead
- Overseeing placing and leveling of remediation system
- Completing all piping connections from extraction and utility lines to remediation unit
- Completing all electrical connections
- Installing concrete block security fence
- Inspecting rotation on all electric motors
- Inspecting PVC piping, extraction lines, treatment system, and associated connections for leaks at start up

4.2 Operation and Maintenance Activities

Subsequent to the construction and installation of the MPVE unit, the unit must periodically undergo inspections or maintenance. CDG field personnel will inspect the unit on a weekly basis, taking certain instrument readings necessary to determine the progress of the remediation being performed at that particular site. Maintenance of the unit is performed on an as needed basis. The following applies to operation and maintenance activities associated with the MPVE unit:

- Inspecting proper working condition of telemetry system
- Lubricating motors
- Inspecting piping for leaks
- Inspecting belts on Liquid Ring Vacuum Pump (LRVP) system
- Periodic cleaning of equipment and components
- Periodic inspections of electrical connections

- Measuring induced vacuum in on site monitoring wells
- Removing silt and sludge buildup from knockout pot air stripper, filtration system and other system components
- Measuring air flow from MPVE unit
- Measuring liquid levels in wells
- Sampling effluent for discharge parameters
- Measuring volume of liquids removed and discharged

5.0 Chemical Hazards

When conducting the aforementioned corrective action activities, the primary chemicals of concern are gasoline.

5.1 Gasoline and Diesel

Gasoline and diesel are substances to be potentially encountered in the soil and groundwater at the site. Gasoline components include benzene, toluene, ethylbenzene, and xylenes (BTEX). Diesel components may include anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene.

5.2 Hazard Identification

During the corrective action activities, many hazards or potential hazards may be encountered when dealing with gasoline or diesel. This section serves as a guideline in recognizing hazards associated with these chemicals that exist or may potentially arise during field activities. Recognition is the first step in eliminating exposure to these hazards.

Occasionally methyl-tertiary butyl ether (MTBE) is encountered. MTBE has been used since 1979 as an oxygenate to gasoline in order to decrease carbon monoxide production in cars, particularly older model cars; however, MTBE has been determined to be a potential carcinogen. MTBE has low taste and odor thresholds, which can make a water supply non-potable even at low concentrations.

Exposure to MTBE will only be seen through exposure to gasoline containing MTBE and the effects of gasoline containing MTBE are relatively similar to gasoline not containing MTBE. The following are hazards associated with exposure to gasoline:

- Contact may irritate or burn the skin and eyes and absorption through the skin may be poisonous
- Vapors may be poisonous if inhaled and are irritating to the respiratory tract
- Vapors are an explosion hazard and may travel to a source of ignition and produce flashback
- A gasoline fire may produce irritating and poisonous gases
- Gasoline and diesel are flammable/combustible materials that may be ignited by heat, sparks, or flames, and a gasoline container may explode when exposed to heat or fire

The primary hazard associated with exposure to gasoline is the inhalation of vapors. The Material Safety Data Sheets (MSDS's) are presented in Attachment A.

5.3 Hazard Prevention

Preventing exposure to chemical hazards generally requires the use of personal protective equipment (PPE). Level D equipment will provide the protection necessary to prevent exposure to these hazards. Level D equipment is discussed further in Section 10.1, Personal Protective Equipment.

5.4 Symptoms and First Aid Procedures

Many of the constituents found in gasoline and diesel act as central nervous system (CNS) depressants. The following table includes first aid measures for CNS depressants, which affect a person through inhalation (breathing), dermal (skin), or ingestion (mouth) exposure. In addition, the eye can be very sensitive to exposure to chemicals and is therefore included in the following table:

ROUTES OF EXPOSURE	SYMPTOMS	TREATMENT
Inhalation	Dizziness, nausea, lack of coordination, headache, irregular and rapid breathing, weakness, loss of consciousness, coma	Bring victim to fresh air. Rinse eyes or throat with plenty of water, if irritated. If symptoms are severe (victim vomits, is very dizzy or groggy, etc.), evacuate to hospital. Be prepared to administer CPR if certified. Monitor victim for at least 48 hours.
Dermal	Irritation, rash, or burning	Flush affected area with water for at least 15 minutes. Apply clean dressing and get medical attention.
Ingestion	Dizziness, nausea with stomach, cramps, loss of consciousness, coma	Evacuate victim to hospital. Do not induce vomiting.
Eye	Redness, irritation, pain, impaired vision	Flush with an abundant amount of water for at least 15 minutes. If severe, seek medical attention immediately.

