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New York State Department of Environmental Conservation
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Attn.: Ms. Linda Ross, CPG

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Reference: **Final** Work Plan for Subsurface Investigation
Adjacent Property to Former Standard Portable Facility
21 Valley Street in Mayville, New York
NYSDEC Site # C907030
OP-TECH Project # FD900431

Dear Ms. Ross:

In accordance with your request, OP-TECH Environmental Services, Inc (OP-TECH) has prepared this Work Plan and associated cost estimate to complete a subsurface investigation at properties adjacent to the former Standard Portable facility located at 21 Valley Street in Mayville, New York. This Work Plan identifies the tasks that comprise the scope of work discussed during our site visit on July 24, 2009. During the site visit, the NYSDEC and OP-TECH agreed to the following:

- Completion of land survey and construction of a project base map;
- Completion of two geologic borings (one upgradient and one sidegradient) using a Geoprobe® drill unit;
- Advancement of Geoprobe® borings downgradient of the former Standard Portable facility and upgradient of Chautauqua Lake;
- Analysis of soil samples for volatile organic compounds (VOCs) for comparison to NYSDEC guidance, as well as several soil samples for VOCs, semi-volatile organic compounds (SVOCs), pesticides, PCBs and total metals;
- Installation of approximately 20 micro-wells in the Geoprobe® borings described above;
- Analysis of groundwater samples for volatile organic compounds for comparison to NYSDEC guidance;
- Collection of two synoptic rounds of water levels from groundwater monitoring wells installed on the former Standard Portable site as well as the new groundwater monitoring wells that are installed as part of this scope of work;
- Collection of a water level in Chautauqua Lake as part of the water level measurements; and
- Reporting of findings.

The objective of this investigation is to evaluate the geologic and hydrogeologic conditions downgradient from the former Standard Portable facility, and to characterize the nature and extent of offsite groundwater contamination from the Standard Portable facility.

Figure 1 shows the general site conditions within the project area. The following is a detailed discussion of the scope of work.

WORK PLAN

The proposed work is divided into tasks that include the following work elements:

Task 1 – Work Plan Preparation

This Work Plan has been prepared at the request of the NYSDEC to provide an understanding of the details scope of work that will be completed for this investigation. It also includes an estimate of the amount of time and the costs that will be required to complete the scope of work.

Task 2 – Site Survey and Base Map

A land survey will be completed of the parcels immediately south and east of the Standard Portable property. This information will then be electronically combined with surveys already completed (if available) for the former Standard Portable facility and the Town Park located along Chautauqua Lake. Soil boring and groundwater monitoring wells that are completed as part of this project will be added to the base map. The base map will be provided in CAD format and will be the basis for three dimensional data is collected including construction of water table maps and soil and groundwater iso-concentration maps that will be generated as part of project reporting.

Task 3 – Site Investigation

Task 3A - Pre-Mobilization Activities

Prior to the start of field activities, the following activities will take place:

- A site visit was completed in mid July with NYSDEC personnel to observe the work area and identify potential project concerns;
- Coordinate with NYSDEC for site access and logistics;
- A site specific health and safety plan will be completed to provide guidance regarding local emergency contacts and directions to local medical facilities;
- Notification of Dig Safely New York (formerly the Underground Facilities Protection Organization or UFPO) to allow identification and mark-out of buried utilities of record (i.e., registered with UFPO) beneath the site. This notification must be provided to UFPO a minimum of three business days prior to beginning the investigation; and
- The Project Manager will notify the Town of Mayville of the scope of work and schedule, and will acquire the necessary permits to complete the work.

Task 3B – General Site Investigation Activities

OP-TECH will provide an experienced two-person crew, consisting of an Environmental Hydrogeologist and an Operator to perform the well installation. A Geoprobe® Model 6620DT hydraulic push/percussion hammer soil-probing unit, mounted on rubber tracks will be used to advance the boreholes. Since the work area is a town park, care must be taken to preserve the integrity of the park turf. In the event that the ground is saturated or site conditions are such that the Geoprobe® rubber tracks are “rutting” the park

ground surface, then plywood 4 by 8 foot sheets will be laid down on the ground surface to move the Geoprobe® soil probing unit from location to location during the site investigation.

