

# **ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC**

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**Interim Monitoring and Recovery Well Installation Work Plan  
Gasoline Fueling Station – Royal Farms #96  
500 Mechanic Valley Road  
North East, Cecil County, Maryland 21901**

**OCP Case No. 2011-0729-CE  
MDE Facility No. 13326**

**AEC Project Number: 05-056 RF096**

**Prepared for:**

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Oil Control Program  
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And

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June 28, 2011

***ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC***

**Interim Monitoring and Recovery Well Installation Work Plan**

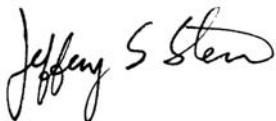


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**Prepared by:** Thomas Ruszin III

**Title:** Project Manager

**Date:** June 28, 2011



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**Reviewed by:** Jeffery Stein, P.G.

**Title:** Principal

**Date:** June 28, 2011

## **INTRODUCTION**

This Interim Monitoring and Recovery Well Installation Work Plan has been developed for Royal Farms Gasoline Fueling Station No. 96 located at 500 Mechanic Valley Road, North East, Cecil County, Maryland (hereinafter referred to as the “Site”). A Site Vicinity and Site Features Map are included in Attachment A as Figures 1 and 2, respectively. This work plan is intended to satisfy certain requirements outlined in a Maryland Department of the Environment (MDE) email, dated June 22, 2011.

On June 8, 2011, AEC was performing an annual groundwater sampling event in accordance with Code of Maryland Regulations (COMAR) 26.10.02.03-04, when approximately two inches of liquid-phase hydrocarbon (LPH) was encountered in groundwater monitoring well MW-3. In accordance with regulations, AEC subsequently reported this suspected release of petroleum to the MDE. As a result of the report of release, the MDE has required several actions including, but not limited to, the daily use of a vac-truck to perform enhanced fluid recovery (EFR) activities on MW-3 and the performance of a boring/temporary piezometer installation program.

EFR activities have been performed on MW-3 for 4-hours per day since June 13, 2011. As of June 27, 2011 a total of 13,806 gallons of fluids (water and LPH) have been recovered of which it is estimated that 276 gallons of this fluid was LPH (based on a 2 percent LPH recovery rate). The LPH thickness in MW-3 has ranged from 0.05 feet on June 25, 2011 to 1.75 feet on July 13, 2011. Between June 16 and June 21, 2011 a total of 24 borings/temporary piezometers were installed across the site. Both soil and groundwater samples were collected from these locations. As of the writing of this plan the laboratory analytical results have not yet been received. Daily groundwater gauging of the piezometer well network has been performed since June 16, 2011. The gauging indicated the following piezometers contain LPH; B-6 (1.20 feet on June 26, 2011); B-10 (1.29 feet on June 24, 2011); B-13 (0.33 feet on June 24, 2011); B-22 (0.77 feet on June 25, 2011); and, B-15, B-8 and B-1 (heavy sheen on June 28, 2011).

The primary purpose of this work will be to install multiple recovery wells in the known LPH impacted area in order to augment EFR activities. The secondary purpose is to install several monitoring wells in areas outside of the LPH impacted area to investigate the extent of the dissolved phase hydrocarbon plume. The following is a description of the scope of work to be conducted:

## **DESCRIPTION OF INVESTIGATIVE METHODS**

### **Monitoring Well Installation and Development Procedures**

Monitoring/recovery well borings will be advanced using hollow stem auger (HSA) methods. Proposed monitoring/recovery well locations are depicted on Figure 3 of Attachment A. Soil samples will be obtained using a split-spoon sampler and Standard Penetration Testing (SPT) procedures. The sampling interval for the borings will be on 5-foot centers from the surface to the termination depth of the boring.

Six recovery wells and three monitoring wells will be constructed using 4-inch diameter and 2-inch diameter, respectively, PVC slotted screen and riser. One of the 4-inch recovery wells will be installed to replace existing MW-3. Existing MW-3 will be properly abandoned by a Maryland-licensed well driller. Based on historic groundwater levels at the Site and vicinity (10 to 12 feet below ground surface (bgs)), the screen length for the monitoring and recovery wells will be approximately 20 feet and the riser length will be approximately five feet. A sand filter pack will be placed to 2-foot above the top of the screen, and a 1-foot thick bentonite seal will be placed above the sand by dropping bentonite pellets into the annular space and hydrating in place. The remainder of the annular space above the bentonite seal will be grouted to the surface and a flush-mounted, bolt-down, steel manhole set in concrete will be installed at the surface. The PVC well head will be secured with a locking cap.