6.0 Equipment/Operational Hazards

The following sections will address the hazards, preventative measures, and first aid procedures associated with the drill rig, backhoes, and other heavy equipment. The drill rig used during these field activities generally requires the use of augers for probing. These augers are designed to rotate in a circular motion while being forced downward through the soil. Field personnel are required to assemble and disassemble these parts. Contact with these rotating parts is one recognized hazard. In addition, the machinery also contains parts that become increasingly heated during operation.

6.1 Hazard Identification

There are several hazardous associated with use of any type of drill rig and heavy machinery while performing corrective action activities. Generally during these field operations, the general public may become fascinated with the operation and approach the work area. All unauthorized personnel are required to remain 100 feet away from the work area. The site HSO officer will be responsible for keeping all unauthorized personnel away from the work area. The hazardous associated with the use of a drill rig or other heavy machinery is as follows:

- Gasoline vapors from nearby dispensers can potentially enter the diesel-operated engine thereby causing fire/explosion hazards
- Rotating augers may catch onto gloves or clothing thereby pulling hands arms into the rotating machinery
- Drilling equipment may rupture hydraulic hoses thereby releasing hydraulic fluids
- Engine and exhaust system of an engine are extremely hot during and following operation
- Potential contact with overhead and underground utilities
- Open excavations/boreholes can be the source of trips and falls
- Digging machinery such as backhoes may puncture subsurface utilities
- Operators of heavy machinery may be unable to locate pedestrians near the operating equipment; therefore, all field personnel are to remain with eye contact of the operator at all times during operation

6.2 Hazard Prevention

Hazards associated with heavy machinery can easily be avoided with additional planning. The key to avoiding these hazards includes being familiar with the equipment and the process. In addition, being familiar with and implementing the precautionary measures listed below may reduce or eliminate the risks of a hazardous situation.

- Wear hard hat when working near or around the machinery
- Wear safety glasses when performing maintenance to machinery or power tools
- Shut down the machine engine when repairing or adjusting equipment
- Prevent accidental starting of engine during maintenance procedures by removing or tagging ignition key
- Block wheels or lower leveling jacks and set hand brakes to prevent equipment from moving during drilling procedures
- When possible, release all pressure on hydraulic systems, drilling fluid systems, , and air pressure systems of heavy machinery prior to performing maintenance
- Know the location of the emergency shut-off switch for all equipment
- Avoid contact with engine or exhaust system of engine following its operation
- Avoid using gasoline or other volatile/flammable liquids as a cleaning agent on or around heavy machinery
- Replace all caps, filler plugs, protective guards or panels, and high-pressure hose clamps, chains or cables moved during maintenance prior to excavation
- Avoid wearing rings or jewelry during drilling or installation procedures
- Be aware of all overhead and underground utilities
- Avoid alcohol or other CNS depressants or stimulants prior to excavation
- Avoid contact with equipment parts during freezing weather. Freezing of moist skin to metal can occur almost instantaneously
- Shut all field operations during an electrical storm
- Do not operate heavy equipment within 20 feet of overhead power lines

6.3 Symptoms and First Aid Procedure

Hazards associated with heavy equipment were identified in Section 6.1. Unlike hazards associated with temperature or chemicals, symptoms will not be apparent with these types of hazards. In addition, these hazards will occur rapidly as opposed to over a period of time. Due to the size and composition of hydraulic vehicles, exposure to these hazards will range from extremely serious to life-

threatening; therefore CDG requires that exposed field personnel seek medical attention at the nearest medical facility and the Project Manager be notified immediately. A site location map to the nearest hospital is presented in Attachment B.