It is assumed for the purposes of this agreement that the Geoprobe services will be conducted under Level D personal protective equipment (PPE) with nitrile gloves. The work zone will be monitored with photo-ionization detector (PID). If sustained readings of greater than 5 parts per million occur, then work activities will cease, and the NYSDEC will be notified.

A temporary decontamination pad will be set up to assist with decontamination of drilling and sampling equipment, if appropriate. An alternative to this approach will be to use the existing decon pad located at the former Standard Portable site. Drill bits, and equipment that comes into contact with subsurface soils will be decontaminated between each borehole.

Task 3 C – Soil Borings

1. Two geologic borings (SBB-1 and SBB-2) will be advanced outside of the suspected area of contaminated groundwater contaminant plume at the locations noted on Figure 1. The objective of this task is to evaluate the nature of subsurface materials, which are reportedly sands from ground surface to approximately 12 feet below ground surface. A clay unit is reportedly located at approximately 12 feet below ground surface; however the thickness and lateral extent of this unit is unknown. Thus, these soil borings will be advanced to a depth of approximately 30 feet below ground surface, or refusal using a Macro-Core® soil sampler with acetate liners to evaluate the thickness of the clay unit, and to evaluate the nature of the primary aquifer that is reportedly present below the clay unit.
2. In addition, 30 Geoprobe® borings will be advanced downgradient of the former Standard Portable facility and upgradient of Chautauqua Lake along five traverses oriented generally northeast-southwest. These traverse lines are oriented perpendicular to the expected groundwater flow direction (Figure 1). Soil borings are spaced as follows:

Traverse 1 – Soil borings are spaced approximately 50 feet southeast of the Standard Portable property boundary at its closest point. Soil borings are spaced approximately 50 feet apart.

Traverse 2 – Soil borings are approximately 125 feet southeast of the Standard Portable property boundary at its closest point, and approximately 75 feet southeast and sub-parallel to Traverse 1. Soil borings are spaced approximately 100 feet apart.

Traverse 3 – Soil borings are approximately 200 feet southeast of the Standard Portable property boundary, and approximately 75 feet south of Traverse 2. Soil borings in Traverse 3 are spaced approximately 50 feet apart.

Traverse 4 - Soil borings are approximately 275 feet southeast of the Standard Portable property boundary, and approximately 75 feet south of Traverse 3. Soil borings in Traverse 4 are spaced approximately 100 feet apart.

Traverse 5 - Soil borings are approximately 350 feet southeast of the Standard Portable property boundary, and approximately 75 feet south of Traverse 4. Soil borings in Traverse 5 are spaced approximately 50 feet apart.

The layout of these traverses and the locations of specific soil borings along each traverse is conceptual. Since the NYSDEC does not approval to locate soil borings on the NYSDOT property, the locations of soil borings will be adjusted to keep individual soil boring locations off of NYSDOT property.

