



# FORMER COUGAR OIL NO. 40 CORRECTIVE ACTION PLAN MODIFICATION ATTF CP-70

**Former Cougar Oil No. 40  
203 East Meighan Boulevard  
Gadsden, Etowah Co., AL  
Fac ID 11262-055-010640  
UST96-11-14**



**PREPARED FOR**

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**DATE**

August 13, 2020

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**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."



Signature

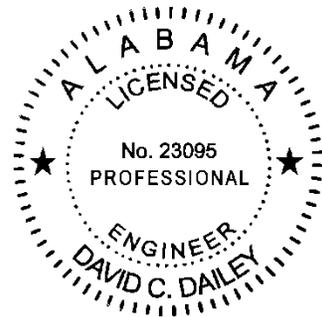
David C. Dailey

Registered Engineer in the State of Alabama

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8/14/20

Date



## **SITE LOCATION AND HISTORY**

The former Cougar Oil Store No. 40 is located at 203 East Meighan Boulevard in Gadsden, Etowah County, Alabama. The site is currently occupied by TitleMax Title Loans. CDG Engineers & Associates, Inc. (CDG) contracted with Cougar Oil Company (Cougar) in July 2015 to manage the remediation and reporting requirements for the former Cougar Oil No. 40.

To date both a Preliminary and Secondary Investigation have been completed. Additionally, an Alabama Risk-Based Corrective Action (ARBCA) evaluation and a Corrective Action Plan (CAP) have been completed for the site. In correspondence dated May 25, 2011, the Alabama Department of Environmental Management (ADEM) approved a Revised CAP consisting of continued Remediation by Natural Attenuation (RNA) and Mobile Enhanced Multi-Phase Extraction (MEME) events along with supplemental injections of surfactants performed by EcoVac. Following the change of Alabama Tank Trust Fund (ATTF) contractor, CDG discontinued the use of surfactant injections.

The site is located on a rectangular shaped parcel, the majority of which is paved with a layer of asphalt. The property is bounded to the north by East Meighan Boulevard, the east by commercial properties, to the south by both commercial and residential properties, and to the west by commercial properties. Municipal water and sanitary sewer services are provided to the site by the City of Gadsden. Municipal water lines are present in the right-of-way along U.S. Highway 278. Overhead electric and communications are also located along U.S. Highway 278. A water well inventory has been completed for the surrounding area. Results of the survey show that there are no public water wells located within one mile of the site.

In order to effectively address the on-site dissolved hydrocarbon plume, CDG proposed that a Modified Corrective Action Plan (CAP) be prepared for the site in the CA-RNA/MEME report dated July 13, 2020. The cost proposal for the Modified CAP was approved by the ADEM on July 28, 2020. The following report summarizes the Modified Corrective Action Plan. The data summary tables are included in Appendix A and site figures, representing current groundwater conditions, are included in Appendix B.

## **SUMMARY OF PREVIOUS SITE INVESTIGATIONS**

In July 2015, the ATTF responsible party, Cougar Oil Company, Inc. (Cougar) transferred all ATTF contractor responsibilities to CDG. Prior to July 2015, both a Preliminary and a Secondary

Investigation were conducted at the site as well as an ARBCA evaluation and a CAP development and implementation. The original CAP proposed the use of RNA/MEME with supplemental surfactant injections. Following the change of contractor in July 2015, CDG discontinued the surfactant injections.

There are currently seventeen Type II monitoring wells at the site, including two 4-inch diameter recovery wells (RW-1 and RW-2). Both RW-1 and RW-2 are currently used for extraction during MEME events.

## **SUMMARY OF PREVIOUSLY CONDUCTED CORRECTIVE ACTION**

CDG has conducted twenty MEME events at the site, each of which has been performed at the by Brown Remediation (Brown). Over the course of the twenty events approximately 114 pounds of carbon, and 380 pounds of hydrocarbon (61 equivalent gallons) have been recovered from the site. Additionally, 11,046 gallons of petroleum contact water (PCW) has been recovered and disposed of.

## **REMEDIAL OBJECTIVES AND EXPOSURE ASSESSMENT**

### **General Remedial Objectives**

The general objectives of the corrective action activities 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 adsorbed phase petroleum hydrocarbons from soils within the vadose and saturated zone, primarily in the source area, to below approved SSTLs.
- Reduce dissolved petroleum hydrocarbons from groundwater to below approved SSTLs.
- Accomplish these objectives within the proposed period of operation.

### **Exposure Assessment**

An exposure assessment was conducted previously by TTL, Inc. during the ARBCA Tier I/II Evaluation. According to the ARBCA Tier I/II evaluation dated August 30, 1999 all potential routes of exposure from the receptor to the Chemicals of Concern (COC) were evaluated for current and reasonable future scenarios. The following receptor survey information has been drawn from the ARBCA Tier II Evaluation report:

Receptor Type	Actual Receptor	On-site/ Off-site	Pathway Status
Commercial Sites	Commercial 10 hr/day	On-Site	Current: Complete for indoor and outdoor inhalation of sub-surface soil, and shallow groundwater Future: Complete for outdoor inhalation of vapors from groundwater
	Commercial 10 hr/day	Off-Site	Current: Complete for outdoor inhalation of vapors from groundwater Future: Complete for outdoor inhalation of vapor from shallow groundwater
Construction Sites	Construction Workers	On-Site	Current: Not evaluated Future: All pathways complete.
	Construction Workers	Off-Site	Not Evaluated
Residences	Resident Adult 24 hr/day	On-Site	Current: Not Complete Future: Not Complete
	Resident Child 24 hr/day	On-Site	Current: Not Complete Future: Not Complete
	Resident Adult 24 hr/day	Off-site	Current: Not Complete Future: Not Complete
	Resident Child 24 hr/day	Off-site	Current: Not Complete Future: Not Complete

The current land use site conceptual exposure model indicates that complete exposure pathways exist on-site and off-site for indoor and outdoor vapor inhalation from subsurface soil and shallow groundwater for both commercial workers and construction workers. 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. There are no known domestic water supply wells located within 1,000 feet of the site.

### **Specific Remedial Objectives**

As part of the ARBCA Tier II Evaluation process, Site Specific Target Levels (SSTLs) were calculated for the various media (soil and groundwater) at the site based upon the site exposure assessment. An ARBCA Tier I/II was submitted in August 1999 by TTL. A summary of the approved Tier II SSTLs is presented in Appendix C.

### **RECENT MONITORING ACTIVITIES, RESULTS, AND COMPARISONS TO SSTLS**

CDG proposes a Modified CAP that would address both soil and groundwater contamination at the site. As part of the Modified CAP development, current representative concentrations for the COCs are needed in the evaluation and design of a plan to effectively treat and reduce contaminants. The site has had multiple approved groundwater monitoring events and MEME events conducted. The most recent groundwater monitoring event was completed on May 12, 2020. The following details the activities and results of the May 12, 2020 groundwater monitoring event.

#### **Groundwater Monitoring Activities**

Personnel from CDG mobilized to the site on May 12, 2020 to collect groundwater samples for Chemicals of Concern (COC), which include BTEX, methyl-tertiary-butyl-ether (MTBE), and naphthalene analysis. Upon arriving at the site, personnel removed the well caps from each of the monitoring wells and the water levels in the wells were allowed to stabilize. Potentiometric levels were then measured with an electronic oil/water interface probe and recorded on a field data sheet. Based on the results from the May 12, 2020 groundwater monitoring event, the groundwater flow direction beneath the site is generally toward the southeast. After all measurements were completed, each of the monitoring wells sampled were properly purged in preparation for groundwater sampling activities. Approximately 76.5 gallons of PCW was removed from the wells and treated using a portable carbon unit prior to being released on-site. A sample of the treated water was collected for BTEX/MTBE/Naphthalene analysis to verify that the carbon did not have breakthrough.

Groundwater samples were collected from fourteen monitoring wells for BTEX/MTBE/Naphthalene analyses using new, disposable bailers and transferred to 40 mL glass VOA vials preserved with HCl. The samples were placed on ice and transported under chain of custody to Waypoint Analytical in Memphis, Tennessee where they were analyzed by EPA Method 8260B for the presence of BTEX/MTBE/Naphthalene constituents.

### Laboratory Analytical Results

The BTEX/MTBE/Naphthalene analyses for this event indicate that COC concentrations were present at the site at levels above the Groundwater Resource Protection (GRP) Site Specific Target Levels (SSTLs) in nine of the seventeen sampled monitoring wells (MW-13, MW-16, MW-17, IW-1, IW-2, IW-3, IW-6, RW-1, and RW-2). All COC concentrations were reported to be below the established SSTLs for Indoor Air Inhalation. The concentrations above the approved SSTLs are as follows:

	<u>Chemical of Concern</u>	<u>GRP SSTLs</u>	<u>Indoor Inhalation SSTLs</u>	<u>Concentration</u>
MW-13	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.258 mg/L</b>
MW-16	Benzene	<b>0.0324 mg/L</b>	456 mg/L	<b>0.045 mg/L</b>
MW-17	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.039 mg/L</b>
IW-1	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.066 mg/L</b>
IW-2	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.742 mg/L</b>
IW-3	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.041 mg/L</b>
IW-6	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.312 mg/L</b>
	Naphthalene	<b>0.13 mg/L</b>	29,800 mg/L	<b>0.611 mg/L</b>
RW-1	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>1.37 mg/L</b>
	Naphthalene	<b>0.13 mg/L</b>	29,800 mg/L	<b>0.316 mg/L</b>
RW-2	Benzene	<b>0.0324 mg/L</b>	7.19 mg/L	<b>0.762 mg/L</b>
	Naphthalene	<b>0.13 mg/L</b>	29,800 mg/L	<b>1.25 mg/L</b>

### Conclusions – Groundwater Contamination and Site Conditions

Based on the exposure assessment that complete exposure pathways exist for on-site and off-site commercial and construction workers, current soil and groundwater concentrations were compared to the approved SSTLs determined in the ARBCA Evaluation.

Groundwater samples collected in May 2020 indicate that a petroleum hydrocarbon plume is located in the vicinity of the former tank hold. Based upon the May 2020 sampling event, the benzene concentrations in wells MW-13, MW-16, MW-17, IW-1, IW-2, IW-3, IW-6, RW-1 and RW-2 have each exceeded their respective GRP SSTLs. Additionally, concentrations of

naphthalene have exceeded their respective GRP SSTLs in IW-6, RW-1, and RW-2. All COC concentrations were below the ARBCA Tier II SSTLs for Indoor Air Inhalation.

Free product has not been historically observed at the site. No measurable accumulations of free product were observed during this event.

## **REMEDATION RATIONALE AND APPROACH**

Based upon current constituent concentrations and the risk assessment results, there are exceedances in the groundwater resource protection SSTLs for COC.

In order to accelerate the reduction of dissolved hydrocarbon concentrations, CDG recommends that Remediation by Natural Attenuation (RNA) and MEME activities be enhanced with the introduction of mobile air sparging (AS) technology. Because the COC concentrations observed do not warrant aggressive remediation of the groundwater or soil, RNA in conjunction with monthly MEME/AS events would be an effective means of achieving the site-specific cleanup goals.

Natural attenuation is the process by which dilution, volatilization, biodegradation, adsorption, and chemical reactivity are allowed to reduce contaminant concentrations to acceptable levels. As a general rule, decreasing trends indicate these natural attenuation processes are occurring and will likely continue to reduce the contaminant concentrations to below acceptable levels, when used in conjunction with MEME/AS events. If COC concentrations increase based on future monitoring results, the CAP approach should be re-evaluated.