Prior to arriving at the Site and between each soil boring, all hand augers, core barrels, cutting shoes, probe rods, tips, sleeves, pushrods, samplers, tools, and other down hole equipment will be washed using a water rinse. Fuel, lubricants, and other similar substances will be handled in a manner consistent with accepted safety procedures and standard operating practices. Public utility clearances will be obtained prior to the initiation of the sampling program. This will entail contacting Miss Utility at least 72 hours prior to drilling activities. All drilling work will be performed by a State of Maryland-licensed well driller and appropriate well permits will be obtained from Cecil County.

An AEC Field Geologist will log the geologic conditions of the borings and field screen soil cores for volatile organic compounds (VOCs) using a photoionization detector (PID). Soil samples will be collected from each boring. The criteria for selecting the soil samples will be based on elevated PID readings or evidence of impact in soil. All samples will be collected above the water table.

The wells will be developed using surge block and aggressive bailing techniques within one week of installation. At least five well volumes of water will be removed from each well as part of the development process. If a well is bailed dry, the well will be emptied of water five times over a period not to exceed two hours. All development water will be containerized and disposed of off-Site via a vacuum truck.

### **Soil and Groundwater Sampling**

Soil samples will be collected from each boring. The criteria for selecting the soil samples will be based on elevated PID readings or evidence of impact in soil. All samples will be collected above the water table. Groundwater sampling will be performed five days after development of the monitoring wells. Samples will be collected using dedicated high-density polyethylene (HDPE) tubing and a peristaltic pump or a disposable HDPE bailer. Prior to the collection of groundwater samples, AEC will purge at least three well volumes from each monitoring well. Purge water will be handled in the same manner as the development water, as discussed above. In the event that LPH are identified within a monitoring well, the thickness of the LPH will be

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measured to the nearest 0.01-foot. No groundwater sample will be collected from monitoring wells where LPH is identified.

The analytical laboratory will provide pre-preserved sample containers where appropriate. The sample labels will be firmly attached to the container side, and the following information will be legibly and indelibly written on the labels: facility name; sample identification; sampling date and time; preservatives added; and, sample collector's initials. After the samples are sealed and labeled, they will be packaged for transport to a qualified environmental laboratory. The following packaging procedures will be followed: samples will be packaged to prevent leakage or vaporization from the containers; samples will be cushioned to avoid breakage; and, ice will be added to the cooler to keep the samples cool. New sections of nylon rope will be used for the pre-cleaned disposal bailers at each sample location. In addition, a clean pair of new, disposable nitrile gloves will be worn each time a soil and/or groundwater sample is collected.

The soil and groundwater samples will be analyzed for Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) using Environmental Protection Agency (EPA) Analytical Method 8015B, and VOCs, including fuel oxygenates, via EPA Analytical Method 8260.

### **Well Head Elevation Survey and Groundwater Level Gauging Procedures**

The relative elevations of the top of the well casings for the new wells will be determined to within 0.01-feet using a rod and transit. An existing monitoring well will be used for the elevation reference point. Groundwater levels within each monitoring well will be measured using an electronic water level meter accurate to 0.01-feet. The electronic water level meter will be cleaned (Liquinox and water rinse) prior to use in each well.

### **Investigation Derived Waste Management Procedures**

Investigation-derived soil will be containerized in 55-gallon drums, labeled (date of generation, site name/address, source, and contents), and, staged on the Site. The soil drum(s) will be composite sampled and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) via EPA Analytical Method 8021, and TPH DRO and GRO via EPA Analytical Method 8015. These materials will be staged no longer than 90 days before they are characterized, transported and disposed according to applicable United States Department of Transportation (USDOT), EPA, and MDE regulations.