7.0 Temperature Hazards

Another hazard associated with corrective action activities involves working in extreme weather conditions. Temperatures in the Southeast USA during the spring, summer, and occasionally the fall seasons can vary from mild to extremely hot. During this season, extra precautions are necessary to prevent hazards associated with elevated temperatures, which result in various forms of heat stress. In addition, the Southeast is known for its rather mild winter condition; however, on occasion, the Southeast may experience freezing conditions; therefore, precautions are also necessary to prevent hazards associated with these extreme temperatures.

7.1 Heat

As stated in OSHA's regulatory guidelines for heat exposure operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for inducing heat stress. Additional factors to consider in the determination of heat stress on an individual include age, weight, degree of physical fitness, degree of acclimatization, metabolism, use of alcohol or drugs, and a variety of medical conditions such as hypertension (high blood pressure). The following sections will identify the hazards associated with heat stress, the measures needed in order to prevent exposure to these hazards, and first aid procedures in the event exposure to these hazards should occur.

7.1.1 Hazard Identification

Heat stress is a major hazard, especially for workers wearing protective clothing. Depending on the ambient conditions and the work being performed, heat stress can occur very rapidly- within as little as 15 minutes. The key to preventing excessive heat stress is educating personnel on the hazards associated with working in heat and the benefits of implementing proper controls and work practices. The hazards associated with heat stress range from heat fatigue (mild discomfort) to heat stroke (extreme danger, which may result in death, and are discussed in the following sections.

7.1.1.1 Heat Fatigue

Heat fatigue occurs due to a lack of acclimatization (adjusting one's tolerance to work in elevated temperatures). Acclimatization is a gradual process. This process should include all field personnel being permitted to work in elevated temperatures in specified increments. On a daily basis, the maximum allowable work period should gradually be increased until the worker is able to perform his/her duties more proficiently under these conditions. The use of an acclimatization program is recommended in the regulatory guidelines established by OSHA.

7.1.1.2 Heat Rash

Heat rash (prickly heat) is the most common heat stress factor, and may result from continuous exposure to heat or humid air where the skin remains wet due to lack of evaporation. Under these conditions, sweat ducts become plugged, and a skin rash appears, generally in areas where clothing is restrictive. This uncomfortable rash can be prevented by resting in a cool place during breaks and by implementing good daily personal hygiene.

7.1.1.3 Heat Collapse

Heat collapse is commonly referred to as "fainting." Fainting generally occurs when the brain does not receive enough oxygen. As a result of this condition, the exposed individual may lose consciousness. Heat collapse is rapid and unpredictable; therefore, acclimatization is an important factor in preventing this condition.

7.1.1.4 Heat Cramps

Heat cramps are muscular spasms, which usually occur in the abdomen or limbs due to loss of electrolytes following profuse sweating. Cramps are caused by either too much or too little salt intake. During the sweating process, salt exits the body; therefore, without the proper replenishment, the body experiences an electrolyte imbalance thereby inducing heat cramps. Thirst cannot be relied upon as a guide to the need for water. When working in hot environments, water must be replenished every 15 to 20 minutes.

7.1.1.5 Heat Exhaustion

Heat exhaustion is a result of overexertion in hot or warm weather. It is highly possible for an onsite worker to experience heat exhaustion due to the use of worker-protective coveralls, boots, gloves, and

respirator protection, even when ambient temperatures are mild. Fainting may also occur with heat exhaustion. This can become an extreme hazard if operating heavy machinery.

Caution: Individuals with heart problems or on a “low sodium” diet who work in these environments should consult a physician and Corporate HSO prior to working in these conditions.

7.1.1.6 Heat Stroke

Heat stroke is the most severe form of heat stress. The body’s temperature control system is maintained through sweat production. Perspiration is a cooling process for the body and keeps the body core temperature within a stable range. During heat stroke, sweat production is inhibited and the body temperature begins to rapidly rise. Brain damage and death may occur if body core temperature is extremely elevated and is not reduced.