## **REMEDATION RECOMMENDATION PLAN**

To address the existing levels of groundwater contamination at the site, the following approach is recommended:

A total of six air sparge points will be installed at the site. Each of the sparge points will be constructed with 1-inch diameter Schedule 40 PVC risers extending from just below the ground surface to approximately two feet above the bottom of the boring. Approximately two feet of screen (0.010-inch slotted) will be connected to the bottom of the solid riser. The risers and screen will be connected using threaded, flush-joint connections. The locations of the proposed sparge points are illustrated on the Proposed Well Location Map in Appendix B.

The total depth of the proposed air sparge points is approximately 25 feet below land surface (ft-bls). Well-graded sand will be placed in the boring annulus for each well from the bottom of the boring to at least two feet above the top of the screen. A bentonite seal approximately two feet thick will be placed at the top of each sand pack. A cement/bentonite grout will be placed above the bentonite seal to within approximately one foot bls. The purpose of the bentonite seal and grout is to reduce the potential for air to escape up the boring and to the ground surface.

The sparge points will be set within 8-inch diameter steel manway covers surrounded by concrete pads. Construction details are shown in Appendix B. Following the installation of the proposed wells, the corrective action approach involves allowing natural attenuation in combination with monthly 12-hour MEME/AS events to reduce contaminant concentrations to acceptable levels for site closure.

In order to receive authorization to inject atmospheric air in to the subsurface, a UIC permit is required by ADEM. CDG has submitted a UIC Permit Application under CP-70 for the injection of air, ozone, and/or oxygen.

Tri-annual groundwater monitoring events will be conducted for up to two years to monitor the natural attenuation progress toward the remediation goals. Monitoring wells will be sampled for BTEX, MTBE, and naphthalene and for natural attenuation parameters (DO, pH, and ORP). Following three tri-annual groundwater monitoring events, CDG will recommend the site for No Further Action (NFA) status if remediation goals have been met. Should target levels continue to exceed the SSTLs in the source area after one year of monitoring and the contaminant plume maintains a stable or decreasing trend, groundwater monitoring should be continued. If COC concentrations increase based on future monitoring results, the CAP approach should be re-evaluated.

## **PROPOSED REPORTING REQUIREMENTS**

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

***Reporting of Natural Attenuation Effectiveness*** - CDG proposes to submit tri-annual NAMR reports, which will summarize field activities and the progress of site groundwater constituent

concentrations towards achieving approved corrective action levels. The following data will be included in each report: field activities performed, groundwater elevations, groundwater analytical results as compared to target levels, MEME/AS event results, potentiometric surface maps, and BTEX and MTBE constituent concentration maps. The reports will also include remediation effectiveness and recommendations concerning additional measures deemed necessary.

**Request for Closure Evaluation of Corrective Action** - This report will include data that shows that remediation goals have been achieved and request a status of NFA. Methods for abandonment of wells will be described.

**Site Closure Report** - This report will describe in detail the closure of the site and removal of all monitoring, recovery, injection, and air sparge wells.

**SCHEDULE OF IMPLEMENTATION**

It is anticipated that the proposed Modified CAP will begin with the first groundwater monitoring and MEME/AS event following the approval of the Modified CAP and installation of air sparge wells. The following schedule indicates the timetable for major project events to be completed as part of this corrective action plan:

Time Following CAP Approval (months)	Project Event	Project Event Length
0 – 24	Tri-annual groundwater monitoring and monthly MEME/AS events, evaluation of performance, and recommendations for further corrective action if Required.	2 Years
25	Well abandonment; completion and submittal of final report if allowable by ADEM.	2 Months

**PROPOSED GROUNDWATER MONITORING and MEME/AS ACTIVITIES**

Following the approval of the Modified CAP, monthly 12-hour duration MEME/AS events will be conducted at the site in order to reduce dissolved hydrocarbon concentrations in the vicinity of the plume. During the events, atmospheric air will be injected into each of the proposed sparge

points, while groundwater and soil vapor is extracted from the proposed recovery wells. The MEME/AS events will be conducted using a mobile liquid ring MPE system equipped with a mobile AS system operated by Brown Remediation, Inc. The MEME system has been approved by 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 event, static water levels in selected site wells will be recorded. Applied vacuum in the extraction well and casing vacuums in the observation wells will be recorded periodically during testing (except when the unit is not attended). Water level and vacuum measurements, to determine the radius of influence, will be obtained periodically from observation wells. Measurements of flow and hydrocarbon concentrations will also be obtained periodically during the test. Field measurements will be obtained using a calibrated Flame Ionization Detector (FID) instrument. Hydrocarbon removal rates will be calculated and plotted.

Air will be injected into a suite of AS points simultaneously. The AS points will be equipped with wellhead pressure gauges, flowmeters, and control valves. An air supply system consisting of an air filter, air compressor, and pressure vessel. The air compressor should be capable of providing at least 20 cfm at pressures up to 10 to 15 pounds per square inch (gauge) (psig) above the calculated hydrostatic pressure.

Once per triannual period, groundwater samples will be collected from all wells. The groundwater samples will be collected from the wells using new clean plastic bailers and transferred to 40 milliliter (mL) glass volatile organic analysis (VOA) vials preserved with hydrochloric acid (HCl) for BTEX, MTBE, and naphthalene analysis in accordance with EPA Method 8260B. During each groundwater sampling event, all wells will also be sampled for natural attenuation parameters (DO, pH, and ORP).

The results of the proposed activities will be submitted to ADEM in the form of triannual RNA/AS/MEME reports. The report will include conclusions regarding the effectiveness of the recovery activities performed and recommendations for future site activities.



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## APPENDICES

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# TABLES

**APPENDIX A**

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-1</b>		
INSTALLATION DATE:	03/30/96	WELL DEPTH (FT BTOC):	18.5	SCREEN LENGTH (FT):	11	CASING ELEV (FT ABOVE MSL):	529.93	WELL TYPE: DIAMETER (IN):	II 2

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

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
10/15/08	12.40	517.53	-	-
04/03/09	8.40	521.53	-	-
08/03/09	11.05	518.88	-	-
01/21/10	9.44	520.49	-	-
05/25/10	9.65	520.28	-	-
09/29/10	12.62	517.31	-	-
05/02/11	8.78	521.15	-	-
08/30/11	11.20	518.73	-	-
01/24/12	9.94	519.99	-	-
05/30/12	11.48	518.45	-	-
10/23/12	12.21	517.72	-	-
02/13/13	9.00	520.93	-	-
10/15/13	11.07	518.86	-	-
02/17/14	9.20	520.73	-	-
05/27/14	9.90	520.03	-	-
11/13/14	12.85	517.08	-	-
03/30/15	9.45	520.48	-	-
07/16/15	10.85	519.08	-	-
02/23/16	9.50	520.43	-	1.0
06/20/16	11.40	518.53	-	1.0
02/07/17	12.50	517.43	-	0.5
06/07/17	9.25	520.68	-	3.0
10/31/17	11.16	518.77	-	3.0
02/22/18	9.78	520.15	-	3.5
06/19/18	11.39	518.54	-	2.5
10/04/18	12.23	517.70	-	2.5
02/19/19	8.64	521.29	-	3.0
05/09/19	9.57	520.36	-	3.0
08/20/19	12.25	517.68	-	2.5
02/06/20	7.85	522.08	-	4.5
05/12/20	9.16	520.77	-	4.0

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
10/15/08	1.59	6.17	142.0
04/03/09	1.59	6.15	190.0
08/03/09	1.39	5.10	213.0
01/21/10	3.09	7.51	407.0
05/25/10	1.59	6.81	307.0
09/29/10	0.84	5.94	-30.0
05/02/11	2.16	5.42	162.0
08/30/11	1.32	5.03	151.0
01/24/12	3.16	6.30	-70.0
05/30/12	1.00	6.66	-96.0
10/23/12	1.21	6.34	-35.0
02/13/13	1.64	5.95	12.0
10/15/13	9.99	6.25	101.0
02/17/14	-	-	-
05/27/14	1.80	5.69	99.0
11/13/14	2.16	5.91	-47.0
03/30/15	4.81	5.29	108.0
07/16/15	2.12	4.78	194.0
02/23/16	1.80	6.85	-
06/20/16	1.85	6.77	27.6
02/07/17	1.91	7.18	-76.6
06/07/17	2.03	7.25	-119.5
10/31/17	2.72	6.58	-70.3
02/22/18	1.82	7.06	-7.8
06/19/18	-	-	-
10/04/18	2.99	7.89	-48.0
02/19/19	1.79	6.98	-10.2
05/09/19	1.98	7.79	33.8
08/20/19	1.36	6.21	39.5
02/06/20	5.97	6.68	67.8
05/12/20	0.84	6.15	-48.6

## Monitoring Point Data Summary Table

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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
08/03/09	0.1800	0.0397	0.8358	0.0926	<0.008	0.9681	-
01/21/10	0.0103	0.0308	0.2371	0.0814	<0.0008	0.3493	-
05/25/10	0.0089	0.0183	0.2777	0.0804	<0.0008	0.3764	-
09/29/10	<b>2.5200</b>	<b>2.8180</b>	2.9850	4.2400	0.0228	10.0658	-
05/02/11	0.0058	0.0108	0.1975	0.1030	<0.0008	0.3113	-
05/03/11	CA VIA MEME						
08/30/11	0.1650	0.1716	0.6229	0.6748	<0.0040	1.4693	-
01/24/12	0.0416	0.1376	0.5101	0.9582	0.0052	1.6111	-
05/30/12	0.0846	0.1815	0.3728	0.7904	0.0130	1.3577	-
10/23/12	0.3036	<b>0.7585</b>	1.1140	2.4690	<0.0080	4.3415	-
02/13/13	0.1182	0.1666	0.4740	0.9138	0.0189	1.5733	-
10/15/13	0.1020	0.1160	0.6915	0.4170	<0.040	1.2245	-
02/17/14	NOT SAMPLED						
05/27/14	0.0032	0.0013	0.0911	0.0596	<0.0008	0.1520	-
11/13/14	0.2362	<0.0050	0.1955	0.1342	<0.0080	0.3297	-
03/30/15	0.0052	0.0011	0.0452	0.0200	<0.0008	0.0663	-
07/16/15	0.0037	0.0009	0.0160	0.0067	<0.0008	0.0236	-
02/23/16	<0.00100	<0.00100	<0.00500	<0.00100	<0.00100	BDL	-
06/20/16	<0.00100	<0.00100	0.0015	0.0011	0.0022	0.0048	0.0014
02/07/17	<0.004	0.0074	0.0191	0.3504	0.1999	0.5768	0.0311
06/07/17	<0.0010	<0.0010	<0.0010	0.0051	<0.0010	0.0051	0.0011
10/31/17	<0.0010	<0.0010	<0.0010	0.0017	<0.0010	0.0017	<0.0010
02/22/18	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
06/19/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/04/18	<0.0010	0.0012	<0.0010	0.0225	0.0114	0.0351	<0.0010
02/19/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
05/09/19	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	0.0012	<0.0010
08/20/19	<0.001	<0.001	<0.001	<0.001	<0.003	BDL	<0.005
02/06/20	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
05/12/20	<0.001	<0.001	<0.002	<0.001	<0.001	BDL	<0.005
GRP SSTLs:	<b>1.25</b>	<b>0.312</b>	<b>62.4</b>	<b>43.7</b>	<b>198</b>	-	<b>1.25</b>
Inhalation SSTLs:	<b>29800</b>	<b>7.19</b>	<b>535</b>	<b>150</b>	<b>198</b>	-	<b>29800</b>