### **Reporting and Scheduling**

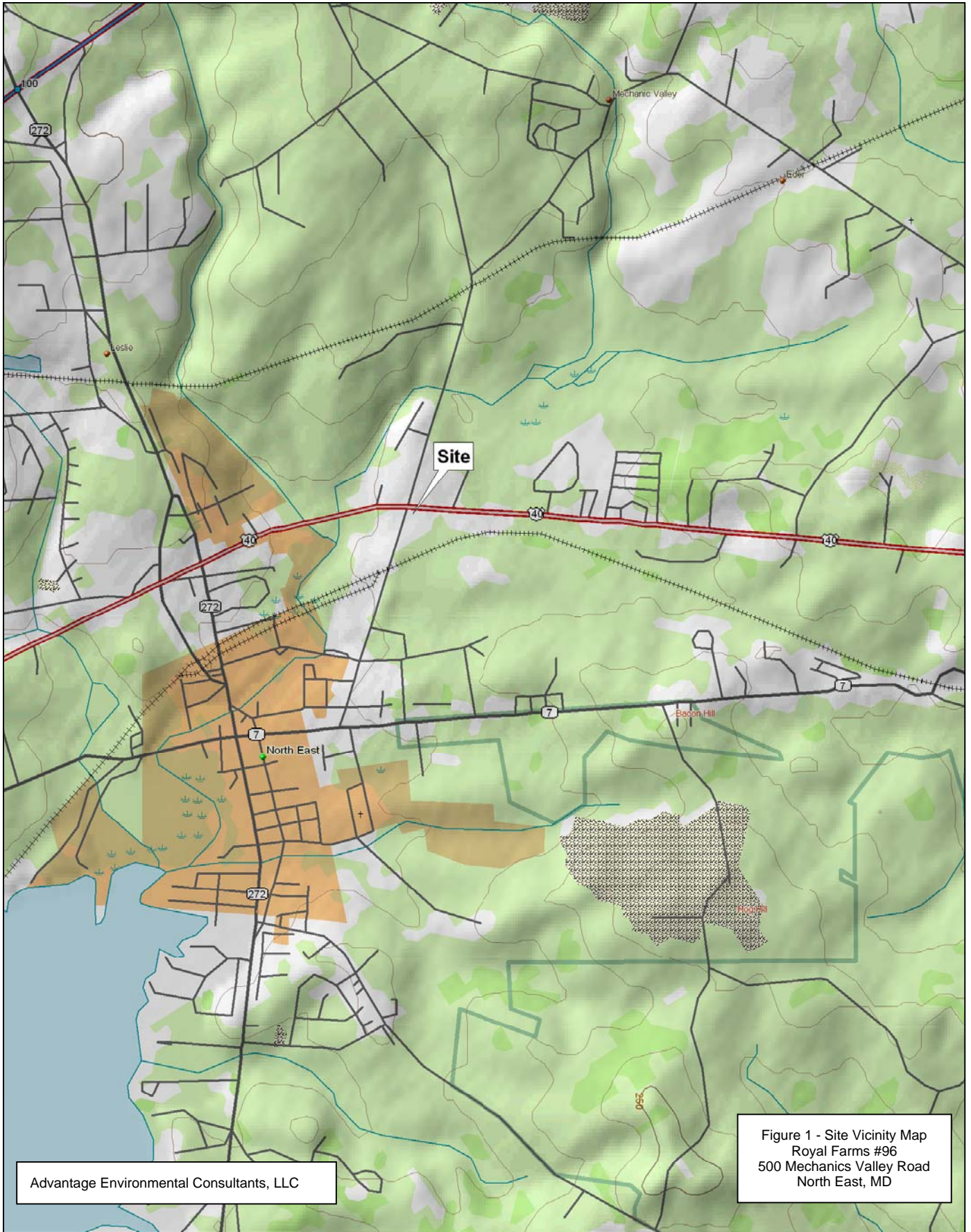
Information developed from the investigation will be assembled into a report including the following information: report summary; physical site description; site vicinity map; sample location map; groundwater gradient map; dissolved, liquid and absorbed phase hydrocarbon delineation maps; description of the sampling program; soil-boring and well construction logs; and, analytical laboratory results. Three hard copies and an electronic copy of the Report will be submitted to the MDE.

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This effort is scheduled to take approximately eight days of field time. AEC can begin field work within five days of MDE Work Plan approval. It is anticipated that a final report can be prepared within four weeks of MDE Work Plan approval.

## **Attachment A**





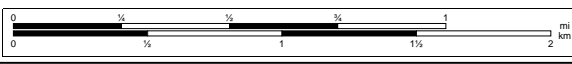
Advantage Environmental Consultants, LLC

Figure 1 - Site Vicinity Map  
 Royal Farms #96  
 500 Mechanics Valley Road  
 North East, MD

