STATE SUPERFUND STANDBY CONTRACT WORK ASSIGNMENT
TYPE OF CONTRACT: COST PLUS FIXED FEE
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Hidden Valley Electronics, East Vestal (T), Broome County, Site No. 7-04-029
NYSDEC Project Manager: David Camp
Telephone: (518) 402-9768

March 24, 2004

I. Summary of Site History and Background Information

The Hidden Valley Electronics (HVE) Site is located at 1808 Vestal Parkway in the Town of East Vestal, Broome County, New York, as shown on Figure 1. The site is situated on a 4.5 acre parcel and consists of a main building and an annex. The building currently houses retail businesses including a fitness center, radio station, bridal boutique, optician and an insurance company. The area surrounding the building is paved. Land use in the vicinity of the site is a mix of commercial and residential. The former Miller's Sunoco service station is located within the northeast corner of the property. The site features are shown on Figure 2.

Electronics equipment was manufactured at the site from the mid 1960s until 1995. From the mid 1960s until 1991, the manufacturer was Federal Electronics, Inc. (a.k.a. Harvey Electronics, Inc.). Hidden Valley Electronics, Inc. purchased the assets in December of 1991 and manufactured electronics at the site until March of 1995, when it relocated to Apalachin, New York. The property is currently owned by C. G. Properties, LLC.

Past operations at the facility appear to have contaminated the groundwater with trichloroethene (TCE) and 1,1,1-trichloroethane (TCA). These compounds were was first identified at the site during the investigation of a petroleum spill at the Miller's service station in 1994 and 1995. TCE and TCA were detected in several of the wells during that investigation to a maximum concentration of 546 ppb.

An investigation by O'Brien & Gere was conducted in 2001 on behalf of the site owner. That investigation consisted of soil and groundwater sampling around the building and sampling of the septic tank, located west of the HVE building. Relatively low concentrations of VOCs were detected in the soil samples and are not indicative of source materials. TCA and TCE were detected in the groundwater samples from up to 470 ppb and 780 ppb, respectively. Highest concentrations in the groundwater were detected adjacent to the building annex (monitoring wells TW-1 and TW-5, as shown on Figure 3). Based on this data, a source is suspected beneath the footprint of the building, most likely within the annex. The results of this investigation is presented in O'Brien & Gere's February 14, 2002 letter report (enclosed as Attachment 1).

The site is located over a primary drinking water aquifer which provides potable drinking water to most of the local population. Groundwater flow in the vicinity of the site is to the northwest towards the Susquahanna River, located approximately one-half mile to the north of the site. Based on the 2002 O'Brien & Gere report, the depth to groundwater in the vicinity of the site is approximately 6 feet to 15 feet below grade, a clay layer was identified on-site at approximately 20 feet below grade, and bedrock was encountered on-site at 38 feet below grade.

During the Miller's station spill investigation and remediation thirty-three monitoring wells were installed on-site and downgradient. Four recovery wells were installed as part of two groundwater recovery and treatment systems to remediate the gasoline plume. These wells are shown on Figures 2 & 3. In addition, five vapor extraction points were located on the south side of Vestal Parkway and twelve vapor extraction points and nine air sparging points on the north side of Vestal Parkway.

II. Scope of Work and Task/Subtask Descriptions

Services required of the standby consultant include the development and implementation of a phased remedial investigation/feasibility study (RI/FS). The RI will provide a thorough characterization of the nature and extent of contamination originating at the site and will provide the necessary data to complete the FS. The FS will identify and evaluate the alternatives available to remediate the site and will be used as the basis for selecting a final remedial alternative. Once the RI/FS is complete, the NYSDEC will prepare the proposed remedial action plan (PRAP) and record of decision (ROD), which will describe the remedy selected for the site.

This work assignment may include Interim Remedial Measures (IRMs) to mitigate source areas and indoor air issues.

The tasks and approach to be used in completing the RI/FS shall be in accordance with Schedule 1 of the Standby Contract; the most recent versions of the guidance documents specified in the NYSDEC's Division of Environmental Remediation's (DER's) Technical and Administrative Guidance Memorandum (TAGM) HWR-89-4025, "Guidelines for Remedial Investigations/Feasibility Studies"; TAGM HWR-90-4030, "Selection of Remedial Actions at Inactive Hazardous Waste Sites"; and the most recent version of the DER's "Technical Guidance for Site Investigation and Remediation" (DER-10). The main project tasks and a description of each task is listen below.

Task 1 - Work Plan Development

The consultant will examine available information and develop a detailed RI/FS work plan. Development of the work plan will be a two-step process as described below. The goal is to obtain final approval of the work plan, budget and associated documents so that a Notice to Proceed with the work can be given within 90 days of issuance of the work assignment.

Subtask A - Project Scoping Plan:

The following activities will be performed under this phase:

1. Review all background information and reports, including the February 14, 2002 letter report by O'Brien & Gere's (Attachment 1).

2. Conduct a site visit with the consultant and NYSDEC representatives. The site visit will be scheduled within two weeks of the consultant's acceptance of this work assignment.

3. A scoping session will be held by telephone conference within one week of the site visit. The consultant will provide an outline/summary of the anticipated scope of

work to the NYSDEC project manager at least two days prior to the scoping session.