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-2</b>		
INSTALLATION DATE:	03/30/96	WELL DEPTH (FT BTOC):	17.0	SCREEN LENGTH (FT):	11	CASING ELEV (FT ABOVE MSL):	529.63	WELL TYPE: DIAMETER (IN):	II 2
Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)									

### POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
10/15/08	11.62	518.01	-	-
04/03/09	7.66	521.97	-	-
08/03/09	10.45	519.18	-	-
01/21/10	8.87	520.76	-	-
05/25/10	9.06	520.57	-	-
09/29/10	12.02	517.61	-	-
05/02/11	8.20	521.43	-	-
08/30/11	10.61	519.02	-	-
01/24/12	9.00	520.63	-	-
05/30/12	10.90	518.73	-	-
12/23/12	11.61	518.02	-	-
02/13/13	8.41	521.22	-	-
10/15/13	10.46	519.17	-	-
02/17/14	8.57	521.06	-	-
05/27/14	9.35	520.28	-	-
11/13/14	12.23	517.40	-	-
03/30/15	8.90	520.73	-	-
07/16/15	10.27	519.36	-	-
02/23/16	9.20	520.43	-	1.0
06/20/16	10.80	518.83	-	1.0
02/07/17	12.10	517.53	-	0.5
06/07/17	8.70	520.93	-	2.5
10/31/17	11.42	518.21	-	2.5
02/22/18	9.23	520.40	-	3.5
06/19/18	10.72	518.91	-	2.0
10/04/18	11.59	518.04	-	2.0
02/19/19	8.39	521.24	-	3.0
05/09/19	8.96	520.67	-	3.0
08/20/19	11.65	517.98	-	2.0
02/06/20	6.73	522.90	-	4.0
05/12/20	8.64	520.99	-	3.5

### INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
10/15/08	2.24	6.23	137.0
04/03/09	3.22	5.38	359.0
08/03/09	2.10	4.95	217.0
01/21/10	6.80	6.14	216.0
05/25/10	2.04	5.53	309.0
09/29/10	0.93	6.07	-62.0
05/02/11	0.92	5.79	35.0
08/30/11	0.81	5.77	-12.0
01/24/12	2.86	6.07	63.0
05/30/12	0.94	5.90	-7.0
10/23/12	0.69	6.00	37.0
02/13/13	5.80	6.16	11.0
10/15/13	1.41	6.22	-56.0
02/17/14	-	-	-
05/27/14	-	-	-
11/13/14	-	-	-
03/30/15	-	-	-
07/16/15	1.69	5.24	21.0
02/23/16	1.48	6.65	NA
06/20/16	1.44	6.67	-28.2
02/07/17	1.50	7.17	-68.6
06/07/17	1.43	6.93	-99.4
10/31/17	1.41	6.37	-84.9
02/22/18	1.93	6.85	6.2
06/19/18	-	-	-
10/04/18	1.61	8.25	-65.4
02/19/19	2.01	6.72	9.3
05/09/19	2.40	8.27	-105.2
08/20/19	0.88	6.38	-41.7
02/06/20	8.84	5.47	-0.3
05/12/20	0.34	6.19	-13.6

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-2</b>		
INSTALLATION DATE:	03/30/96	WELL DEPTH (FT BTOC):	17.0	SCREEN LENGTH (FT):	11	CASING ELEV (FT ABOVE MSL):	529.63	WELL TYPE: DIAMETER (IN):	II 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
08/03/09	<0.004	0.0262	0.6850	0.6483	<0.004	1.3595	-
01/21/10	0.0022	0.0048	0.1878	0.1404	0.0016	0.3346	-
05/25/10	<0.0016	0.0199	0.8496	0.9714	0.0023	1.8432	-
09/29/10	<0.0016	0.0073	0.4708	0.5569	<0.0016	1.0350	-
05/02/11	<0.0008	0.0011	0.1426	0.1005	<0.0008	0.2442	-
05/03/11	CA VIA MEME						
08/30/11	<0.0005	0.0059	0.2728	0.4398	<0.0008	0.7185	-
01/24/12	<0.0005	0.0004	0.0574	0.0482	<0.0008	0.1060	-
05/30/12	<0.0005	0.0010	0.1100	0.1122	<0.0008	0.2232	-
12/23/12	<0.0025	<0.0020	0.1658	0.2213	<0.0040	0.3871	-
02/13/13	<0.0005	<0.0005	0.0066	0.0036	<0.0008	0.0102	-
10/15/13	<0.0005	<0.0005	0.0610	0.0994	<0.0008	0.1604	-
02/17/14	NOT SAMPLED						
05/27/14	NOT SAMPLED						
11/13/14	NOT SAMPLED						
03/30/15	NOT SAMPLED						
07/16/15	<0.0005	<0.0005	0.0622	0.0655	<0.0008	0.1277	-
02/23/16	<0.00100	<0.00100	<0.00500	<0.00100	<0.00100	BDL	-
06/20/16	<0.00100	<0.00100	<0.00100	<0.00100	0.0016	0.0016	0.0010
02/07/17	<0.001	<0.001	<0.001	0.0523	0.0309	0.0832	0.0111
06/07/17	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	0.0019	<0.0010
10/31/17	<0.0010	<0.0010	<0.0010	0.0048	0.0018	0.0066	0.0018
02/22/18	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
06/19/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/04/18	<0.0010	<0.0010	<0.0010	0.0029	<0.0010	0.0029	<0.0010
02/19/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
05/09/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010
08/20/19	<0.001	<0.001	<0.001	0.001	<0.003	0.001	<0.005
02/06/20	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
05/12/20	<0.001	<0.001	<0.002	<0.001	<0.001	BDL	<0.005
GRP SSTLs:	<b>0.119</b>	<b>0.0297</b>	<b>5.93</b>	<b>4.15</b>	<b>59.3</b>	-	<b>0.119</b>
Inhalation SSTLs:	<b>29800</b>	<b>7.19</b>	<b>535</b>	<b>150</b>	<b>198</b>	-	<b>29800</b>

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-13</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.5	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	530.54	WELL TYPE: DIAMETER (IN):	II 2
Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)									

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
10/15/08	12.46	518.08	-	-
04/03/09	8.70	521.84	-	-
08/03/09	11.15	519.39	-	-
01/21/10	9.60	520.94	-	-
05/25/10	9.75	520.79	-	-
09/29/10	12.16	518.38	-	-
05/02/11	6.92	523.62	-	-
08/30/11	11.25	519.29	-	-
01/24/12	9.90	520.64	-	-
05/30/12	11.55	518.99	-	-
10/23/12	12.32	518.22	-	-
02/13/13	9.24	521.30	-	-
10/15/13	11.16	519.38	-	-
02/17/14	9.33	521.21	-	-
05/27/14	10.00	520.54	-	-
11/13/14	12.91	517.63	-	-
03/30/15	9.61	520.93	-	-
07/16/15	10.93	519.61	-	-
02/23/16	9.30	521.24	-	1.0
06/20/16	11.50	519.04	-	1.0
02/07/17	12.70	517.84	-	1.0
06/07/17	9.40	521.14	-	3.0
10/31/17	11.25	519.29	-	5.0
02/22/18	9.96	520.58	-	3.0
06/19/18	11.38	519.16	-	2.5
10/04/18	12.27	518.27	-	2.5
02/19/19	9.57	520.97	-	3.0
05/09/19	9.58	520.96	-	3.0
08/20/19	12.31	518.23	-	2.0
02/06/20	9.18	521.36	-	4.0
05/12/20	9.29	521.25	-	4.0

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
10/15/08	1.27	5.68	239.0
04/03/09	0.67	6.34	131.0
08/03/09	1.85	5.06	183.0
01/21/10	4.61	6.54	153.0
05/25/10	1.68	6.47	211.0
09/29/10	0.97	5.85	-38.0
05/02/11	1.17	6.03	-56.0
08/30/11	0.94	6.03	-78.0
01/24/12	2.82	6.55	-104.0
05/30/12	1.23	6.32	-77.0
10/23/12	1.27	6.24	-4.0
02/13/13	1.27	6.31	-74.0
10/15/13	0.91	5.74	-21.0
02/17/14	1.62	5.71	25.0
05/27/14	2.06	5.69	45.0
11/13/14	0.79	6.05	-66.0
03/30/15	1.63	5.83	31.0
07/16/15	1.28	5.23	-16.0
02/23/16	1.08	6.73	-
06/20/16	1.37	6.84	-102.2
02/07/17	1.79	6.95	-72.7
06/07/17	2.96	2.88	-83.1
10/31/17	2.92	6.94	-71.0
02/22/18	2.07	7.01	-82.3
06/19/18	-	-	-
10/04/18	0.82	8.11	-102.7
02/19/19	1.99	7.11	-93.8
05/09/19	1.66	7.57	-57.9
08/20/19	0.64	5.84	2.6
02/06/20	2.15	6.75	-66.8
05/12/20	0.40	5.84	-14.3

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-13</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.5	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	530.54	WELL TYPE: DIAMETER (IN):	II 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
08/03/09	<b>3.5880</b>	<b>7.8580</b>	2.8490	<b>10.6690</b>	<0.008	21.3760	-
01/21/10	<b>4.3300</b>	<b>4.7520</b>	3.189	<b>10.3410</b>	0.1520	15.2450	-
05/25/10	<b>4.0170</b>	<b>4.1120</b>	3.4790	<b>10.0420</b>	0.1420	17.7750	-
09/29/10	<b>6.6390</b>	<b>7.0520</b>	2.8700	<b>8.4460</b>	0.1840	18.5520	-
05/02/11	<b>3.7320</b>	<b>1.8690</b>	2.2980	<b>4.6120</b>	0.3275	9.1065	-
<b>05/03/11</b>	<b>CA VIA MEME</b>						
08/30/11	<b>5.3960</b>	<b>4.4200</b>	3.0510	<b>8.6000</b>	0.1190	16.1900	-
01/24/12	<b>2.4140</b>	<b>1.5660</b>	1.0650	2.7060	0.1980	5.5350	-
05/30/12	<b>3.0780</b>	<b>11.4600</b>	2.4820	<b>10.1350</b>	0.0960	24.1730	-
10/23/12	<b>3.4600</b>	<b>3.6610</b>	1.4290	4.2630	0.1620	9.5150	-
02/13/13	<b>1.5820</b>	<b>1.8910</b>	0.6730	2.039	0.1830	2.7470	-
10/15/13	<b>2.0500</b>	<b>5.0260</b>	1.5980	<b>6.1010</b>	0.1210	12.8460	-
02/17/14	<b>1.5000</b>	<b>3.3400</b>	1.6260	<b>6.0340</b>	0.0840	11.0840	-
05/27/14	<b>1.5800</b>	<b>3.9600</b>	2.1800	<b>8.2100</b>	0.0460	14.3960	-
11/13/14	<b>1.8740</b>	<b>0.3055</b>	1.6960	1.8350	<0.40	3.8365	-
03/30/15	<b>2.1170</b>	<b>1.4990</b>	1.1680	2.350	0.0465	2.7135	-
07/16/15	<b>0.8665</b>	<b>0.4350</b>	0.8805	1.6620	0.0530	3.0305	-
02/23/16	0.0024	<b>0.6710</b>	1.1400	0.5720	1.4300	3.8130	-
06/20/16	<0.01	<b>1.3417</b>	2.4047	1.8409	4.0633	9.6506	<b>0.6417</b>
02/07/17	0.0306	<b>1.4404</b>	6.4251	1.8412	4.9748	14.6815	<b>0.4252</b>
06/07/17	<0.0050	<b>0.1893</b>	0.0515	0.5703	0.3585	1.1696	<b>0.1897</b>
10/31/17	<0.0050	<b>0.3382</b>	0.4557	0.6396	1.0061	2.4396	<b>0.1755</b>
02/22/18	<0.010	<b>0.191</b>	0.341	0.507	1.11	2.1490	<b>0.176</b>
06/19/18	<0.0050	<b>0.1613</b>	<0.0050	0.2188	0.0351	0.4152	0.0215
10/04/18	0.0011	<b>0.3057</b>	0.0051	0.2329	0.0144	0.5581	0.0106
02/19/19	<0.0010	<b>0.1265</b>	0.0013	0.0435	0.0233	0.1946	0.0069
05/09/19	<0.0010	<b>0.2263</b>	0.0032	0.0865	0.0098	0.3257	0.0696
08/20/19	<0.001	<b>0.213</b>	0.005	0.076	0.007	0.301	0.032
02/06/20	<0.010	<b>0.720</b>	0.464	1.41	4.76	7.35	<b>0.343</b>
05/12/20	<0.010	<b>0.258</b>	<0.020	0.054	0.086	0.398	<0.050
GRP SSTLs:	<b>0.13</b>	<b>0.0324</b>	<b>6.48</b>	<b>4.53</b>	<b>64.8</b>	-	<b>0.13</b>
Inhalation SSTLs:	<b>29800</b>	<b>7.19</b>	<b>535</b>	<b>150</b>	<b>198</b>	-	<b>29800</b>