7.1.2 Hazard Prevention

Hazards associated with temperature extremes can also be prevented with additional planning and preparation. The hazards associated with temperature can range from heat fatigue to heat stroke as described previously in Section 7.1.1 Measures to ensure the prevention of temperature hazards are as follows:

- Adhere to acclimatization process by exposing field personnel to progressively longer periods of time in hot environments.
- Schedule work for early morning or evening during warm weather
- Work in shifts; limit exposure time of personnel and allow frequent breaks
- Have cool liquids at an Exclusion Zone border for exposed personnel to continuously replace body fluids. As stated in the previous section, OSHA recommends that fluids, preferably water and/or a water-electrolyte solution be replenished every 15 to 20 minutes.
- Avoid caffeine and alcoholic beverages both during work hours and 24 hours prior to performing field activities

The site HSO or designee should continually monitor personnel for signs of heat stress. If any signs of heat disorders are apparent, all field personnel must immediately rest and replenish fluids until body core temperature is lowered and remains stable.

7.1.3 Symptoms and First Aid Procedures

As discussed previously in Section 7.1.1, hazards associated with heat stress range from heat fatigue to heat stroke. Taking precautionary measures to ensure that personnel are not exposed to extreme temperatures for long periods of time can prevent these hazards. First aid measures for heat fatigue, heat rash, and heat collapse include taking frequent breaks so that the body core temperature can cool down. The following table includes first aid measures for signs of overexposure to heat.

TEMPERATURE HAZARDS	SYMPTOMS	TREATMENT
Heat Fatigue	Impaired performance of skilled sensorimotor, mental or vigilance jobs	No known treatment. Victim should be placed under cooler conditions until body core temperature lowers.
Heat Rash	Rash due to plugged sweat ducts, generally where clothing is restrictive	Keep dry towels or paper towels at the site to dry skin when excessive sweating occurs. Rash usually disappears when affected individual returns to cooler environment.
Heat Collapse	Loss of consciousness	Attempt to awaken individual. Relocate victim to a cooler area until body core temperature lowers and replenish fluids. Victim should rest for a few days.
Heat Cramps	Uncontrollable muscle spasms	Apply warm, moist heat and pressure to reduce pain. Give electrolyte drinks by mouth. Victim should intake additional potassium (Bananas are good potassium source).
Heat Exhaustion	Pale, clammy skin, profuse perspiration, weakness, headache, and nausea	Get victim into shade or cooler place. Immediately remove any protective clothing. Victim should drink plenty of fluids. Victim should lie down with feet raised. Fan and cool victim with wet compresses. If vomiting occurs, transport to hospital. Victim should rest for a few days.
Heat Stroke	Pale, dry skin due to lack of perspiration, weakness, unconsciousness	Immediately take precautions to cool body core temperature by removing clothing and sponging body with cool water, or placing in tub of cool water until temperature is lowered sufficiently (102°F). Stop cooling and observe victim for 10 minutes. Once temperature remains lowered, dry person off. Use fans or air conditioning, if available. Do not give the victim stimulants. Transfer to medical facility. Under no condition is the victim to be left unattended unless authorized by a physician.

8.0 Explosion/Electrocution Hazards

As stated previously in Section 4.1, extensive efforts are made in order to determine the location of subsurface utilities prior to corrective action activities. Efforts are made to obtain the location of underground utilities through the Line Locator Services, and utility companies are notified in advance to perform a site inspection and utility marking; however, the potential for a subsurface utility to go unnoticed exists. Therefore, the hazards associated with exposure to these utilities are identified and preventative measures and first aid procedures are discussed further in the following sections.

8.1 Explosion

Primarily when dealing with subsurface utilities, two potentially life-threatening hazards exist. The first hazard identified in association with subsurface utilities during excavation activities are discussed further in the following section.