4. Sumittal of a project scoping plan within one week of the scoping session which will include:

   a. A statement of the overall scope of work for the RI/FS.

   b. The level of effort and budget for Task 1A and 1B.

   c. Field activities plan for the RI.

   d. Preliminary level of effort and budget for the RI/FS.

   e. Preliminary estimate of the project schedule including milestones and deliverables.

   f. Project staffing plan identifying key management and technical staff members to be assigned to the work assignment, with resumes and a listing of their areas of responsibility.

   g. Identification of work items to be subcontracted including a minority/women owned business enterprise (M/WBE) utilization plan and equal employment opportunity (EEO) utilization plan.

All technical components of the RI/FS will be worked out and agreed upon by both parties as well as a level of effort for completing Task 1B.

Subtask B - Final RI/FS Work Plan:

After NYSCEC approval of the project scoping plan the consultant will proceed with the development of the final RI/FS work plan. The final RI/FS work plan and budget must be acceptable before a notice to proceed can be issued. Once the work plan is approved by the NYSDEC a notice to proceed will be issued to the consultant for implementation of the RI/FS. The target for this action is within 90 days of the issuance of the work assignment. The final RI/FS work plan will contain the following:

1. Summary of existing information.

2. Scope of work.

3. Field Activities Plan (FAP). The FAP will provide all pertinent information on field work, sampling locations and methods, the approximate number of samples to collected and analyzed, parameters to be analyzed, analytical methods, monitoring well construction details, and a detailed project schedule.

4. Site specific Quality Assurance Project Plan (QAPP). All sampling will be performed according to the appropriate QAPP. The collection of appropriate soil and groundwater samples is essential for this site. The consultant will use the October 1995 NYSDOH Analytical Services Protocol (ASP).

As a rule, ASP must be followed unless the consultant is otherwise directed by the NYSDEC. Cases may occur where non-ASP methods will be appropriate to achieve lower detection limits for evaluation of remediation goals and standards or to analyze for hazardous substances.

All quality assurance protocols, both ASP and non-ASP, must be provided for in the QAPP and approved by NYSDEC. Deviations from protocols specified in the QAPP may be approved in advance by the NYSDEC. Consequently, it is imperative that the consultant's quality assurance officer maintain close contact with both the NYSDEC and the analytical laboratory to correct any analytical problems that may arise during analysis. All analytical data must be accompanied by a Data Usability Summary Report (DUSR) (see Attachment 2).

5. Site specific Health and Safety Plan (HASP). The HASP will be utilized during the field activities at the site. It will address the site specific hazards to on-site personnel and the community and strategies to handle these hazards according to the guidelines normally used by NYSDEC. This should include but is not limited to:

   a. A purpose (i.e., the HASP has been designed to protect the health and safety of on-site personnel and the surrounding community during remedial activities at the site or that adherence to the HASP will minimize the possibility that personnel at the site or the surrounding community will be injured or exposed to site-related contaminants during remedial activities).

   b. A discussion of the intent to make prior notifications to local police, fire, and potential emergency responders advising them of the remedial activities and schedule of events and an intent to notify adjacent property owners so that necessary precautions are taken such as closing windows and air-conditioning vents.

   c. A section on community health and safety including methods by which the public will be contacted in the event of an emergency and a corresponding evacuation procedure, monitoring information, and contaminant action levels.

   d. Site worker personal protection equipment.

   e. A discussion of Community Air Monitoring with real-time air monitoring for volatile organic compounds (VOCs) and particulates at the perimeter of each designated work zone during ground-intrusive activities. The intent is to provide a measure of protection for site workers and the downwind community from potential exposure to airborne contaminant releases as a direct result of work activities. Action levels for particulates and VOCs should be discussed. The NYSDOH recommends that, because intrusive activities may potentially release airborne contaminants in the form of dust or vapors, continuous real-time monitoring be performed at the downwind perimeter of each exclusion/work zone when ground intrusive activities are in progress.

Particulate monitoring will not be necessary when work is done in a non-source area, unless dust is being generated. When invasive field work is creating dust or is being done in a source area, community air monitoring will be done in accordance with the NYSDOH Generic Community Air Monitoring Plan (Attachment 3).

6. Community Participation Plan (CPP). The CPP will include a list of document repositories, a site mailing list and a discussion of those tasks necessary to assist the NYSDEC with public meetings. This will include travel to public meetings, preparation of presentation materials, mailing of fact sheets, etc.

7. M/WBE and EEO Utilization Plan.

8. Detailed budget for the entire work assignment.

9. Final RI/FS project schedule which includes dates for achieving key milestones.

Task 2 - Remedial Investigation

After work plan approval and issuance of the NTP, the consultant will be required to start field activities per the schedule provided in the approved work plan. Field investigations will be conducted to determine the nature and extent of contamination at the site and to determine the extent to which these contaminants pose a threat to human health and the environment. It is anticipated that the consultant will conduct the following subtasks to achieve the RI objectives:

1. Historic Records and Title Search: All available historic information (documents, maps, aerial photos, etc.) and titles shall be located and reviewed. Potential sources and areas of contamination will be identified. The history of all site activities that could have contributed to site contamination shall also be reviewed as needed.

2. Base Map Development: Prior to initiation of on-site RI activities, a base map of the site and immediate vicinity must be developed. All relevant features of the site and adjacent areas will be plotted at a scale of 1 inch equals 50 feet. Relevant features include, but are not limited to, all structures, buildings (including partition walls and floor drains within the HVE building), roads, fences, existing wells, underground utilities and drains, fire plugs, and power poles. The base-map will be used to accurately plot all soil samples, soil borings, monitoring wells, past and present above ground and below ground tank locations, and all other media sampling locations.