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-14</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.0	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	531.42	WELL TYPE: DIAMETER (IN):	II 2
Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)									

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
10/15/08	13.40	518.02	-	-
04/03/09	9.57	521.85	-	-
08/03/09	12.02	519.40	-	-
01/21/10	10.50	520.92	-	-
05/25/10	10.65	520.77	-	-
09/29/10	13.61	517.81	-	-
05/02/11	9.81	521.61	-	-
08/30/11	12.20	519.22	-	-
01/24/12	10.73	520.69	-	-
05/30/12	12.45	518.97	-	-
10/23/12	13.21	518.21	-	-
02/13/13	10.10	521.32	-	-
10/15/13	12.12	519.30	-	-
02/17/14	10.20	521.22	-	-
05/27/14	10.87	520.55	-	-
11/13/14	13.81	517.61	-	-
03/30/15	10.50	520.92	-	-
07/16/15	11.85	519.57	-	-
02/23/16	9.30	522.12	-	1.0
06/20/16	12.40	519.02	-	1.0
02/07/17	13.60	517.82	-	0.5
06/07/17	10.40	521.02	-	3.0
10/31/17	11.25	520.17	-	5.0
02/22/18	10.82	520.60	-	3.0
06/19/18	12.27	519.15	-	2.5
10/04/18	10.19	521.23	-	3.0
02/19/19	9.72	521.70	-	3.5
05/09/19	10.44	520.98	-	2.5
08/20/19	31.21	500.21	-	2.0
02/06/20	9.75	521.67	-	3.5
05/12/20	10.16	521.26	-	3.5

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
10/15/08	5.18	4.93	525.0
04/03/09	1.07	5.46	356.0
08/03/09	3.97	4.34	254.0
01/21/10	-	-	-
05/25/10	-	-	-
09/29/10	4.16	4.09	376.0
05/02/11	-	-	-
08/30/11	4.42	4.43	279.0
01/24/12	3.89	5.21	248.0
05/30/12	5.29	4.43	293.0
10/23/12	5.42	4.38	256.0
02/13/13	2.33	6.78	235.0
10/15/13	-	-	-
02/17/14	2.50	5.35	223.0
05/27/14	2.18	4.56	226.0
11/13/14	11.38	4.72	262.0
03/30/15	5.77	3.99	249.0
07/16/15	7.58	4.60	324.0
02/23/16	2.19	6.07	NA
06/20/16	2.00	7.29	30.3
02/07/17	2.68	7.01	14.4
06/07/17	1.61	8.16	-82.6
10/31/17	2.92	6.94	-71.0
02/22/18	2.13	6.67	122.8
06/19/18	-	-	-
10/04/18	2.45	8.24	60.9
02/19/19	1.87	6.89	119.3
05/09/19	1.73	7.32	106.8
08/20/19	4.42	4.87	173.6
02/06/20	6.44	6.15	172.8
05/12/20	4.87	4.85	-174.9

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-14</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.0	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	531.42	WELL TYPE: DIAMETER (IN):	II 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
08/03/09	<0.0008	<0.0006	<0.0003	<0.0014	<0.0008	BDL	-
01/21/10	NOT SAMPLED						
05/25/10	NOT SAMPLED						
09/29/10	<0.0008	<0.0006	0.0003	<0.0014	<0.0008	0.0003	-
05/02/11	NOT SAMPLED						
05/03/11	CA VIA MEME						
08/30/11	<0.0005	<0.0004	<0.0004	<0.0013	<0.0008	BDL	-
01/24/12	NOT SAMPLED						
05/30/12	NOT SAMPLED						
10/23/12	NOT SAMPLED						
02/13/13	0.0016	<0.0005	<0.0004	<0.0013	0.0036	0.0036	-
10/15/13	<b>1.5360</b>	<b>0.3880</b>	0.3680	1.3320	0.1530	2.2410	-
02/17/14	<b>1.3430</b>	<b>0.7100</b>	0.7260	1.8200	<0.080	3.2560	-
05/27/14	<b>1.1060</b>	<b>0.1620</b>	0.7460	1.0800	0.1380	2.1260	-
11/13/14	NOT SAMPLED						
03/30/15	NOT SAMPLED						
07/16/15	<b>1.1880</b>	<b>0.5425</b>	1.1690	2.910	0.0710	1.7825	-
02/23/16	<0.00100	<0.00100	<0.00500	<0.00100	<0.00100	BDL	-
06/20/16	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	BDL	<0.001
02/07/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
06/07/17	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/31/17	<0.0050	0.3382	0.4557	0.6396	1.0061	2.4396	<b>0.1755</b>
02/22/18	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
06/19/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/04/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
02/19/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
05/09/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
08/20/19	<0.001	<0.001	<0.001	<0.001	<0.003	BDL	<0.005
02/06/20	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
05/12/20	<0.001	<0.001	<0.002	<0.001	<0.001	BDL	<0.005
GRP SSTLs:	<b>0.13</b>	<b>0.0324</b>	<b>6.48</b>	<b>4.53</b>	<b>64.8</b>	-	<b>0.13</b>
Inhalation SSTLs:	<b>29800</b>	<b>7.19</b>	<b>535</b>	<b>150</b>	<b>198</b>	-	<b>29800</b>

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-15</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.0	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	531.37	WELL TYPE: DIAMETER (IN):	II 2
Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)									

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
10/15/08	13.35	518.02	-	-
04/03/09	9.45	521.92	-	-
08/03/09	10.90	520.47	-	-
01/21/10	10.44	520.93	-	-
05/25/10	10.61	520.76	-	-
09/29/10	14.56	516.81	-	-
05/02/11	9.74	521.63	-	-
08/30/11	12.15	519.22	-	-
01/24/12	10.69	520.68	-	-
05/30/12	12.44	518.93	-	-
10/23/12	13.17	518.20	-	-
02/13/13	10.03	521.34	-	-
10/15/13	12.05	519.32	-	-
02/17/14	10.13	521.24	-	-
05/27/14	10.86	520.51	-	-
11/13/14	13.80	517.57	-	-
03/30/15	10.43	520.94	-	-
07/16/15	11.80	519.57	-	-
02/23/16	9.70	521.67	-	1.0
06/20/16	12.40	518.97	-	1.0
02/07/17	13.40	517.97	-	0.5
06/07/17	10.30	521.07	-	2.5
10/31/17	12.08	519.29	-	2.5
02/22/18	10.72	520.65	-	3.0
06/19/18	12.24	519.13	-	1.5
10/04/18	13.16	518.21	-	2.0
02/19/19	9.91	521.46	-	3.0
05/09/19	10.31	521.06	-	2.5
08/20/19	13.23	518.14	-	2.5
02/06/20	9.55	521.82	-	3.5
05/12/20	10.11	521.26	-	3.5

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
10/15/08	5.22	5.16	501.0
04/03/09	5.81	5.41	372.0
08/03/09	5.91	4.57	319.0
01/21/10	-	-	-
05/25/10	-	-	-
09/29/10	2.60	5.21	275.0
05/02/11	-	-	-
08/30/11	5.03	5.63	198.0
01/24/12	5.72	5.86	206.0
05/30/12	5.85	5.64	250.0
10/23/12	5.53	4.84	233.0
02/13/13	7.94	5.91	177.0
10/15/13	-	-	-
02/17/14	3.50	6.00	205.0
05/27/14	3.78	5.33	213.0
11/13/14	11.47	6.56	200.0
03/30/15	6.95	4.65	169.0
07/16/15	7.55	6.31	240.0
02/23/16	2.66	6.52	
06/20/16	2.08	6.64	56.7
02/07/17	3.44	7.10	5.1
06/07/17	2.02	8.36	-96.9
10/31/17	3.01	6.44	15.1
02/22/18	2.26	6.61	102.8
06/19/18	-	-	-
10/04/18	2.95	8.20	65.2
02/19/19	1.98	6.72	103.3
05/09/19	1.90	7.51	81.3
08/20/19	4.83	5.78	97.6
02/06/20	5.64	6.24	158.3
05/12/20	4.94	5.57	96.7

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-15</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.0	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	531.37	WELL TYPE: DIAMETER (IN):	II 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
08/03/09	<0.0008	<0.0006	<0.0006	<0.0014	<0.0008J	BDL	-
01/21/10	NOT SAMPLED						
05/25/10	NOT SAMPLED						
09/29/10	0.0038	<0.0006	<0.0003	<0.0014	0.0061	0.0061	-
05/02/11	NOT SAMPLED						
05/03/11	CA VIA MEME						
08/30/11	0.0447	0.0004	<0.0004	<0.0013	0.0012	0.0016	-
01/24/12	NOT SAMPLED						
05/30/12	NOT SAMPLED						
10/23/12	NOT SAMPLED						
02/13/13	0.0006	<0.0005	<0.0004	<0.0013	<0.0008	BDL	-
10/15/13	NOT SAMPLED						
02/17/14	<0.0005	<0.0005	<0.0004	0.0013	<0.0008	0.0013	-
05/27/14	NOT SAMPLED						
11/13/14	NOT SAMPLED						
03/30/15	NOT SAMPLED						
07/16/15	<0.0005	<0.0005	<0.0004	<0.0013	<0.0008	BDL	-
02/23/16	<0.00100	<0.00100	<0.00500	<0.00100	<0.00100	BDL	-
06/20/16	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	BDL	<0.001
02/07/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
06/07/17	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/31/17	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
02/22/18	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
06/19/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/04/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
02/19/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
05/09/19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
08/20/19	<0.001	<0.001	<0.001	<0.001	<0.003	BDL	<0.005
02/06/20	<0.001	<0.001	<0.005	<0.001	<0.001	BDL	<0.005
05/12/20	<0.001	<0.001	<0.002	<0.001	<0.001	BDL	<0.005
GRP SSTLs:	<b>0.13</b>	<b>0.0324</b>	<b>6.48</b>	<b>4.53</b>	<b>64.8</b>	-	<b>0.13</b>
Inhalation SSTLs:	<b>29800</b>	<b>7.19</b>	<b>535</b>	<b>150</b>	<b>198</b>	-	<b>29800</b>