8.1.1 Hazard Identification

The main hazard associated with puncturing a subsurface utility gas line is explosion. By releasing gas (usually natural gas, which is generally methane gas or propane gas) into the atmosphere, explosive conditions are favorable; therefore, ignition sources must be immediately eliminated in the event a gas release occurs. Due to the flammability of gasoline, ignition sources will be minimized; however, the engines are needed during field activities. Therefore, the only alternative to reducing the explosion hazard is to stop the release as soon as possible. However, when dealing with gases under pressure, the volatilization process may occur at such a rapid speed that an explosive situation is inevitable.

8.1.2 Hazard Prevention

Preventative measures are ensured prior to field activities. These measures generally encompass locating subsurface utilities. In addition, CDG will request local utility companies to perform site inspections and mark all subsurface utilities. In addition to this notification, if a particular subsurface utility is not identified and CDG suspects the utility to exist, CDG will take additional precautionary measures to ensure the suspected utility does not exist. These measures generally include locating utility meter boxes, etc. In addition, a field technician or subcontractor will generally probe the ground with a small rod in order to possibly identify the existence of subsurface utilities. This is conducted usually when machinery reaches 2-3 feet below the ground surface (ft-bgs).

8.2 Electrocutation

8.2.1 Hazard Identification

The main hazard associated with puncturing a subsurface electrical line or coming into contact with an overhead power line is electrocutation. When dealing with electricity, all things are classified as either conductors or insulators. Conductors allow electricity to pass through them while insulators prevent electricity to pass through. Examples of conductors are metals, wood, and water, and examples of insulators are rubber and PVC. Humans are also classified as conductors; therefore, contact with electrical sources can be fatal.

Because the heavy machinery is metal, which has been classified as one of the best sources of electrical conduction, contact with exposed electrical lines will allow current to flow. The National Electrical Code (NEC) has determined that 20 milliamps (mA) of current can be fatal. For comparison, a common household circuit breaker may conduct 15, 20, or 30 amps of electrical current.

8.2.2 Hazard Prevention

As stated previously in Section 8.1.2, preventative measures to locate subsurface and overhead electrical lines prior to corrective action activities are required by CDG. CDG will notify local utility companies to provide a site inspection and mark any existing subsurface electrical lines. In addition, CDG will contact the local power provider to insulate overhead lines if necessary. When dealing with the electrical components of the dewatering system, the following precautionary measures may prevent exposure to electrocutation:

- Avoid contact with exposed connections/wiring and other related components
- If unfamiliar with the system, do not attempt contact with any component
- Call the Project Manager if unsure of any connections associated with the operations of the system.

8.2.3 Symptoms and First Aid Procedures

As discussed previously in Section 8.2.1, the hazard associated with puncturing subsurface electrical utilities and contacting electrical components of dewatering system is electrocutation. The primary route of exposure is contact. The transmission of electricity is allowed because the metal equipment serves as a conductor for electrical current. Symptoms and treatment for exposure to electrical current is presented in the following table:

Caution: NEVER attempt to dislodge or remove someone that is contacting a high voltage line. Use an insulating material (PVC) to release the victim from the electrocution source.

9.0 *Miscellaneous Hazards*

The last hazard identified when performing corrective action activities has been classified as miscellaneous hazards due to the variety of these hazards. These hazards generally are nothing more than nuisances and with additional planning should be entirely avoidable; however, there are instances in which exposure to these hazards will occur. Therefore, these hazards are identified and preventative measures and first aid procedures are discussed in further detail in the following sections.

9.1 *Hazard Identification*

Occasionally, exposure to common nuisances may potentially result in a life-threatening situation. For example, a wasp or bee sting for some individuals only causes irritation or localized soreness; however, to others with little tolerance for wasp or bee venom, an allergic reaction can result which could potentially lead to death if not treated immediately. Therefore, allergic reactions to these insects have been identified as a potential hazard. In addition to the insects, contact with black widow spiders (red hourglass), brown recluse spiders (violin shape on back), and snakes are also potential hazard.