3. Building Inspection: The building will be inspected to identify suspected source areas, such as floor drains or dry wells, and building features, such as foundation type and condition. Potential vapor intrusion routes will be noted.

4. Drain Investigation: Floor drains in and around the HVE building will be investigated to determine if they are a possible contaminant source. Sediment present in floor drains will be sampled. A dye tracer study will be performed to determine which drains are connected and provide information on drain lines where soil sampling may be targeted.

5. Soil Gas Sampling: Soil gas sampling and sub-slab sampling will be utilized to identify the location of potential source areas in and around the the HVE site building and aid in the delineation of the extent of soil contamination. Samples will be analyzed using method TO-14. Attachment 4 contains the protocol used previously by the NYSDEC.

6. Indoor Air Sampling: Based on the results of the soil gas and sub-slab sampling, building inspections and the location of potential or confirmed source areas, indoor air sampling may be required in the HVE building. The protocols for this sampling are provided in Attachments 4 and 5. Based on the extent of the downgradient plume, indoor air sampling and sub-slab sampling of off-site buildings may be required.

7. Subsurface Soil Sampling: Sufficient soil samples will be collected to identify source area and define the extent of contamination above SCGs. Prospective areas of contaminated soil will be identified and sampled both around and underneath the HVE site building. Sampling areas will include locations where high soil gas readings were obtained and verified and/or suspected source areas, such as past and present drum storage areas, loading areas, above and below past and present tank locations, leaching pools, septic tanks, etc. The first round of samples will require analysis for VOCs, PCBs and TAL metals, however, it can be assumed that additional rounds can be analyzed for VOCs only. A representative number of samples will also be analyzed for total organic carbon. Background samples from un-impacted areas of the site and site vicinity will be collected and analyzed for metals. The extent of soil contamination in excess of SCGs must be defined. Sample collection using direct push techniques can be considered, but is unlikely to be applicable for this site given the presence of gravel in the overburden (see the O'Brien & Gere report, Attachment 1, page 2).

8. Monitoring Wells: Additional monitoring wells shall be installed to supplement or replace existing wells, if necessary, to define the distribution of groundwater contamination in the overburden aquifers. The groundwater plume in excess of SCGs must be defined in its entirety. Based on the results of the overburden contamination and site geology, monitoring of the bedrock aquifer may also be required.

9. Groundwater Sampling: New and existing monitoring wells shall be sampled to determine the extent of the groundwater plume. Sufficient groundwater elevations will be recorded to confirm the direction of groundwater flow. A minimum of one round of ground water samples will be retrieved and analyzed from each of the groundwater monitoring wells believed to be within the plume. In order to determine any trends in groundwater contamination, the consultant will have to conduct additional rounds of groundwater sampling. The consultant will record all groundwater physical information as appropriate (ie ph, temperature, turbidity, conductivity, elevations, etc). The first round of sampling will be analyzed for TCL VOCs, PCBs, and TAL metals. For cost purposes it can be assumed that subsequent rounds will only be analyzed for VOCs.

10. Survey: Upon completion of the field work, the location and elevation of each of the wells and other sampling points must be established by a NYS licensed surveyor. Elevations of all new and existing wells and piezometer casings and the

corresponding locations will be determined to within 0.01 feet, based on a USGS datum and added to the site base map.

11. State Standards, Criteria, and Guidance Values (SCGs): SCGs for each contaminant detected will be identified and compared with existing conditions on the site in order to form a basis for selection of remedial measures.

12. Data Validation/Usability Report: All samples that are collected must be evaluated by the consulting firm. A usability analysis will be conducted by the consultant's quality assurance officer and a data validation/DUSR will be submitted to the NYSDEC. The laboratory performing the analysis of samples must be properly certified by the NYSDOH and meet USEPA standards. All sample analysis must conform to the QAPP and be accompanied by a DUSR.

13. Exposure Assessments: A qualitative human health exposure assessment will be performed to characterize the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating contaminant fate and transport. Any pathways for environmental exposure to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands, will be identified.

14. Remedial Investigation Report: The consultant will prepare the RI report containing all information gathered and the consultant's interpretation of this data. The consultant shall submit three draft copies of the RI report for review and comment, and three copies of any supplemental RI reports. The consultant will also be required to submit electronic copies of site figures produced in AutoCAD or DXF format. Once the RI is approved by the NYSDEC, the consultant shall submit seven copies of the final RI report and the complete report and appendices in electronic PDF format.

Task 3 - Feasability Study

The consultant will perform an FS by collecting and using all information available and necessary to evaluate remedial alternatives that are applicable and appropriate for the site. The following are the major tasks that are required:

1. Development of Remedial Alternatives: Preparation of a list of potential alternatives that may be used to remediate the site using the information generated in Tasks 1 & 2.

2. Preliminary Screening of Alternatives: The potential alternatives will be screened using the following criteria: effectiveness, feasibility, and cost. A list of alternatives that pass the initial screening will be provided to the NYSDEC for review. Based on NYSDEC review, a final list of alternatives will be prepared for evaluated in detail.

3. Detailed Analysis of Alternatives: The detailed analysis of alternatives will include further refinement and/or modification of alternatives based on the results of the engineering analysis and the findings of the RI. The detailed analysis will include evaluation of each alternative against the following seven evaluation criteria:

a. Overall protection of human health and the environment
b. Compliance with SCGs
c. Long term effectiveness and permanence
d. Reduction of toxicity, mobility and volume
e. Short term effectiveness
f. Implementability
g. Cost

The FS report will include discussions of each of these evaluation criteria for each of the alternatives or technologies under consideration, a comparative analysis, and a summary. Cost estimates for each remedial alternative will also be included in the FS report.