3. Soil borings will be drilled to a depth of approximately 13 feet, or two feet into the clay unit. A Macro-Core soil sampler with acetate liners will be used to advance the borings and collect soil samples.
4. The recovered soil samples will be characterized with respect to predominant soil types (i.e., gravel, sand, silt, clay), color, and relative moisture content (i.e., moist, wet, saturated); and examined for characteristic petroleum odors.
5. Soil samples will be subdivided into two-foot intervals, and will be screened for volatile organic compounds (VOCs) using a PID equipped with a 11.2eV lamp. The PID screening will be performed by direct-read and headspace screening methods, by placing soil samples in sealable plastic bags, and allowing the samples to warm prior to screening with the PID. The PID screening will be performed on the soil headspace of each containerized sample, to provide a general indication as to the VOC concentrations released from the soil into the sample headspace. The results of the soil sample characterization and PID screening will be recorded on the Geoprobe[®] Investigation Logs for the respective borings.
6. Sample splits with the highest PID headspace reading below the top of the water table at each soil boring location will be placed in clean glassware supplied by the contract laboratory, labeled with a unique sample identification (i.e.; SB-1 (8-10 feet), and then packed on ice. Field screening with a PID and visual observation of the soils will determine which samples will be submitted for laboratory analysis to the contract laboratory, (Test America) using strict chain of custody protocols. A total of twenty (20) soils sample from below the top of the water table will be analyzed for EPA Method 8260 plus Quality Assurance / Quality Control (QA/QC) samples.
7. In addition, soil sample splits with the highest PID readings above the water table at three borings will also be submitted for laboratory analysis using the same criteria described in item #5 above.
8. In total, twenty soil samples from below the top of the water table, and three soil samples from above the water table and QA/QC samples will be submitted to the contract laboratory for analysis.
9. Because of the presence of known groundwater contamination immediately upgradient, any drill cuttings, PPE, decontamination water or other investigative derived waste generated during advancement of the 30 soil; borings will be containerized in 55 gallon drums.

Task 3 D – Groundwater Monitoring Wells

10. Micro-wells (one-inch diameter) will be installed in 20 of the 30 soil borings that are advanced to evaluate groundwater quality downgradient of the former Standard Portable site and evaluate how far groundwater contamination has migrated off site. Newly installed wells will be numbered GPW-1 through GPW-20 to differentiate these wells from wells already installed at the former Standard Portable site, which is immediately adjacent to the project area.

11. One-inch diameter schedule 40 PVC monitoring wells (micro-wells) will be placed in borings advanced to approximately 14 feet, or approximately two feet into the clay unit. The micro-wells will have a ten-foot screen (with 0.010-inch slots) from approximately 13 to 3 feet below ground surface and compatible one-inch diameter schedule 40 PVC riser pipe at the selected boreholes. Following placement of the well screens, the casing will be withdrawn from each borehole, and then the annular space surrounding the screen will be filled with No. 1 silica sand, extending approximately one foot above the top of the screen. A bentonite seal comprised of hydrated granular bentonite will be placed above the sand pack to grade.
12. Threaded 1-inch I.D. PVC plugs will be installed at the bottoms of the monitoring wells and lockable j-plugs will be installed at the top of the PVC casings. The surface components of the wells will be protected with protective flush-mounted curb boxes, embedded in concrete that are approximately two inches below the ground surface (per NYSDEC request).
13. The ten borings where micro-wells are not installed will be plugged using granular bentonite that is tremmie grouted from the bottom of the borehole to ground surface.
14. Once installed, the newly installed monitoring wells (designated GPW-1 through GPW-20) will be allowed to set up for a minimum of one week. The newly installed micro-wells will then be developed using disposable PVC bailers (to remove fines), and then with peristaltic pump and tubing. A minimum of 10 well volumes will be removed during well development, with purged water monitored for pH, temperature, conductivity and turbidity. Well development information will be recorded on Well Development Logs for each specific micro-well.
15. Because of the presence of known groundwater contamination immediately upgradient, development water will be containerized in 55 gallon drums that will be clearly marked for subsequent disposal purposes. All drummed soil, purge water and investigative derived waste will be staged on-site at a location selected by the NYSDEC.
16. Prior to the collection of groundwater samples, one synoptic round of groundwater elevations will be collected from the 20 newly installed ground water micro-wells and 10 of the existing site monitoring wells located at the former Standard Portable site. In addition, a water elevation will be noted for Lake Chautauqua. This will be accomplished by marking the water level using paint on the retaining wall at the Park beach along Lake Chautauqua.
17. Groundwater samples will then be collected from 20 newly installed wells, along with approximately 10 existing wells located at the former Standard Portable site using low flow sampling methods using a peristaltic pump using dedicated tubing for each respective groundwater sampling point.