9.2 *Hazard Prevention*

Prevention, with regards to miscellaneous hazards, is more difficult to plan ahead. Generally, prior to conducting corrective action activities, the primary location for the activities has been established; therefore, barricades such as cones and company vehicles can be placed around the work area to prevent exposure to incoming and ongoing vehicles. However, the limitation to using cones is that they are often small and unnoticeable to drivers once inside the vehicles; therefore, the best prevention with regards to this miscellaneous hazard is to constantly be aware of your surroundings. This preventative measure can also be applied to exposure to insects, snakes, and spiders. Be aware of your surrounding when working around dark, secluded areas such as cracks and crevices, where snakes, spiders, and mice like to hide.

9.3 *Symptoms and First Aid Procedures*

If an employee or subcontractor shows any signs of an allergic reaction (anaphylactic shock, hives, or difficulty breathing) to a sting or bite, immediately seek medical attention at the nearest hospital. In the event that an operating vehicle strikes a person, seek medical attention immediately. In the meantime, a first aid kit and eye wash bottle will be provided by CDG and should be kept in all company

vehicles. If field personnel are aware of their allergic reactions to insect bites, CDG requires that medication be kept on hand during field activities and at least one other field technician be made aware of the medication in the event of an allergic reaction should occur.

10.0 Additional Precautions

Additional precautions have been implemented in order to ensure overall safety for all field personnel. The safety protocols listed in this segment are to be considered the minimum requirements to be met by all field personnel engaging in corrective action activities.

10.1 Personal Protective Equipment

PPE is the most effective measure to prevent exposure to chemical hazards. There are four levels of PPE protection ranging from Level A to Level D equipment. Level A protection serves as the most conservative protective equipment, and Level D protection serves as the least conservative protective equipment. These levels are described further in the following table:

LEVELS OF PPE PROTECTION	PPE REQUIREMENTS
Level A	Worn when the highest level of respiratory, skin, and eye protection is necessary.
Level B	Worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is necessary.
Level C	Worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is necessary.
Level D	Refers to work conducted without respiratory protection. This level should be used only when the atmosphere contains no known or suspected airborne chemical or radiological contaminants and oxygen concentrations are between 19.5 % and 23.0%

Level D protective clothing, as indicated below, shall be considered the minimum requirements for installation and excavation operations:

- Hard hat
- Coveralls*
- Non permeable gloves
- Steel-toe, non-permeable boots
- Hearing protection*
- Safety goggles (chemical)*

*These items are mandatory on an “as needed” basis. Generally, normal site conditions do not warrant the use of this equipment; however, under certain conditions where large amounts of free product are encountered, the use of coveralls and safety goggles may be warranted. Safety goggles and hearing protection are mandatory when near the drill rig to reduce stress on the ear and also prevent objects from the soil or drill rig from lodging in the eye.

Equipment may be upgraded to Level C depending on the site conditions and/or monitoring results. Level C protection, in addition to Level D protection, includes the following:

- Rubber/chemical resistant outer gloves
- Face-shield if splash hazards exist
- Outer disposable booties
- Half-mask respirator

10.2 Signs, Signals, and Barricades

As stated previously in Section 9.1, corrective action activities are generally conducted at retail gasoline facilities and convenience stores, and are therefore, high traffic areas. All CDG field personnel must be aware of his/her surroundings at all times. In addition, the items listed below will be provided to secure the area in order to protect all field personnel as well as the general public.

- Utilize barricades to protect workers, pedestrians and vehicles from work activities
- Post area for “NO SMOKING”
- Utilize cones to protect workers from incoming and ongoing vehicles

10.3 Fire Protection and Prevention

As stated previously in Section 5.1, gasoline is a highly flammable substance. CDG requires that the work area be posted with “NO SMOKING” signs in an attempt to prevent fires from occurring; however, as a secondary precaution CDG plans to implement the following:

- Maintain a 20 lb. ABC Dry Chemical fire extinguisher on site at all times
- Eliminate ALL ignition sources in the vicinity of any releases
- The contractor will clean up all small spills using absorbent materials or by pumping

10.4 Storage and Decontamination

During the corrective action activities, impacted soils will be encountered. Groundwater will be treated and pumped to an NPDES outfall. Contaminated soil will be temporarily stored until transported for disposal. Decontamination procedures will be implemented should chemical exposure occur. The procedures are detailed below:

- Avoid contact with liquid gasoline or diesel
- Place contaminated soil on visqueen and cover once removed from the excavation
- Change any product contaminated soil immediately
- Wash any contaminated skin surfaces immediately with soap and water

Caution: All personnel are required to wash hands at the completion of work, before and after restroom use and before eating in order to prevent dermal contact with or ingestion of contaminants encountered during field activities.