4. Selection of Remedy and Report Preparation: The consultant will recommend a preferred remedy that is protective of the public health and the environment, complies to the maximum extent practicable with SCGs and remedial action objectives, reflects a preference for treatment over simple disposal and is cost effective. The consultant will prepare a conceptual plan for implementing the preferred alternative and will verify its feasibility.

5. Report Submittal: The consultant shall submit three draft copies of the FS report for review and comment. The consultant will also be required to submit electronic copies of site figures produced in AutoCAD or DXF format. Once the FS report is approved by the NYSDEC, the consultant shall submit seven copies of the final report and the complete report and appendices in electronic PDF format.

6. Public Participation: The consultant will assist the NYSDEC in citizen participation activities such as public meetings or hearings as requested by the NYSDEC. At least one public meeting will be held near the site to present and discuss the final RI/FS report and the NYSDEC's Proposed Remedial Action Plan. The consultant will make preparations, presentations, and conduct the public meeting jointly with the NYSDEC.

Task 4 - Interim Remedial Measures (IRMs)

If local areas of contamination are identified and source areas could be appropriately mitigated by initiating an IRM, or if mitigative controls are needed to address vapor intrusion exposure pathways, the consultant may be tasked to perform an IRM. If the NYSDEC requests such work under this work assignment, an amendment to the budget would be negotiated with the consultant.

III. Estimate of Work Assignment Budget

Period of Performance

The NYSDEC has estimated that this work assignment should not exceed 420 days after the RI/FS work plan is approved and the notice to proceed with the RI/FS is given.

Work Plan Development Cost

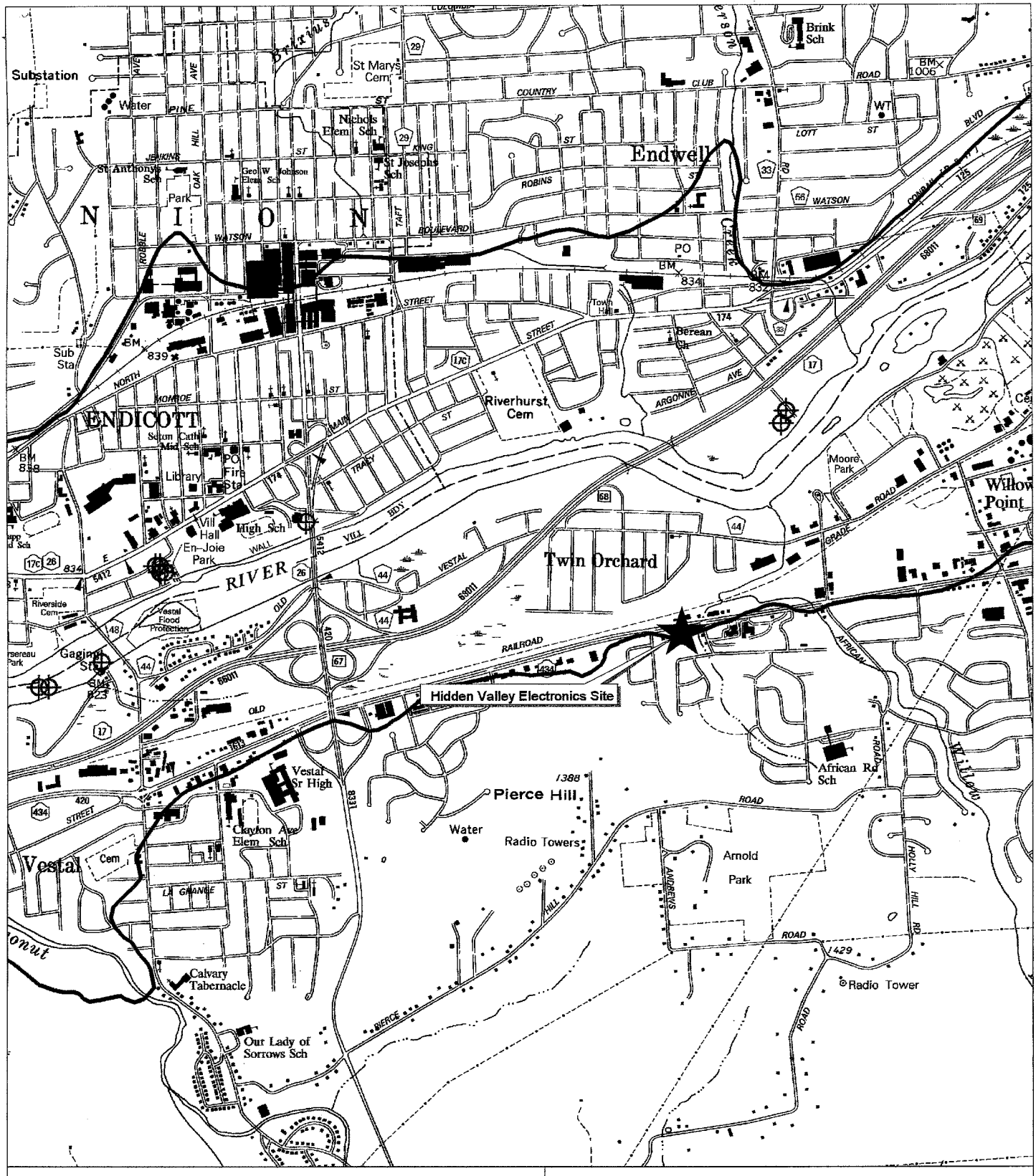
The NYSDEC has estimated that the cost for performing Task 1 (work plan development) should be approximately $15,000.