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-16</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.0	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	530.30	WELL TYPE: DIAMETER (IN):	II 2
Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)									

### POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
10/15/08	12.21	518.09	-	-
04/03/09	8.45	521.85	-	-
08/03/09	11.98	518.32	-	-
01/21/10	9.34	520.96	-	-
05/25/10	9.54	520.76	-	-
09/29/10	12.40	517.90	-	-
05/02/11	8.69	521.61	-	-
08/30/11	11.00	519.30	-	-
01/24/12	9.95	520.35	-	-
05/30/12	11.28	519.02	-	-
10/23/12	12.05	518.25	-	-
02/13/13	9.00	521.30	-	-
10/15/13	10.92	519.38	-	-
02/17/14	9.10	521.20	-	-
05/27/14	9.80	520.50	-	-
11/13/14	12.65	517.65	-	-
03/30/15	9.40	520.90	-	-
07/16/15	10.70	519.60	-	-
02/23/16	8.90	521.40	-	1.0
06/20/16	11.30	519.00	-	1.0
02/07/17	12.90	517.40	-	0.5
06/07/17	9.30	521.00	-	3.0
10/31/17	11.01	519.29	-	3.0
02/22/18	9.76	520.54	-	3.5
06/19/18	11.14	519.16	-	2.0
10/04/18	12.04	518.26	-	2.0
02/19/19	8.89	521.41	-	3.5
05/09/19	9.31	520.99	-	3.0
08/20/19	12.03	518.27	-	2.0
02/06/20	8.37	521.93	-	4.0
05/12/20	9.06	521.24	-	4.0

### INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
10/15/08	1.34	6.21	137.0
04/03/09	0.95	6.12	173.0
08/03/09	1.22	5.64	146.0
01/21/10	3.77	6.23	133.0
05/25/10	1.27	6.15	209.0
09/29/10	0.67	6.18	-81.0
05/02/11	0.93	6.29	-102.0
08/30/11	0.90	6.04	-80.0
01/24/12	2.88	6.32	-63.0
05/30/12	0.81	5.70	105.0
10/23/12	0.66	5.94	51.0
02/13/13	1.13	6.00	-50.0
10/15/13	-	-	-
02/17/14	1.25	5.94	-5.0
05/27/14	-	-	-
11/13/14	-	-	-
03/30/15	-	-	-
07/16/15	1.59	4.61	162.0
02/23/16	1.31	6.54	-
06/20/16	2.99	6.40	4.4
02/07/17	1.57	7.36	-101.5
06/07/17	1.93	7.10	-87.9
10/31/17	1.79	6.68	-10.9
02/22/18	2.30	6.96	-58.7
06/19/18	-	-	-
10/04/18	1.15	7.95	-9.4
02/19/19	2.07	7.03	-68.9
05/09/19	1.93	7.91	-20.2
08/20/19	0.61	5.73	36.9
02/06/20	3.23	6.26	-4.2
05/12/20	0.55	5.48	91.1

## Monitoring Point Data Summary Table

SITE NAME:	Former Cougar Oil No. 40			UST NUMBER:	96-11-14	WELL ID:	<b>MW-16</b>		
INSTALLATION DATE:	04/16/08	WELL DEPTH (FT BTOC):	18.0	SCREEN LENGTH (FT):	9	CASING ELEV (FT ABOVE MSL):	530.30	WELL TYPE: DIAMETER (IN):	II 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
08/03/09	<b>0.4557</b>	<b>0.0641</b>	1.0050	0.8811	0.0322	1.9824	-
01/21/10	<b>0.6329</b>	<b>0.0499</b>	1.0880	0.7704	0.0484	1.9567	-
05/25/10	<b>0.8959</b>	<b>0.1244</b>	1.4910	1.6760	0.0545	3.3459	-
09/29/10	<b>0.2694</b>	<b>0.0553</b>	0.8042	1.2360	0.0247	2.1202	-
05/02/11	<b>0.2393</b>	0.0248	0.8027	0.4073	0.0172	1.2520	-
<b>05/03/11</b>	<b>CA VIA MEME</b>						
08/30/11	<b>0.1880</b>	<b>0.0391</b>	0.6676	0.5800	0.0261	1.3128	-
01/24/12	0.0025	0.0014	0.0764	0.0858	<0.0008	0.1636	-
05/30/12	0.0046	0.0009	0.1946	0.1030	<0.0008	0.2985	-
10/23/12	0.0065	<0.0020	0.1142	0.0961	0.0069	0.2172	-
02/13/13	0.0022	<0.0005	0.0449	0.0344	<0.0008	0.0793	-
10/15/13	NOT SAMPLED						
02/17/14	0.0116	0.0040	0.1425	0.1432	<0.0008	0.2897	-
05/27/14	NOT SAMPLED						
11/13/14	NOT SAMPLED						
03/30/15	NOT SAMPLED						
07/16/15	0.0029	<0.0005	0.0113	0.0009	<0.0008	0.0122	-
02/23/16	<0.00100	0.0015	<0.00500	0.0018	0.0031	0.0064	-
06/20/16	<0.00100	0.0191	<0.00100	<0.00100	0.0015	0.0206	0.0090
02/07/17	<0.01	<b>0.1215</b>	0.1621	0.9210	1.9008	3.1054	0.4649
06/07/17	<0.0010	0.0024	<0.0010	0.0331	0.0098	0.0453	0.0083
10/31/17	<0.0010	<0.0010	<0.0010	0.0032	<0.0010	0.0032	0.0026
02/22/18	<0.001	<0.001	<0.005	0.001	<0.001	0.0010	<0.005
06/19/18	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	BDL	<0.0010
10/04/18	<0.0010	<0.0010	<0.0010	0.0028	0.0068	0.0096	0.0073
02/19/19	<0.0010	0.0104	<0.0010	0.0054	<0.0010	0.0158	<0.0010
05/09/19	<0.0010	<b>0.1162</b>	0.0058	0.0297	0.0319	0.1835	0.0176
08/20/19	<0.001	<b>0.076</b>	0.001	0.003	0.023	0.103	0.024
02/06/20	<0.001	<0.001	<0.005	0.003	<0.001	0.003	<0.005
05/12/20	<0.001	<b>0.045</b>	<0.002	<0.001	<0.001	0.045	<0.005
GRP SSTLs:	<b>0.13</b>	<b>0.0324</b>	<b>6.48</b>	<b>4.53</b>	<b>64.8</b>	-	<b>0.13</b>
Inhalation SSTLs:	<b>48000</b>	<b>456</b>	<b>535</b>	<b>152</b>	<b>198</b>	-	<b>48000</b>













































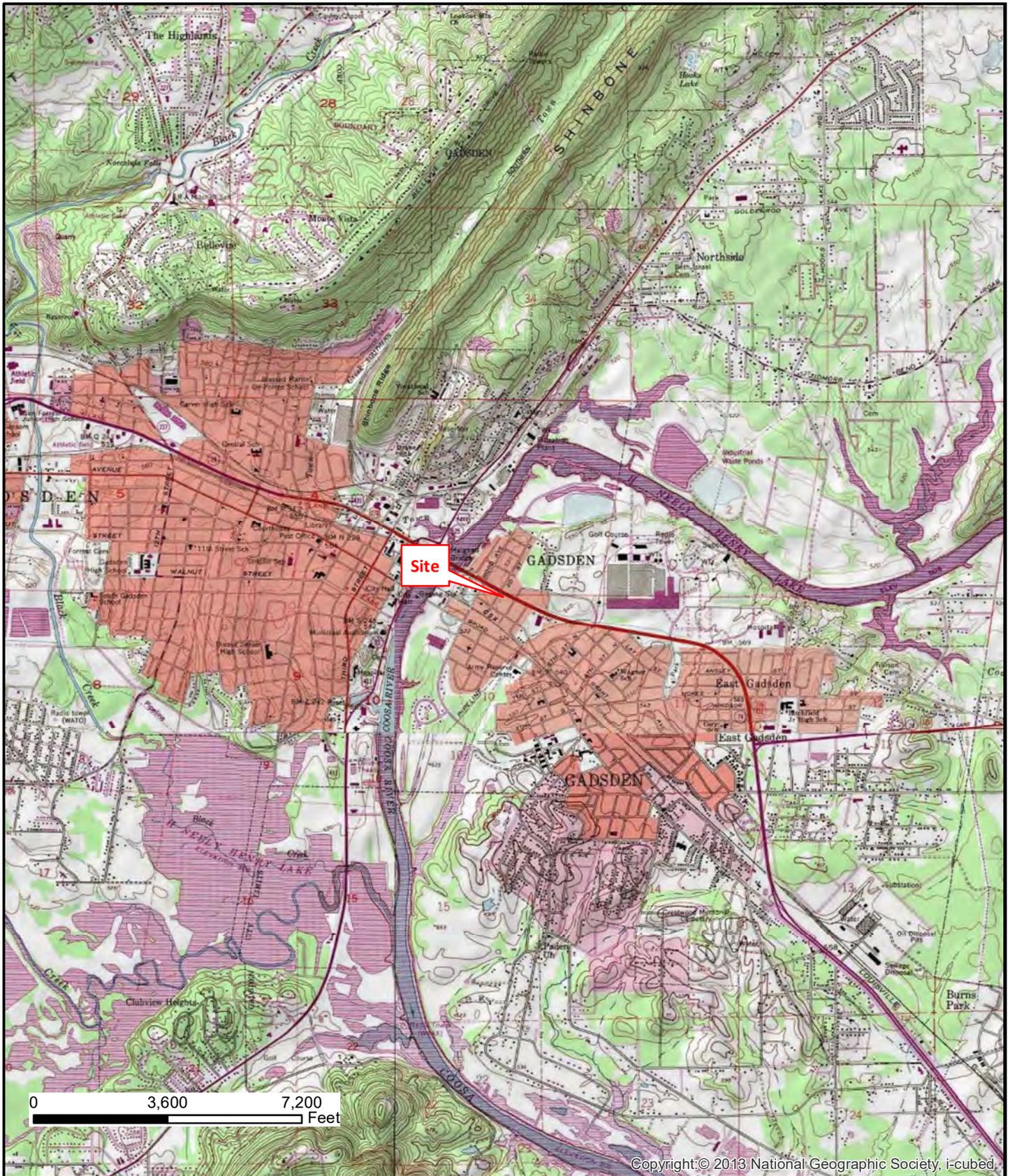




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# FIGURES

**APPENDIX B**





LEGEND

C Commercial  
R Residential

Land Use Map  
August 2020

Former Cougar Oil No. 40  
203 East Meighan Blvd.  
Gadsden, Etowah County, Alabama