Task 3 E – Sampling and Analysis

18. A total of 23 soil samples (20 from below the water table and three from above the water table at selected borings (along with the appropriate QA/QC samples) will be collected and submitted to the contract laboratory for analysis for target compound list (TCL) volatile organic compounds (VOCs) using USEPA Method 8260. In addition, six of these soil samples will be analyzed for TCL semi-volatile organic compounds (SVOCs) using USEPA Method 8270; TCL pesticides using USEPA Method 8081; TCL polychlorinated biphenyls (PCBs), using USEPA Method 8082, and target analyte list (TAL) metals using USEPA Method 6010, plus cyanide.

19. Thirty groundwater samples (20 from the new micro-wells and 10 from existing wells at the Standard Portable facility), a matrix spike/matrix spike duplicate, a field duplicate and trip blanks will be submitted to the contract laboratory for analysis for TCL-VOCs using USEPA Method 8260. In addition, three of the groundwater samples will also be analyzed for SVOCs using USPA Method 8270, TCL pesticides using USEPA Method 8081; PCBs using USEPA Method 8082, and TAL metals using USEPA Method 6010, plus cyanide. Test America, certified under the New York State Department of Health's Environmental Laboratory Approval Program (ELAP), will conduct analysis of both the soil and groundwater samples on a standard two-week laboratory turn-around-schedule. Test America will contract directly with the NYSDEC.
20. All investigative derived waste will be analyzed for proper disposal.
21. A second synoptic groundwater sampling event will be completed one month after the first groundwater sampling event. However; only water level measurements will be collected from the same off site and on-site wells that were previously sampled.

Task 4 – Site Investigation Report

A site investigation will be prepared that will provide a discussion of the field activities that were completed for the site investigation as well as the following:

- Site survey map;
- Soil boring logs;
- Well construction diagrams;
- Groundwater monitoring well data showing screen length, screen placement, well coordinates, and depth to groundwater in tabular format;
- Well development logs;
- Well sampling logs;
- Analytical results of soil and groundwater samples in tabular format;
- Water table maps from two groundwater elevation measurement events that were part of the investigation; and
- An iso-concentration map of total VOCs in groundwater within study area, or a box and whisker plot of individual constituents will be provided.

Per the request of the NYSDEC, recommendations for additional work will not be provided as part of this report.

ESTIMATED PROJECT COSTS

A cost estimate has been provided under separate cover that provides a task by task breakdown of expected costs.

SCHEDULE

OP-TECH understands that this work will be completed in November, 2009, or as early as possible.

ASSUMPTIONS

The following assumptions were made for the preparation of this work plan:

1. OP-TECH will complete this work in accordance with the terms, conditions and rates of the Standby Remedial Services Contract between the NYSDEC and OP-TECH.
2. OP-TECH will complete this work as a prevailing wage project, except for professional services, since the work is on public land.
3. Based on the distance to the site, standard contract per-diem (meals and lodging) will apply.
4. OP-TECH will have free and ready access to the work site and a staging area the equipment and materials.
5. OP-TECH will assume no responsibility or liability for damages resulting to or as a result of unidentified and/or incorrectly marked utilities, nor shall such damage be construed as a breach of contract or other inability on the part of OP-TECH to satisfy the terms of this Agreement.
6. There are no laboratory analytical costs included in this estimate. OP-TECH assumes that NYSDEC will contract directly with Test America using the existing contract between NYSDEC and Test America Laboratories.
7. Transportation and disposal costs have not been included in the cost estimate since these costs will be dependent on analytical results and quantities generated for disposal.
8. OP-TECH will assume no responsibility for waste materials generated in the course of the investigation, or for contamination, hazardous waste, or hazardous substances generated, discovered, collected, transported, or released during the remedial activities.
9. The work will be completed at Level D PPE.
10. Rates that will be provided will be based on a 10-hour work day. NYSDEC will provide a letter authorizing overtime and per-diem prior to the start of work.

CLOSURE

Please feel free to contact our office should you have any questions regarding this Work Plan. We look forward to working with you on this project.

Respectfully,
OP-TECH



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