RI/FS Schedule and Budget

The NYSDEC has estimated the complete RI/FS schedule and budget below.

Task	Description	Days from Start	Labor/Indirect	Subcontracts	Total Estimate
1	Work Plan Development	90	$15,000	$ 0	$15,000
2	RI	390	$115,000	$100,000	$215,000
3	FS	510	$20,000	$0	$20,000
4	IRMs	TBD	TBD	TBD	TBD
	Totals		**$150,000**	**$100,000**	**$250,000**

TBD - To be determined.



Public Suppy Wells

Proposed Class 2 Site

Primary Aquifer

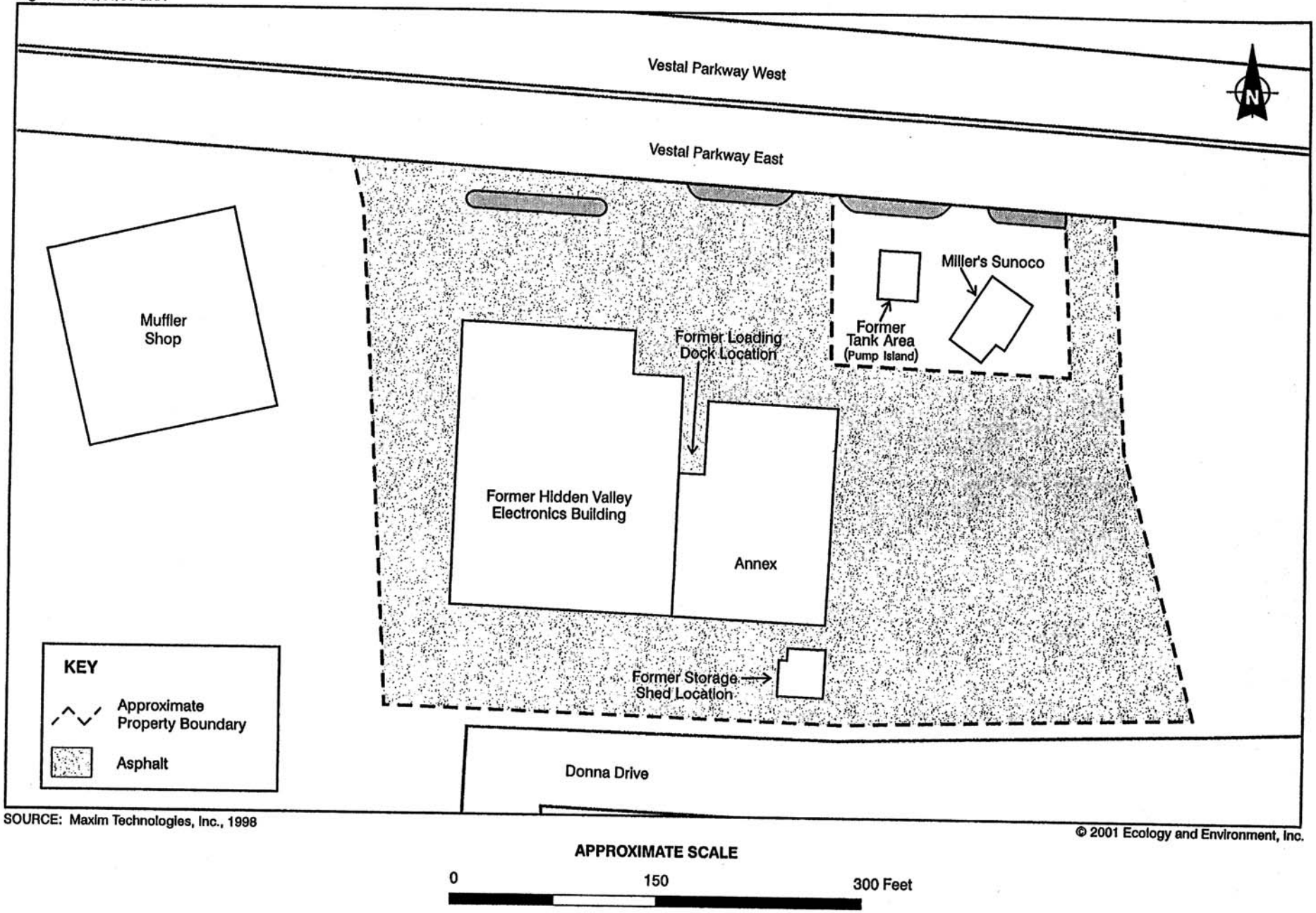
N

Hidden Valley Electronics Site
Vestal New York

03/05/02

FIGURE 1

02:000699_NV01_01-B0707
Fig2-2.CDR-6/01/01-GRA



SOURCE: Maxim Technologies, Inc., 1998

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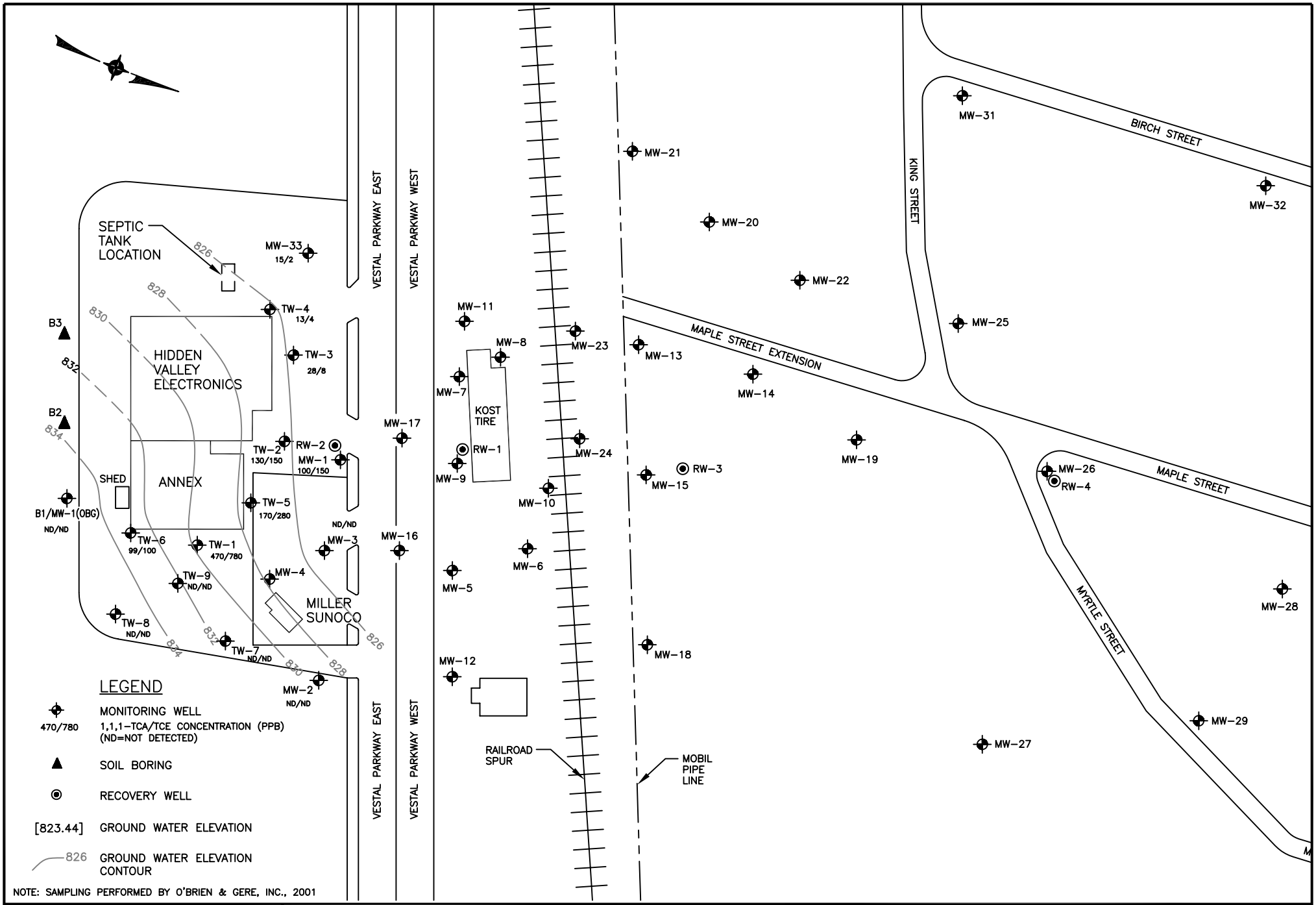
APPROXIMATE SCALE

0 150 300 Feet

Figure 2 **SITE FEATURES MAP, HIDDEN VALLEY ELECTRONICS SITE, VESTAL, NEW YORK**



HIDDEN VALLEY ELECTRONICS
VESTAL, BROOME COUNTY, NEW YORK, SITE NO. 7-04-029

GROUNDWATER CONCETRATIONS, 2001

FIGURE 3

Attachment 1

February 14, 2002

Mr. A. Joseph White, P.E.
Environmental Engineer II
New York State Department of Environmental Conservation
Bureau of Hazardous Site Control
625 Broadway, 11th Floor
Albany, NY 12233-7014

Re: Former Hidden Valley Electronics Site

File: 6755/25607

Dear Mr. White:

On behalf of C.G. Properties, L.L.C, O'Brien & Gere Engineers, Inc. (O'Brien & Gere) is submitting to the New York State Department of Environmental Conservation (NYSDEC) the results of subsurface investigations conducted at the former Hidden Valley Electronics site located on State Route 434 in Vestal, New York (Figure 1). Below is a summary of the implementation of the subsurface investigations. In addition, attached are the analytical results and Data Usability Summary Report (DUSR) [Attachments A - C (separately bound)], boring logs (Attachment D), a summary of detected compounds (Table 1, Table 2, and Table 3), and ground water elevations (Table 4).

DECEMBER 1997

Soil Headspace Sampling and Analysis

On December 8, 1997, O'Brien & Gere collected eight soil samples from the hillside to the south of the former Hidden Valley Electronics building for the purpose of conducting soil headspace screening for volatile organic compounds (VOCs). The samples were generally evenly spaced from east to west across the hillside and were collected from a depth of 0 to 12 inches below grade using a precleaned posthole digger. Upon collection, a portion of the soil sample was placed in a glass jar until the jar was approximately half full. The jar was then covered with aluminum foil and allowed to equilibrate to ambient temperature. The sample was then screened in the field for VOCs using a flame-ionization detector (FID). Based on the field screening activities, no VOCs were detected; therefore, no soil samples were sent to O'Brien & Gere Laboratories, Inc. for analysis.