11.0 Emergency Contingency Plan

If an incident occurs that requires declaring an emergency, all personnel will assemble at a designated emergency meeting location for further instruction. Arrangement for decontamination, evacuation and/or transport will be made at that time. The client and appropriate CDG personnel will be notified of the incident as soon as possible.

11.1 Notification/Reporting Procedures

In the event of an emergency, CDG Project Manager will be notified as soon as possible regarding the nature of the incident and emergency service contact will be notified as needed (see Section 11.7, Contingency Contacts). It is the responsibility of the Site HSO to report all incidents to the CDG Corporate HSO so that the required reporting procedures may be implemented.

11.2 Hazardous Substance Release

In the event that potentially hazardous substances migrate from the work zone and potentially endanger unprotected personnel or the community all on site activities will cease until the release is brought under control. CDG will immediately notify the proper authorities so that they may be able to ensure that public health and safety is maintained throughout this process event to the extent of evacuation if necessary.

11.3 Personnel Injury

In the event of an injury, all personnel will assemble at the designated emergency meeting location. The Site HSO, prior to the beginning of filed activities should designate this location. If the injured person is immobile one or more persons should remain nearby to provide any necessary first aid techniques. If medical help is necessary, the Site HSO will summon the appropriate assistance for transportation to the nearest medical facility. Due to the potential for these situations, CDG recommends that at least one qualified person be CPR/First Aid certified.

11.4 Evacuation Plan

Gasoline and diesel are flammable substances; therefore, a fire/explosion potential exists during the excavation activities. In the event of an onsite evacuation, the following plan will be implemented:

- A signal consisting of one continuous blast of a vehicle or air horn will be used
- All personnel will immediately evacuate the area and report to the designated emergency meeting location for further instruction

11.5 Spill Prevention and Response

In the event of a leak or spill, the area will be blocked using barricades, and the spill contained until absorbed and removed by authorized personnel. Unauthorized persons will be denied access to the area until all spills have been removed and field operations completed. CDG will follow prescribed procedures for reporting and responding to large releases by notifying the National Response Center (see Section 11.7). All materials will be disposed of according to regulatory guidelines.

11.6 Emergency Communication

In the event of an emergency situation, the following standard hand signals will be used onsite as a means of communication:

- Hand gripping throat-(cannot breathe)
- Grip partner's wrist or both hands around waist- (leave area immediately)
- Hands on top of head- (need assistance)
- Thumbs up- (OK, I am all right, I understand)
- Thumbs down- (No, negative)

11.7 Contingency Contacts

In the event of an emergency, CDG has provided several emergency contacts. These contacts, along with phone numbers, are listed in the following table. The Site HSO will be responsible for the notification of these contacts in the event of an emergency.

AGENCY	CONTACT	TELEPHONE NO.
Fire Department		911
Police Department		911
Ambulance		911
Hospital		334-293-8000
Corporate HSO	David Dailey	205-403-2600
Project Manager	Trent Carnley	334-222-9431
EPA RCRA-Superfund Hotline		800-424-9346
Chemtrec (24 hours)		800-424-9300
Bureau of Explosives (24 hours)		202-293-4048
Centers for Disease Control (Biological Agents)		404-633-5353
National Response Center		800-424-8802