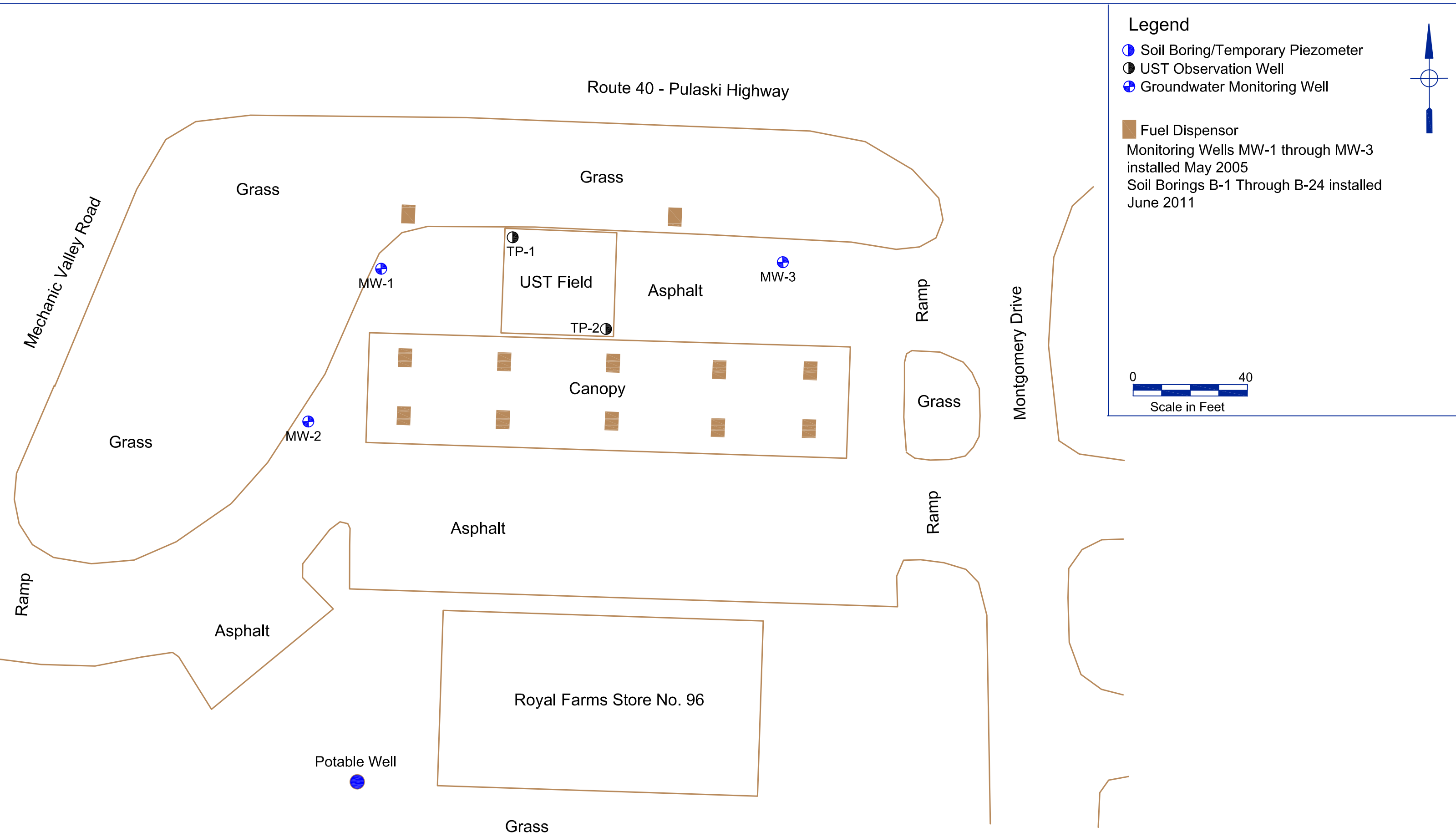


© 2001 DeLorme. Topo USA® 3.0  
 Zoom Level: 12-7 Datum: WGS84

Scale: 1" = 28.125'  
 1" = 2,343.75 ft





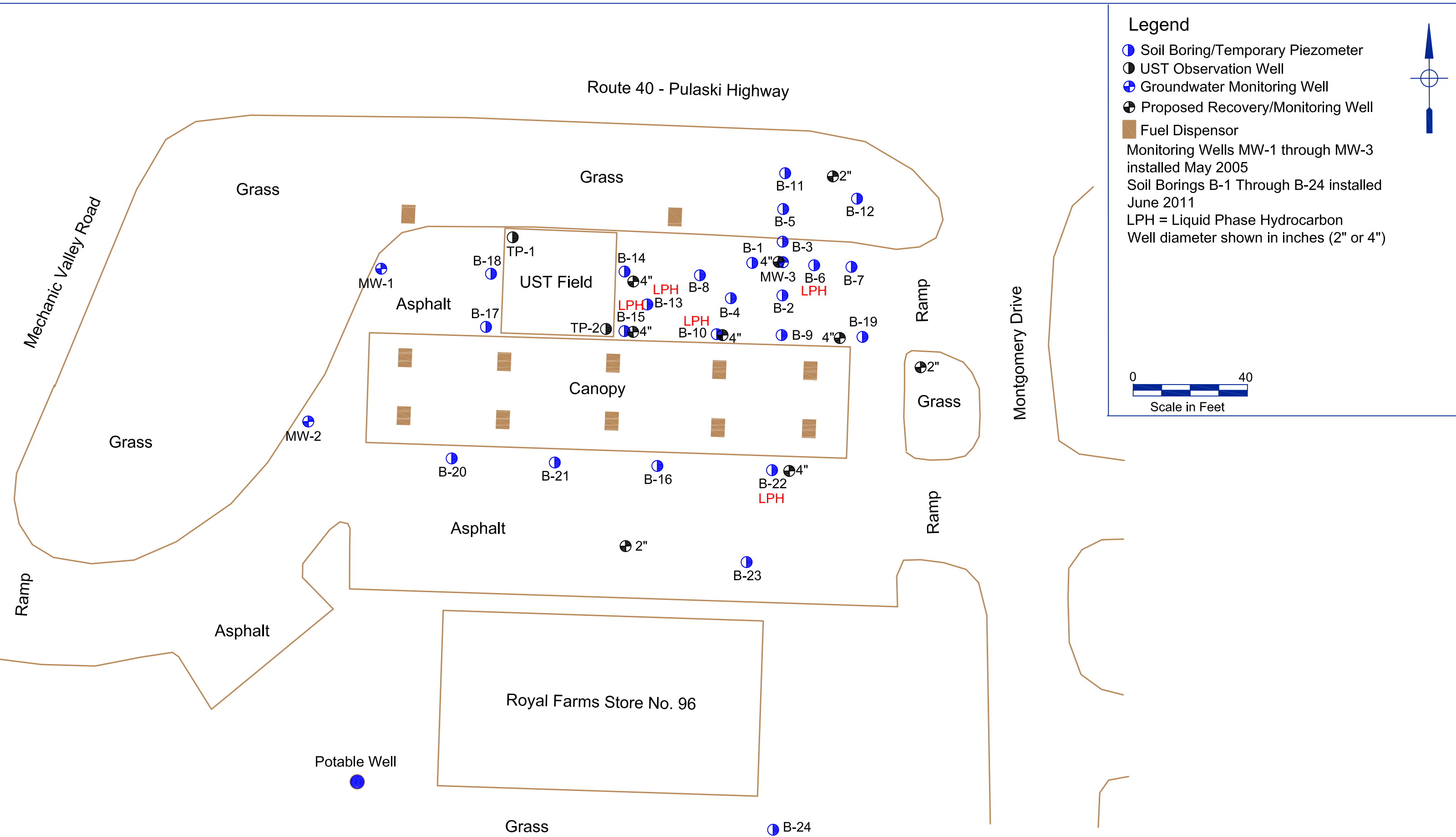


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Project No.: 05-056  
 Task No.: RF96  
 File: Site Features

Drawn by: JSS  
 Date: 6-22-11  
 Revision No.: 1

**Figure 2 - Site Features Map**  
 Royal Farms No. 96  
 500 Mechanics Valley Road  
 Northeast, MD



**Legend**

- Soil Boring/Temporary Piezometer
- UST Observation Well
- ⊕ Groundwater Monitoring Well
- ⊕ Proposed Recovery/Monitoring Well
- Fuel Dispenser

Monitoring Wells MW-1 through MW-3 installed May 2005  
 Soil Borings B-1 Through B-24 installed June 2011  
 LPH = Liquid Phase Hydrocarbon  
 Well diameter shown in inches (2" or 4")

0 40  
 Scale in Feet



<b>Advantage Environmental Consultants, LLC</b> 8610 Washington Blvd. Suite 217 Jessup, MD 20794 Phone 301-776-0500 Fax 301-776-1123	Project No.: 05-056	Drawn by: JSS	<b>Figure 3 - Proposed Recovery/Monitoring Well Location Map</b> Royal Farms No. 96 500 Mechanics Valley Road Northeast, MD
	Task No.: RF96	Date: 6-27-11	
	File:	Revision No.: 1	