Sampling equipment was decontaminated between sampling locations using a solution of nonphosphate detergent and distilled water, followed by rinsing with distilled water. Decontamination fluids were allowed to drain onto the ground surface. Excess soil was placed back into sample hole.

JANUARY/FEBRUARY 2001

Soil Boring Advancement and Monitoring Well Installation

On January 31 and February 1, 2001, O'Brien & Gere advanced three soil borings (SB-01, SB-02, and SB-03) to characterize soil and ground water in the vicinity of suspected source areas south of the former Hidden Valley Electronics building. In addition, the soil cuttings from the soil borings were characterized to evaluate subsurface geology. O'Brien & Gere provided oversight for soil boring advancement and monitoring well installation, and contacted the Underground Facilities Protection Organization (UFPO) prior to drilling activities to assess underground utility locations. However, an on-site client representative was responsible for utility clearance of proposed soil boring and monitoring well locations prior to drilling activities.

Initial advancement of the soil borings was attempted using direct-push methods. However, the subsurface conditions precluded the use of direct-push methods and hollow-stem augering was utilized. Subsurface soil samples were collected continuously from the ground surface to the top of bedrock, approximately 38 ft below grade surface at SB-01. The remaining soil borings, SB-02 and SB-03, were advanced to the top of a clay layer that occurred at an approximate depth of 20 ft below grade. The clay layer was encountered in SB-01 at an approximate depth of 26 ft below grade. A portion of each soil sample was collected in a laboratory container and a separate portion was collected in an archive jar for screening purposes. A photoionization detector (PID) was used to screen soil cuttings within the archive jar for the presence of VOCs.

Based on the results of the PID screening and the occurrence of the clay layer, one soil sample from each boring location was submitted to a laboratory for analysis of VOCs using EPA Method 8260. Quality assurance/quality control (QA/QC) samples were collected during the soil boring program. The QA/QC samples collected included a matrix spike, matrix spike duplicate, and trip blank samples. O'Brien & Gere submitted one set of QA/QC samples from the soil boring program for analysis of VOCs using USEPA Method 8260. A Category B deliverable package from the laboratory was used to generate a DUSR. The soil borings were backfilled with a cement/bentonite grout at the completion of drilling activities. Soil cuttings derived from the drilling activities were contained in labeled 55-gal drums and staged on site.

Between drilling locations, the augers and other associated drilling equipment was decontaminated using a high-pressure cleaner. The soil samplers were washed with a nonphosphate detergent solution and rinsed with distilled water between sample intervals. The decontamination fluids were allowed to drain onto the ground surface in the vicinity of the boring locations.

On February 1, 2001, a monitoring well, MW-1 (OBG), was installed in SB-01. This location was selected based on elevated PID screening data with respect to SB-02 and SB-03. The monitoring well materials were assembled and installed through augers. The monitoring well consisted of 2-inch diameter, Schedule 40, PVC materials. A 10-ft section of 0.010-inch slotted screen was flush joined to a section of riser casing. The well screen was positioned from 10 ft to 20 ft below grade. A graded sand filter pack was placed around the well screen from the bottom of the borehole to approximately 2 ft above the top of the well screen. Approximately 2 ft of bentonite was placed on top of the filter pack and hydrated. The remaining annular space between the well casing and the borehole was filled with a cement/bentonite grout. A flush-mount protective cover and locking cap were installed to complete the

monitoring well. On February 2, 2001, the monitoring well was developed to remove the fine-grained material from the well and to improve the hydraulic connection with the aquifer. Approximately 10 gal of ground water was removed from the well during the development activities. During the development, the water did not have a sheen or free-phase product, and was therefore allowed to drain onto the ground surface in the vicinity of the monitoring well.

Monitoring Well MW-1 (OBG) was surveyed to establish the approximate horizontal location and vertical elevation relative to an on-site datum. The established elevation for Monitoring Well MW-1, installed as part of the investigations at the adjacent Miller Sunoco site, was based on base elevations from a Keystone Trozze, LLC survey map dated October 22, 1997. This information was used to prepare a site location map (Figure 1).

Ground Water Sampling and Analysis

On February 5, 2001, O'Brien & Gere collected a ground water sample from MW-1 (OBG) at the site to assess the ground water quality in the vicinity of the former Hidden Valley Electronics building. To provide a representative ground water sample, the monitoring well was purged of three well volumes using a bottom-loading bailer and a length of new polypropylene rope. Upon completion of the second and third well volumes, O'Brien & Gere measured and recorded the pH, specific conductivity, and temperature of the purge water. Verification of the stabilization of well parameter (pH ±0.5, specific conductivity ±5%, and temperature ±5°F) was conducted after the second and third volumes of ground water were purged prior to the sample collection to verify that a representative sample was collected from the formation. Since stabilization of these parameters had not been obtained following the third well volume and the well had not been evacuated to dryness, an additional well volume was evacuated. Stabilization of the purged water was obtained following the fourth well volume. Purged water was discharged to the ground surface since no free product or sheen was observed.

