

February 24, 2015

Ms. Jeannette DeBartolomeo
Oil Control Program
Maryland Department of the Environment
1800 Washington Blvd, Suite 620
Baltimore, Maryland 21230

Re: **SITE INVESTIGATION WORK PLAN**
MDE Case #2006-0442HA
High's Store #130
4101 Norrisville Road, Jarrettsville (Madonna), Harford County, Maryland
Facility ID No. 2057

Dear Ms. DeBartolomeo:

Groundwater & Environmental Services, Inc. (GES), on behalf of High's of Baltimore, LLC. (High's), respectfully submits this Site Investigation Work Plan in regard to MDE Case #2006-0442HA for the High's Store #130, located at 4101 Norrisville Road, Madonna, MD (Site). As presented in recent email correspondence dated February 16, 2015, GES, on behalf of High's, seeks to install six (6) monitoring wells on the northern (downgradient) end of the Site property. These proposed monitoring wells would consist of three shallow and three deep wells grouped as co-located sets. These shallow and deep well sets would be screened within the overburden water table aquifer. The purpose of the monitoring well installations is to delineate the extent of potential petroleum hydrocarbons, particularly methyl tert butyl ether (MTBE), as it may leave the Site and move in the downgradient direction toward residential wells located within the Charbonnet community.

As you are aware, High's has maintained a potable water monitoring program for select dwellings within the Charbonnet community since the inception of the MDE Case #2006-0442HA. In addition, High's has installed and maintained activated carbon point-of-entry treatment (POET) systems at the 3921 Greenpeak Road and 3914 Madonna Road residences which have demonstrated MTBE concentrations exceeding the MDE Action Levels for the constituent at 20 micrograms per liter ($\mu\text{g/L}$).

It is known to High's that the MDE investigated a leak from a former underground storage tank (UST) located at the Department of Natural Resources (DNR) Madonna Ranger Station, 3919 Madonna Road, Jarrettsville, MD as MDE Case #2009-0539-HA. This case was closed by the MDE on December 17, 2013. Based on information gained from a September 26, 2014 Public Information Act (PIA) request for the Madonna Ranger Station, in addition to potable well and septic information obtained from the Harford County Health Department, GES has advised High's that further investigation of the groundwater flow regime within the Charbonnet community is warranted to determine which party may be responsible for the hydrocarbon impacts to potable wells. The locations of the offsite residential dwellings and the Madonna Ranger Station are illustrated in **Figure 1, Local Area Map**.



Technical specifications related to the installation of the six proposed monitoring wells are as follows:

- Three pairs of 2-inch diameter polyvinyl chloride (PVC) monitoring wells will be installed, with each pair consisting of one shallow well and one deep well. The shallow and deep wells of each pair will be installed approximately 5 feet (ft) apart. The approximate locations of the proposed monitoring wells are depicted in **Figure 2, Site Map with Proposed Monitoring Well Locations**. The final monitoring well locations may be adjusted based on access and utility clearance conditions encountered in the field.
- The shallow wells will be installed with a well screen interval that crosses the top of the water table and extends approximately 10 ft above and below the water table interface for a total of 20 ft of well screen. Shallow well depths are predicted to be approximately 35 to 40 ft in depth.
- Based on a review of well completion reports for potable wells within the Charbonnet community, depth to bedrock is anticipated to occur between 75 to 100 ft below grade surface (bgs) in the proposed drilling locations. Therefore, the deep well installations would terminate at the top of rock and would be constructed with 10 ft of well screen. Top of rock would be confirmed with a 3 to 5 ft core barrel sample to be collected after hollow stem auger (HSA) refusal is encountered during installation at one of the proposed deep wells.
- An off-road capable HSA drill rig with 6-inch diameter augers (minimum) will be used to install the monitoring wells. In the shallow well boreholes, split-spoon soil samples will be collected at 5 ft intervals beginning at 5 ft bgs until the water table is reached at an anticipated depth of 25 to 30 ft bgs or terminal depth of the borehole. In the deep monitoring well boreholes, split-spoon sampling will be completed at 10 ft intervals beginning at the terminal depth of the corresponding shallow monitoring well and will continue until terminal depth or spoon refusal in the deep monitoring well borehole is reached. Soil samples collected from the spoons will be logged for lithology and screened in the field using a photo-ionization detector (PID). The sample eliciting the highest PID response would be submitted for laboratory analysis. If no elevated PID response is observed, then soil samples collected nearest to the observed water table interface will be submitted for laboratory analysis.
- Soil samples submitted to the laboratory will be analyzed for full suite volatile organic compounds (VOCs), including fuel oxygenates and naphthalene using EPA Method 8260 and total petroleum hydrocarbons - diesel / gasoline range organics (TPH-DRO / TPH-GRO) using EPA Method 8015.
- All monitoring wells will be constructed using 0.02 inch slot PVC well screen and annular space of the wells will be packed with #2 Moiré sand to at least 2 ft above the well screen. At least 2 ft of bentonite pellets will be placed above the sand. The annular space above the bentonite will be grouted with Portland cement or a Portland cement/bentonite slurry to the bottom of the steel flush-mounted manholes encased in a concrete pad. A locking, watertight cap will be installed to seal the well and the well permit tag will be installed on the casing of the well or the manhole.
- The monitoring wells will be developed through surge and pumping techniques by a Maryland-licensed driller until a minimum of three well volumes of water have been purged from each monitoring well. Purge water from well development will be containerized and transported offsite for proper treatment and disposal.



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- Groundwater samples will be collected semi-annually from monitoring wells during the existing semi-annual monitoring events and analyzed for full suite VOCs, including fuel oxygenates and naphthalene using EPA Method 8260 and TPH-GRO / TPH-DRO using EPA Method 8015.
- All soil cuttings will be containerized and transported offsite for proper treatment and disposal.

A Site Assessment Report including boring logs, waste removal manifests, soil analytical results, and an assessment of the hydrocarbon plume in relation to the surrounding potable wells will be submitted within 45 days from the completion of the proposed activities. Work will be scheduled following the Department's approval of this Site Investigation Work Plan. GES will notify the MDE five days prior to conducting any field activities related to this Work Plan.

GES appreciates the continued guidance of the MDE on this project. If you have any questions or would like additional information, please contact the undersigned at (800) 220-3606, extensions 3726 or 3717, respectively, or Herb Meade at (410) 261-5450.