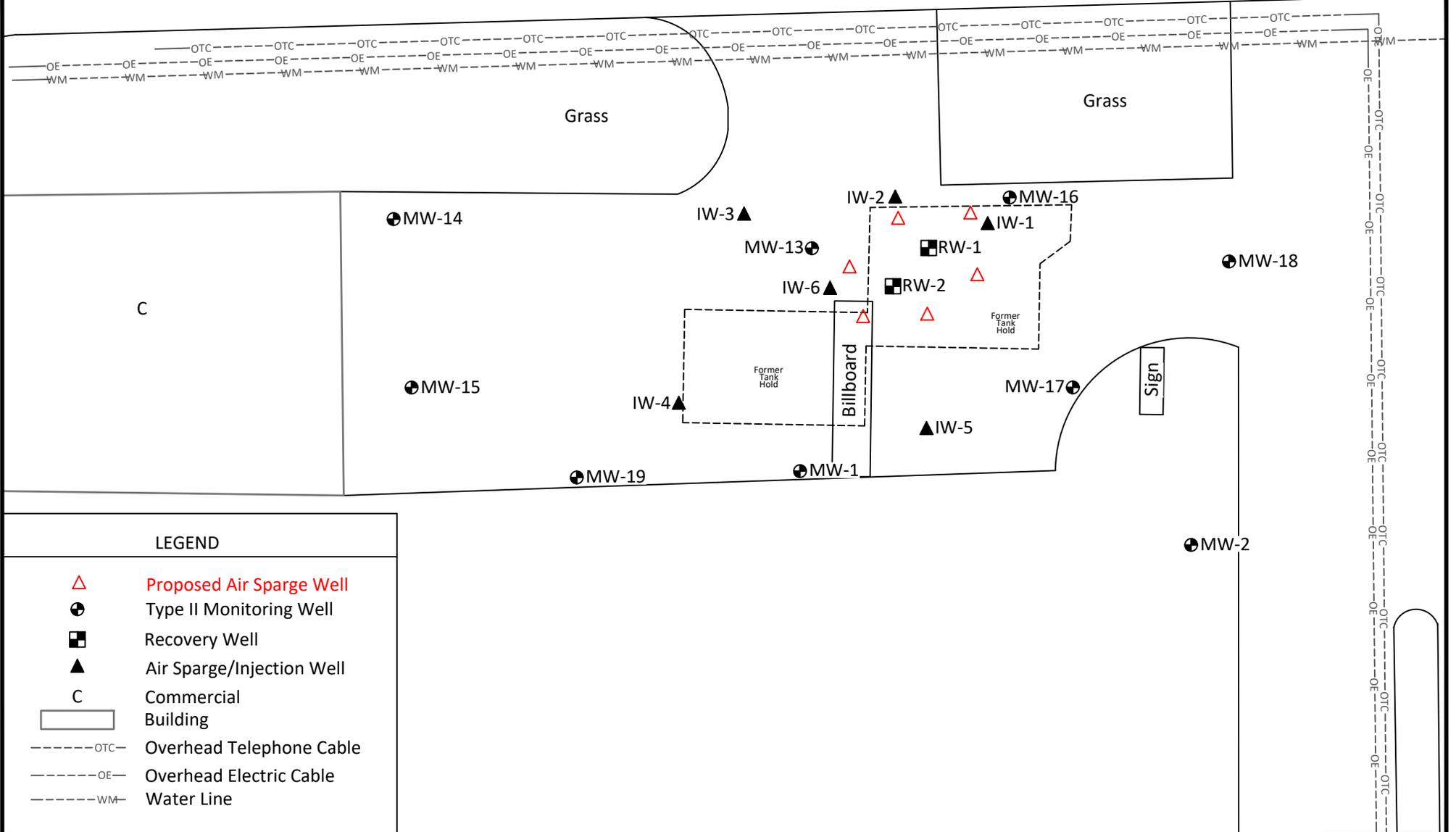


Approximate Scale in Feet



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E Meighan Blvd



LEGEND

-  Proposed Air Sparge Well
-  Type II Monitoring Well
-  Recovery Well
-  Air Sparge/Injection Well
-  Commercial Building
-  Building
-  Overhead Telephone Cable
-  Overhead Electric Cable
-  Water Line

Site Map with Utility and Proposed Air Sparge Well Locations



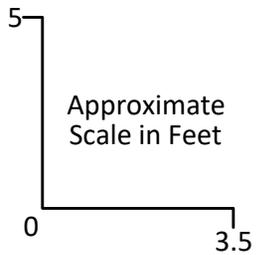
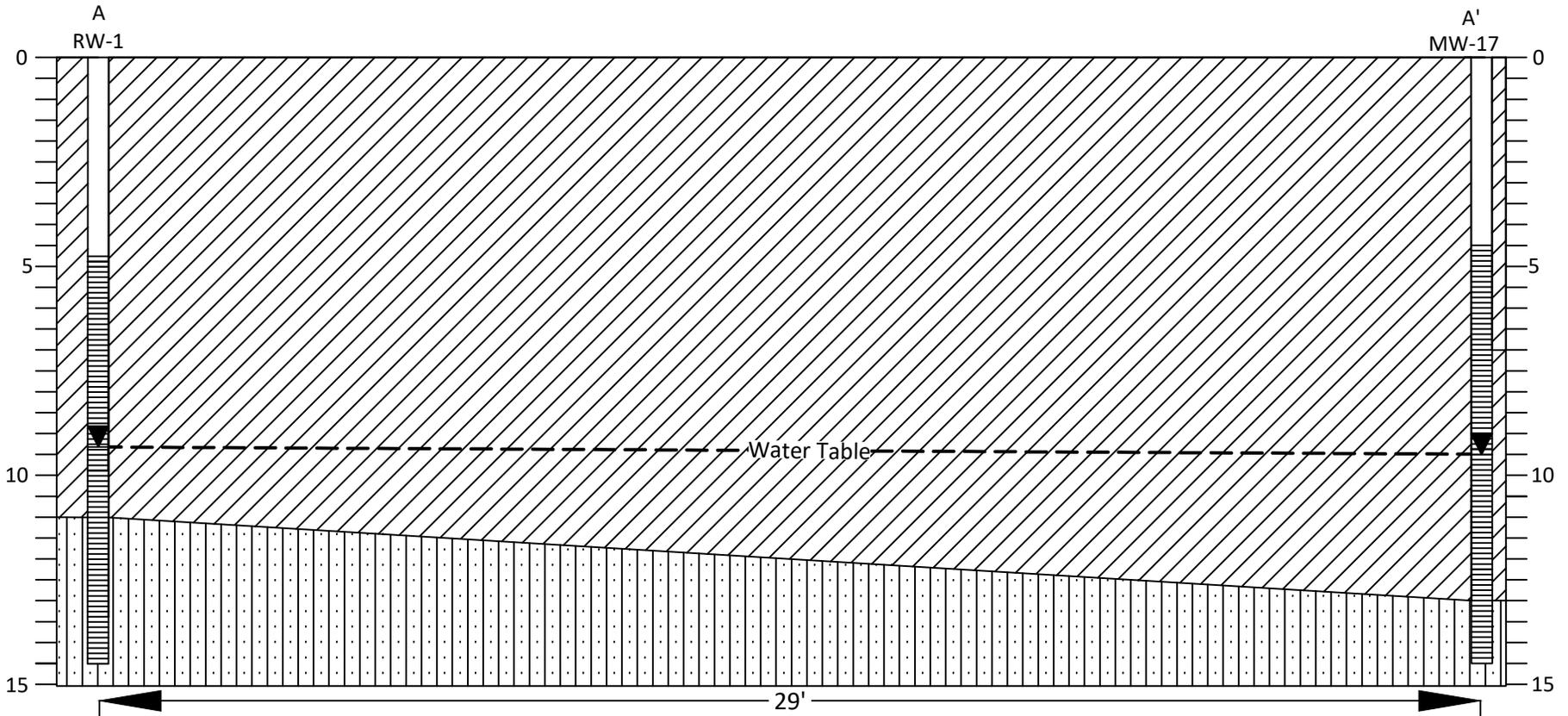
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Former Cougar Oil No. 40  
203 East Meighan Blvd.  
Gadsden, Etowah County, Alabama



Approximate Scale in Feet



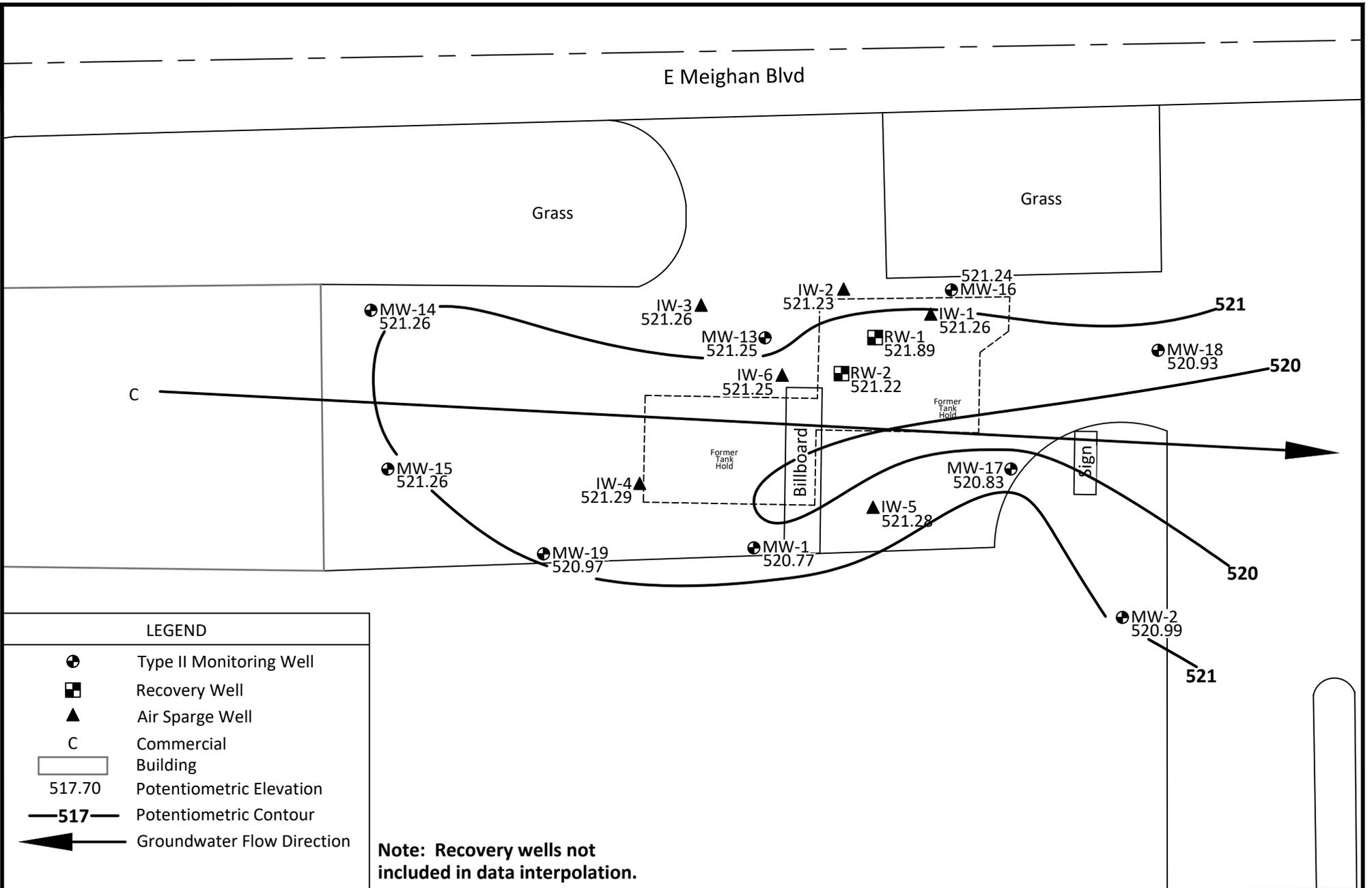


Lithologic Cross-Section A-A'