Medical Facility

Name of Hospital: Jackson Hospital

Address: 1725 Pine Street, Montgomery, AL 36106

Phone: 334-293-8000

Route to Hospital: see attached map with driving directions

Travel Time from Site: 6 minutes

Distance to Hospital: 1.5 miles

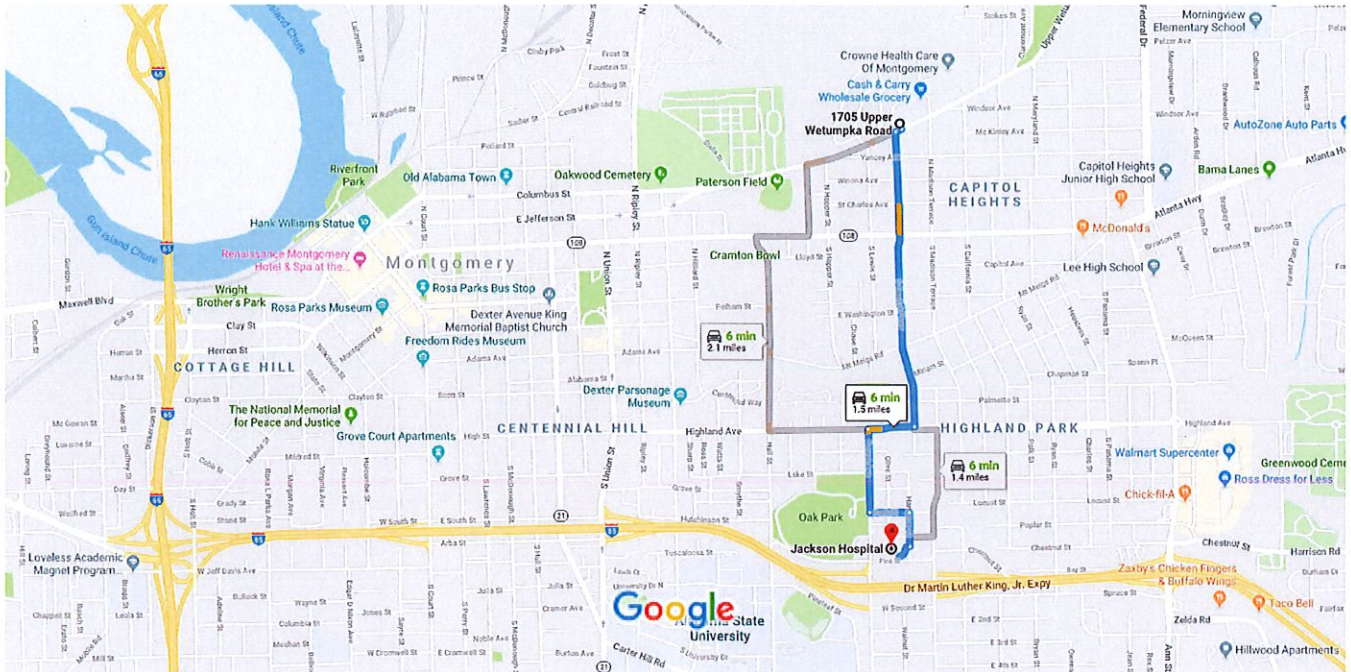
Name/Number of 24-hour Ambulance Service: 911

In cases of construction accidents, rapid notification to OSHA is required.



1705 Upper Wetumpka Road, Montgomery, AL to Jackson Hospital

Drive 1.5 miles, 6 min



Map data ©2019 Google 1000 ft

1705 Upper Wetumpka Rd

Montgomery, AL 36107

- ↑ 1. Head southwest on Upper Wetumpka Rd toward Capitol Pkwy Ct
105 ft
- ↶ 2. Turn left onto N Capitol Pkwy
0.9 mi
- ↷ 3. Turn right onto Highland Ave
0.1 mi
- ↶ 4. Turn left onto Forest Ave
0.2 mi
- ↶ 5. Turn left onto Park Pl
0.1 mi
- ↷ 6. Turn right at the 2nd cross street onto Hampton St
0.1 mi
- ↷ 7. Turn right
Destination will be on the right
259 ft

Jackson Hospital