Sincerely,

Peter Reichardt
Project Geologist

Gregory Reichart
Project Manager

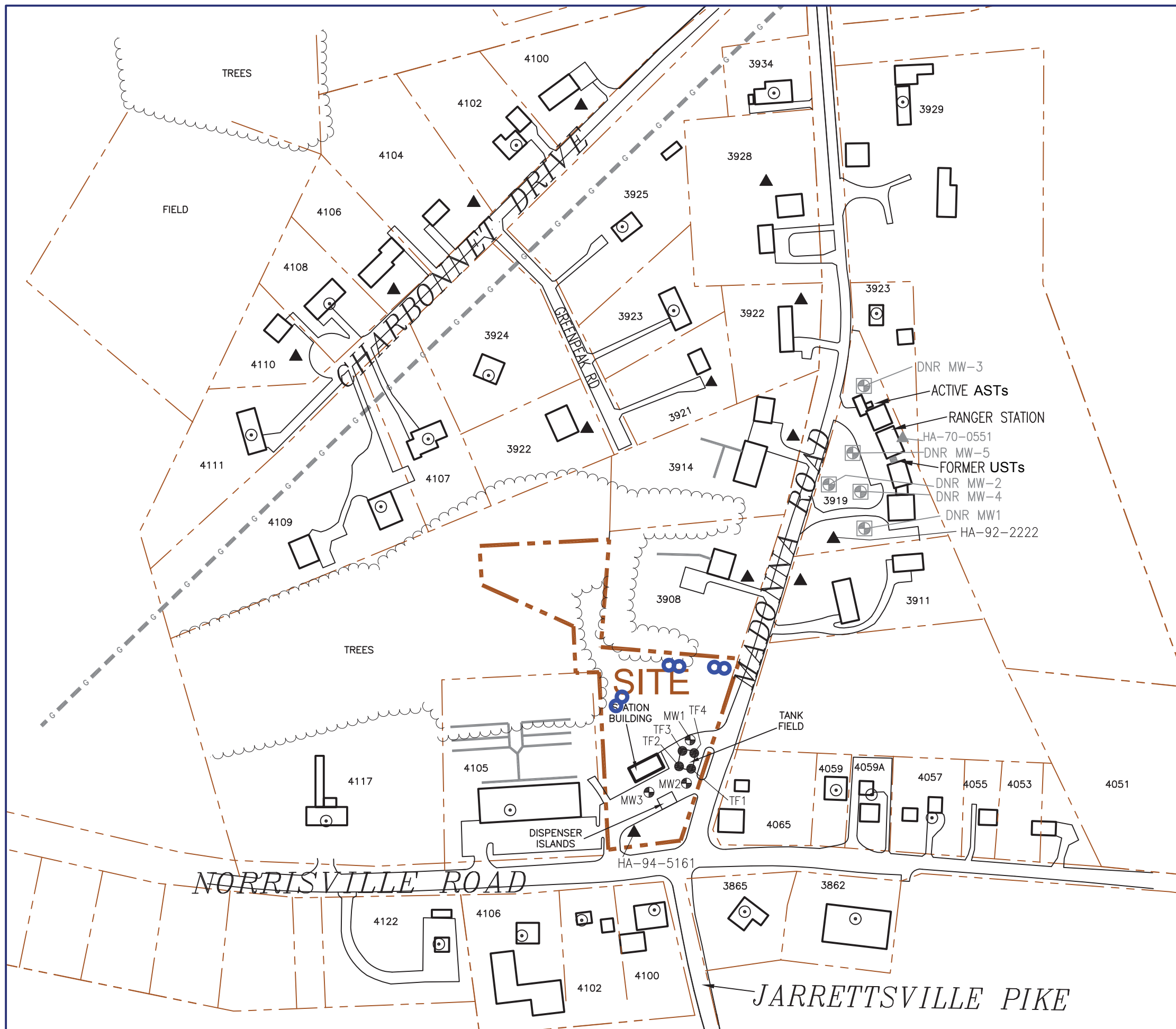
Enclosures

- c: Jeannette DeBartolomeo – MDE (3 additional copies & CD)
Herb Meade – (electronic copy)
Gary Browning – Harford County Health Department (electronic copy)
Todd Passmore – Apex
File – GES, MD (PSID 530803)



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- TANK FIELD WELL
- MONITORING WELL
- POTABLE WELL (CONFIRMED)
- POTABLE WELL (UN-CONFIRMED)
- FORMER MONITORING WELL
- FORMER PORTABLE WELL
- UNDEGROUND GAS PIPELINE
- SEPTIC
- PROPOSED SHALLOW AND DEEP MONITING WELL CLUSTER



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|---------------------------------|--|-----------------|
| DRAFTED BY: W.A.W. (N.J.) | LOCAL AREA MAP | |
| CHECKED BY: DR | HIGH'S STORE #130 4101 NORRISVILLE ROAD MADONNA, MARYLAND | |
| REVIEWED BY: GR | Groundwater & Environmental Services, Inc. 1350 BLAIR DRIVE, SUITE A, ODENTON, MD 21113 | |
| NORTH | SCALE IN FEET (APPROXIMATE) | DATE 2-11-15 |
| | | FIGURE 1 |

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