Former Cougar Oil No. 40  
203 East Meighan Blvd.  
Gadsden, Etowah County, Alabama

Legend

-  Silty Clay
-  Silty Sand
-  Screened Interval
-  Groundwater Level



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Potentiometric Surface Map  
May 12, 2020

Former Cougar Oil No. 40  
203 East Meighan Blvd.  
Gadsden, Etowah County, Alabama



Approximate Scale in Feet



E Meighan Blvd

Grass

Grass

C

● MW-14  
<0.001/BDL  
<0.001/<0.005

● MW-15  
<0.001/BDL  
<0.001/<0.005

● MW-19  
<0.001/BDL  
<0.001/<0.005

● MW-1  
<0.001/BDL  
<0.001/<0.005

▲ IW-2  
0.742/1.051  
<0.010/<0.050

▲ IW-3  
0.041/0.172  
<0.001/0.025

▲ IW-6  
0.258/0.398  
<0.010/<0.050

▲ IW-4  
0.312/3.94  
<0.010/0.611

▲ IW-5  
0.002/0.090  
<0.001/0.027

■ RW-1  
0.066/0.182  
<0.001/0.006

■ RW-2  
0.762/7.63  
<0.010/1.25

● MW-16  
0.045/0.045  
<0.001/<0.005

● MW-17  
0.039/9.07  
<0.010/0.366

● MW-18  
<0.001/BDL  
<0.001/<0.005

● MW-2  
<0.001/BDL  
<0.001/<0.005

LEGEND

● Type II Monitoring Well

■ Recovery Well

▲ Air Sparge Well

C Commercial

▭ Building

<0.001/BDL Benzene/BTEX Concentration (mg/L)

<0.001/<0.001 MTBE/Naphthalene Concentration (mg/L)

—0.01— Benzene Contour

BDL Below Detection Limit

Groundwater Analytical and Benzene Contour Map  
May 12, 2020

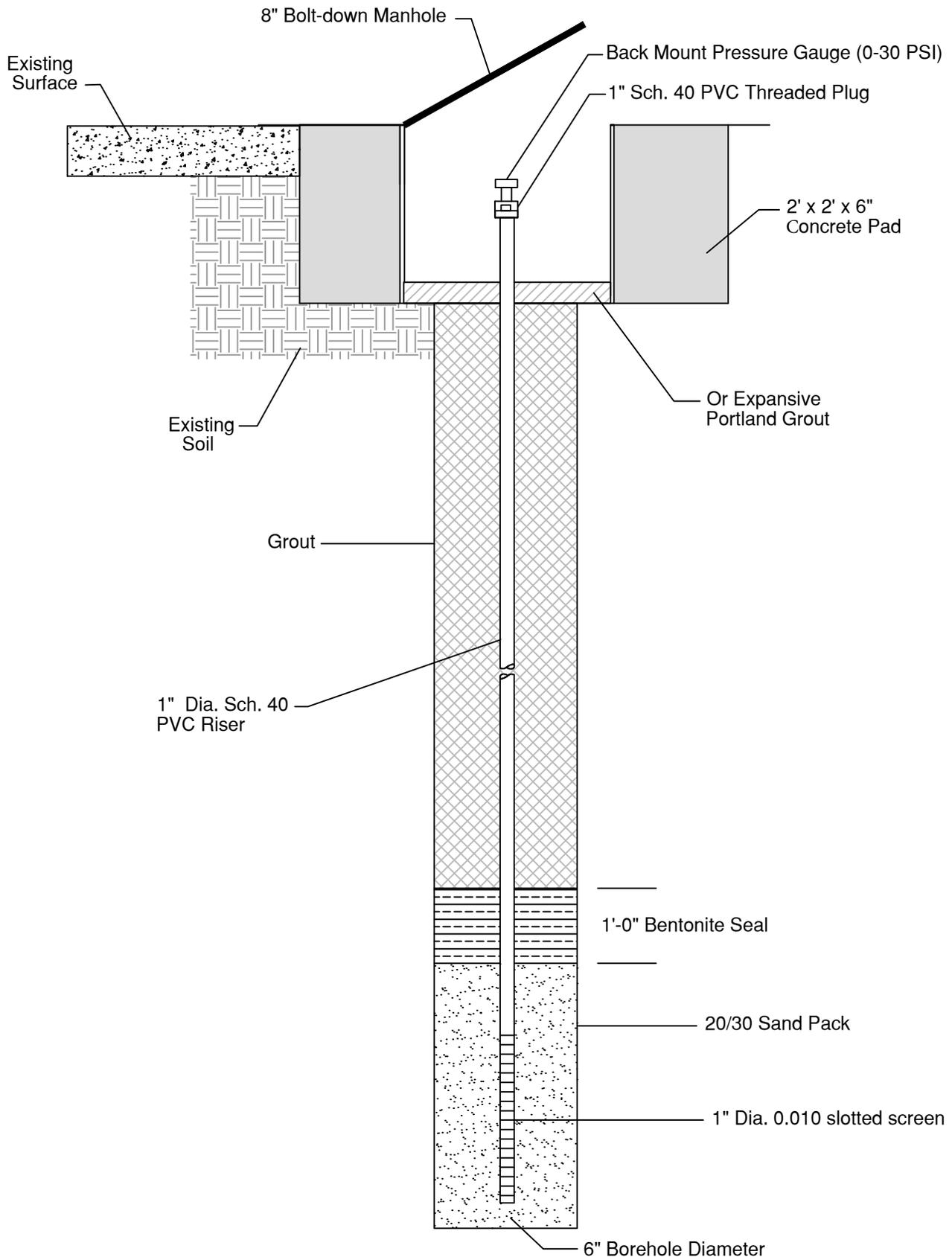
Former Cougar Oil No. 40  
203 East Meighan Blvd.  
Gadsden, Etowah County, Alabama



Approximate Scale in Feet



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Air Sparge Well Construction Detail

Cougar Oil #40  
 203 East Meighan Blvd.  
 Gadsden, Etowach County, AL

Not to Scale



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# **APPROVED ARBCA SITE SPECIFIC TARGET LEVELS**

**APPENDIX C**

**Cougar Oil #40**  
**203 East Meighan Blvd.**  
**Gadsden, Etowah County, Alabama**  
**Fac. ID# 11262-055-010640**  
**UST96-11-14**

WELL ID	APPROVED SSTL	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	NAPHTHALENE
		<i>Concentrations Reported in mg/L</i>					
MW-1	GRP	1.25	0.312	62	43.7	198	1.25
	Inhalation	29800	7.19	535	150	198	29800
MW-2	GRP	0.119	0.0297	5.93	4.15	59.3	0.119
	Inhalation	29800	7.19	535	150	198	29800
MW-13	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
MW-14	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
MW-15	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
MW-16	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
MW-17	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
MW-18	GRP	0.129	0.0323	6.47	4.53	64.7	0.129
	Inhalation	29800	7.19	535	150	198	29800
MW-19	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
IW-1	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
IW-2	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
IW-3	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
IW-4	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
IW-5	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	29800	7.19	535	150	198	29800
IW-6	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	89396	20.48	1387	297	244	89396
RW-1	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	148991	33.77	2239	445	290	148991
RW-2	GRP	0.13	0.0324	6.48	4.53	64.8	0.13
	Inhalation	208587	47.06	3091	592	336	208587



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# **SITE HEALTH AND SAFETY PLAN**

**APPENDIX D**

# **Site Health and Safety Plan**

**Cougar Oil #40  
203 East Meighan Blvd.  
Gadsden, Etowah County, Alabama  
Facility ID# 11262-055-010640  
UST96-11-14**

***Prepared For:*  
Cougar Oil Company  
1411 Water Avenue  
Selma, Alabama 36702**

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

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## 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 Cougar Oil #40 site located in Gadsden, Etowah 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.
Daniel	Project Manager / Site HSO	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 may include installation and excavation 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 hazards associated with use of any type of drill rig and heavy machinery while performing corrective action activities. Generally during these field operations, the 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 hazards 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 electrocution:

- 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 electrocution. 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:

<b>LEVELS OF PPE PROTECTION</b>	<b>PPE REQUIREMENTS</b>
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 know 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 issue 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 exists
- 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		1-256-494-4000
Corporate HSO	David Dailey	1-205-403-2600
Project Manager	Jessica Henson	1-256-403-2600
EPA RCRA-Superfund Hotline		1-800-424-9346
Chemtrec (24 hours)		1-800-424-9300
Bureau of Explosives (24 hours)		1-202-293-4048
Centers for Disease Control (Biological Agents)		1-404-633-5353
National Response Center		1-800-424-8802

### **Medical Facility**

Name of Hospital: Gadsden Regional Medical Center

Address: 1007 Goodyear Ave, Gadsden, AL 35903

Phone: 256-494-4000

Route to Hospital: see attached map with driving directions

Travel Time from Site: 4 minutes

Distance to Hospital: 1.6 miles

Name/Number of 24-hour Ambulance Service: 911

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

# YOUR TRIP TO:

1007 Goodyear Ave

**2 MIN | 1.5 MI** 

**Est. fuel cost: \$0.11**

Trip time based on traffic conditions as of 11:32 AM on August 13, 2020. Current Traffic: Moderate



Print a full health report of your car with HUM vehicle diagnostics (800) 906-2501



1. Start out going **southeast** on E Meighan Blvd/US-431 S/US-278 E/AL-74/AL-1 toward 3rd St.

Then 1.06 miles ----- 1.06 total miles



2. Turn **left** onto Goodyear Ave.  
*Goodyear Ave is 0.1 miles past Litchfield Ave.*

*If you reach Doyle St you've gone a little too far.*

Then 0.37 miles ----- 1.43 total miles



3. Turn **right** to stay on Goodyear Ave.

Then 0.03 miles ----- 1.45 total miles

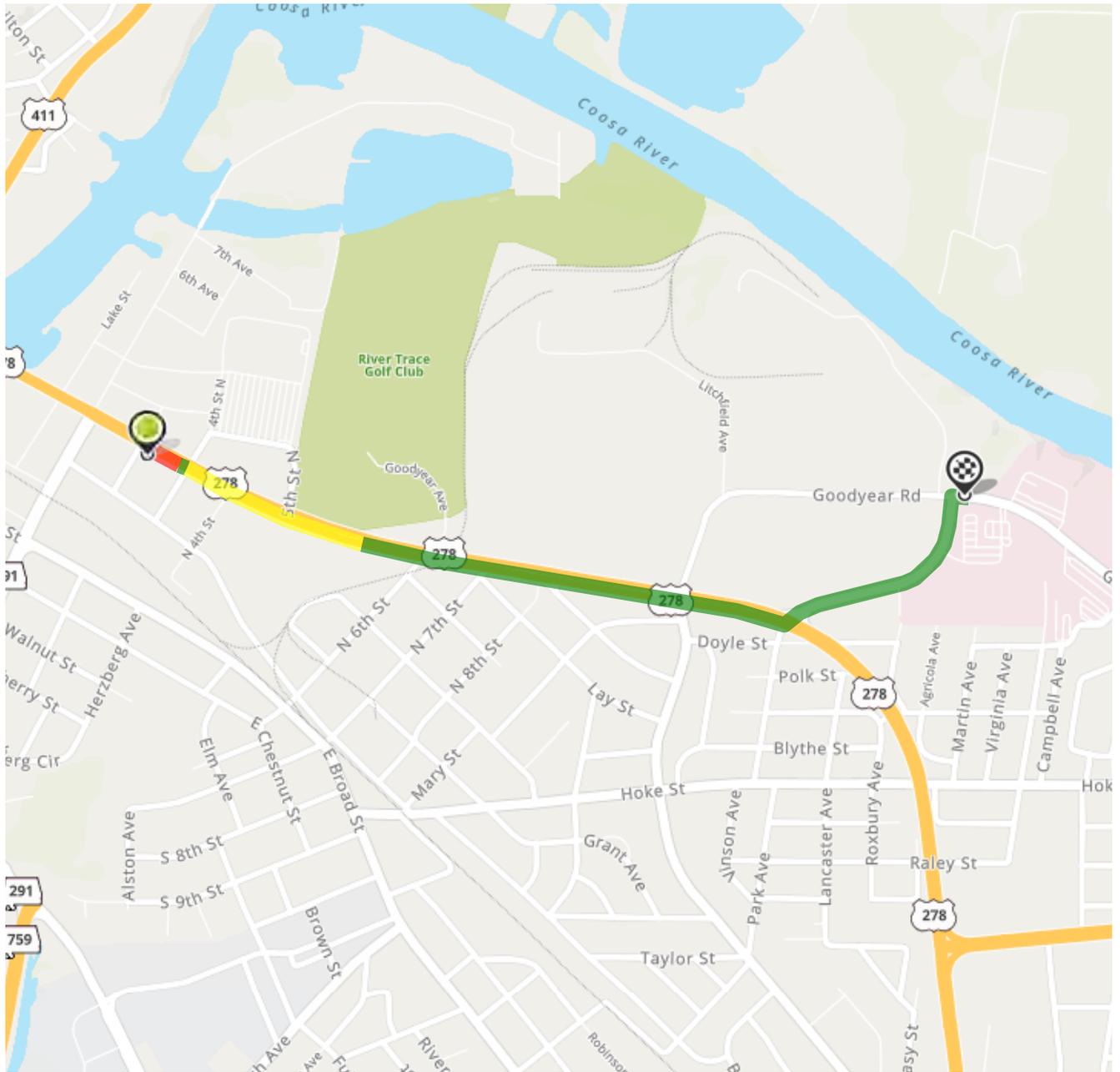


4. 1007 Goodyear Ave, Gadsden, AL 35903-1106, 1007 GOODYEAR AVE is on the **right**.

*If you reach Gaines Ave you've gone about 0.3 miles too far.*

 Save to My Maps

Use of directions and maps is subject to our [Terms of Use](#). We don't guarantee accuracy, route conditions or usability. You assume all risk of use.





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# UIC PERMIT

**APPENDIX E**

**LANCE R. LEFLEUR**  
DIRECTOR



**KAY IVEY**  
GOVERNOR

Alabama Department of Environmental Management  
[adem.alabama.gov](http://adem.alabama.gov)

1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463  
Montgomery, Alabama 36130-1463  
(334) 271-7700 ■ FAX (334) 271-7950

August 7, 2020

ROBERT SHEPARD, VICE PRESIDENT  
CDG ENGINEERS & ASSOCIATES, INC.  
P.O. BOX 278  
ANDALUSIA AL 36420

RE: Cougar Oil #40  
203 East Meighan Boulevard  
Gadsden, AL 35903  
Etowah County (055)

Dear Mr. Shepard:

Based on your request (as evidenced by the submittal of a Notice of Intent) coverage under **General UIC Permit Number ALIG010121** is granted. The effective date of coverage is August 7, 2020.

Coverage under this permit does not authorize the discharge of any pollutant or wastewater that is not specifically identified in the permit and by the Notice of Intent which resulted in the granting of coverage.

A copy of the General UIC Permit under which coverage of your discharges has been granted is enclosed. If you have any questions concerning this permit, please contact Billie Jean Wascher by email at [billiejean.wascher@adem.alabama.gov](mailto:billiejean.wascher@adem.alabama.gov) or by phone at (334) 271-7953.

Sincerely,

A handwritten signature in black ink that reads "Jeffery W. Kitchens". The signature is written in a cursive style.

Jeffery W. Kitchens  
Chief  
Water Division

Enclosure: Permit

**Birmingham Branch**  
110 Vulcan Road  
Birmingham, AL 35209-4702  
(205) 942-6168  
(205) 941-1603 (FAX)

**Decatur Branch**  
2715 Sandlin Road, S.W.  
Decatur, AL 35603-1333  
(256) 353-1713  
(256) 340-9359 (FAX)



**Mobile Branch**  
2204 Perimeter Road  
Mobile, AL 36615-1131  
(251) 450-3400  
(251) 479-2593 (FAX)

**Mobile-Coastal**  
3664 Dauphin Street, Suite B  
Mobile, AL 36608  
(251) 304-1176  
(251) 304-1189 (FAX)



# UNDERGROUND INJECTION CONTROL PERMIT

**DISCHARGE AUTHORIZED:** Discharges associated with the injection of air, oxygen gas, and/or ozone gas for the purposes of remediating soil and groundwater contamination.

**AREA OF COVERAGE:** The State of Alabama

**PERMIT NUMBER:** [ALIG010121](#)

**INJECTION WELL CLASS:** Class V

*In accordance with and subject to the provisions of the Safe Drinking Water Act, as amended, 42 U.S.C. §§ 300f-300j (the "SWDA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 to 22-22-14, (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§ 22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to construct and operate injection well(s) of the above-described class.*

**ISSUANCE DATE:** June 9, 2016

**EFFECTIVE DATE:** June 9, 2016

**EXPIRATION DATE:** June 8, 2021

Alabama Department of Environmental Management

**PART I Authorization to Operate**

- A. The permittee is authorized to operate a Class V Injection Well(s), at the facility described in the permit application and in the cover page of this permit, in accordance with the provisions set forth in this permit
- B. This permit and the authorization to inject shall remain in effect until the expiration date stated on the cover page of this permit. If the permittee desires to continue injection past the expiration date of this permit, the permittee shall request a permit reissuance at least 180 days prior to expiration of this permit.
- C. The permittee shall inject only air, oxygen gas, and/or ozone gas for the purpose of remediating existing contamination present in the subsurface.
- D. The permittee shall not inject any substance that is defined as hazardous or toxic by Federal or State laws or regulations or any substance not identified in the application for this permit. The use of fluids or substances other than those identified in this permit is prohibited.

**PART II Records, Reports, & Submittals**

- A. The permittee shall retain all records concerning the data used to complete the permit application, the operation of the wells, and the nature and composition of fluid injected; to include records of the calibration of instruments, meters and gauges, quality control records, and recordings from continuous monitoring instrumentation; until at least three years after the closure of well(s).
- B. When requested by ADEM, the permittee shall deliver copies of any of the records maintained in accordance with this permit.
- C. The permittee shall report to ADEM any of the following:
  - 1. Any planned action which will change the use of the injection wells, will result in injection of a fluid different from that authorized by this permit, will change the method of operations of any injection well, or will change the method of the monitoring of well operations or injected fluids.
  - 2. Any planned transfer of ownership of all or part of the permitted operation.
  - 3. Any relevant facts of which the permittee becomes aware which should have been submitted in a permit application and any corrections to data previously submitted in a permit application.
- D. Studies, engineering reports, plans and specifications, plugging and abandonment plans, logging reports, and other technical documents submitted to comply with this permit shall be prepared by or under the supervision of qualified persons defined by Rule 6-8-.13 of the UIC Regulations of ADEM.

**PART III Plugging and Abandonment**

- A. The permittee shall perform any abandonment and closure actions which may be required to remove a threat to groundwater quality or to the health of persons which is caused by the injection activity.
- B. Upon the end of use for each injection well, the permittee shall plug and abandon each well in a manner which protects each USDW from pollution by surface water and which prevents the movement of any pollutant or formation fluid from one USDW to another or from one formation to another and which isolates the injection zone

**PART IV      General Provisions**

- A. The permittee shall comply with all provisions of the UIC Regulations of ADEM and shall comply with all provisions of this permit and shall reduce or halt injection if needed to maintain compliance with the permit and regulations.
- B. The permittee shall comply with all applicable Federal and State hazardous waste management regulations.
- C. The permittee shall allow members of ADEM staff to:
  - 1. Access property and records of the permittee for purposes of inspection.
  - 2. Collect samples of the injected fluids associated with the permitted injection wells.
  - 3. Collect samples from any monitoring wells.
  - 4. Obtain copies of records upon request.
- D. The permittee shall immediately take all reasonable steps to minimize or correct any adverse environmental impact resulting from the operation of the permitted injection wells.
- E. This permit does not convey any property rights of any sort, or any exclusive privilege.
- F. The filing of a request by the permittee for a permit modification, revocation, and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
- G. Any noncompliance with this permit constitutes a violation of the Alabama Water Pollution Control Act and/or the Underground Injection Control Regulations and is grounds for enforcement action such as permit termination, revocation, modification; or denial of a permit renewal application.
- H. Injection into waters of the state, which in this case is groundwater, in accordance with this permit shall not result in the exceedance of any primary or secondary Maximum Contaminant Level (MCL) in groundwater as established by the Environmental Protection Agency. Injection into groundwater, in accordance with this permit shall not result in a violation of a surface water quality standard.
- I. All provisions of ADEM Admin. Code Rule 335-6-8-.12 are incorporated as terms and conditions of this permit by reference.
- J. The permittee authorized to discharge under this General Permit, who wishes to continue to discharge upon the expiration of this permit, shall submit an E-NOI Notice of Intent to be covered by the reissued General Permit. Such Notice of Intent shall include information required

by the initial Notice of Intent and shall be submitted at least 180 days prior to the expiration date of this General Permit.



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# TASKS PERFORMANCE SUMMARY

**APPENDIX F**

**TASK PERFORMANCE SUMMARY**  
**CAP Modification Activities (CP-70)**  
**Former Cougar Oil No. 40**  
**203 East Mieghan Boulevard**  
**Gadsden, Etowah County, Alabama**

<b>Task Completed by Personnel/Title:</b>	<b>David Dailey, P.E.</b>	<b>Michelle Grantham, SPM</b>	<b>Daniel Roe, PM</b>	<b>Karen Moore, Admin.</b>
<b>Project Management</b>	X	X	X	
<b>Work Plan Preparation/Review</b>	X	X	X	X
<b>Cost Proposal Preparation/Review</b>		X	X	X
<b>Field Work</b>				
<b>Data Interpretation/Tabulations</b>	X		X	
<b>Drafting</b>				X
<b>Report Preparation/Review</b>	X	X	X	X
<b>Payment Request Preparation/Review</b>		X	X	X

Notes:

DO=Drilling Oversight

BL=Boring Log Description/Soil Classification

WG=Well Gauging

GSC=Groundwater Sample Collection

MEME=MEME Oversight

PM=Project Management

O&M=Routine Operation & Maintenance

HRS=High Resolution Study

VM=Vapor Monitoring

FC=Fan Check