After purging, a ground water sample was collected in an appropriately labeled laboratory container and placed in an ice-filled cooler. The ground water samples were submitted to Upstate Laboratories, Inc. (Upstate) for analysis of VOCs using EPA Method 8260. The QA/QC samples collected included a matrix spike, matrix spike duplicate, and a trip blank. A Category B deliverable data package from the laboratory was used to generate a DUSR.

Septic Tank Sampling

A septic system was identified to be located on the west side of the former Hidden Valley Electronics building. The septic system was considered to be a potential source area for wastewater from previous activities on site, which included the manufacture of printer circuit boards. On February 5, 2001, O'Brien & Gere collected two samples from the septic tank. One sample was collected of the liquid material in the septic tank and one sample was collected of the sludge in the bottom of the septic tank. The samples collected from the septic tank were submitted to Upstate for analysis of VOCs using EPA Method 8260. The QA/QC samples collected included a matrix spike, matrix spike duplicate, and trip blank. A Category B deliverable data package from the laboratory was used to generate a DUSR.

DUSR Preparation

Data Validation Services evaluated the analytical data collected during this sampling event in accordance with the DUSR guidelines. The DUSR provided our assessment of the completeness of the data package as defined under the NYSDEC Analytical Service Protocol Category B deliverables, our evaluation of how the quality control sample results met the analytical protocol required limits and specifications, and a confirmation that the results reported on the data summary sheets were consistent with the raw data. In addition, the DUSR documents the holding time excursions, confirming that the proper established analytical protocols were used to generate the data results, and that the correct data qualifiers were recorded on the data summary sheets. Based on the DUSR prepared by Data Validation Services, the data was determined to be usable as reported.

MAY 2001

Soil Boring Advancement and Monitoring Well Installation

On May 2 and 3, 2001, a total of five additional permanent ground water monitoring wells (TW-1 through TW-5) were installed to characterize soil and ground water in the area of the former Hidden Valley Electronics building, as well as to evaluate the quality of ground water up gradient of the property. O'Brien & Gere provided oversight for the soil boring advancement and monitoring well installation, and contacted the UFPO prior to drilling activities to assess underground utility locations. However, an on-site client representative was responsible for utility clearance of proposed soil boring and monitoring well locations prior to drilling activities.

Initial advancement of the soil borings was conducted using 4.25-inch diameter, hollow-stem augers. Subsurface soil samples were collected continuously from the ground surface to approximately 20 ft below grade at each drilling location. A portion of each soil sample was collected in a laboratory container and a separate portion was collected in an archive jar for screening purposes. A PID was used to screen soil cuttings within the archive jar for the presence of VOCs.

One soil sample exhibiting the highest PID reading from the unsaturated zone within each boring was submitted to a laboratory for analysis of VOCs using EPA Method 8260. QA/QC samples were collected during the soil boring program. The QA/QC samples collected included a matrix spike, matrix spike duplicate, blind duplicate, equipment blank, and trip blank samples. O'Brien & Gere submitted one set of QA/QC samples from the soil boring program for analysis of VOCs using USEPA Method 8260. A Category B deliverable package from the laboratory was used to generate a DUSR. Soil cuttings derived from the drilling activities were contained in 55-gal drums and staged on site.

Monitoring wells were installed within each soil boring. The monitoring well materials were assembled and installed through augers. The monitoring wells consisted of 2-inch diameter, Schedule 40, PVC materials. A 10-ft section of 0.010-inch slotted screen was flush joined to a section of riser casing. A graded sand filter pack was placed around the well screen from the bottom of the borehole to approximately 2 ft above the top of the well screen. Approximately 2 ft of bentonite was placed on top of the filter pack and hydrated. The remaining annular space between the well casing and the borehole was filled with a cement/bentonite grout. Installing a flush-mount protective cover and locking cap completed the monitoring well. The monitoring wells were developed on May 4, 2001 to remove the fine-grained material from the well and to improve the hydraulic connection with the aquifer. During the

development, the water did not have a sheen or free-phase product, and was therefore allowed to drain onto the ground surface in the vicinity of the monitoring well.

Between drilling locations, the augers and other associated drilling equipment was decontaminated using a high-pressure cleaner. The soil samplers were washed with a nonphosphate detergent solution and rinsed with potable water between sample intervals. The decontamination fluids were allowed to drain onto the ground surface in the vicinity of the boring locations and were not contained.

The soil borings and monitoring wells were surveyed to establish the horizontal locations and vertical elevations relative to an on-site datum.

Ground Water Sampling and Analysis

On May 8, 2001, ground water samples were collected from the newly installed monitoring wells (TW-1 through TW-5) and previously installed monitoring wells [MW-1 (OBG), MW-2, MW-3, MW-4, MW-1, and MW-33] to assess the ground water quality in the vicinity of the site. The ground water level in the newly installed monitoring wells was allowed to stabilize for approximately 1 week prior to conducting the ground water sampling activities. O'Brien & Gere then measured the depth to water in the newly installed monitoring wells and the previously installed monitoring wells using an electronic water level probe. The depth to water measurement was converted to ground water elevations and used to assess ground water flow conditions. The ground water flow direction at the time of the ground water elevation measurements was generally to the northwest (ground water elevations are presented in Table 4).

To provide representative ground water samples, the monitoring wells were purged of three well volumes or until evacuated to dryness using a bottom-loading bailer and a length of new polypropylene rope. Upon completion of the purging of the second and third well volumes, O'Brien & Gere measured and recorded the pH, specific conductivity, and temperature of the purge water. Verification of the stabilization of well parameters (pH ±0.5, specific conductivity ±5%, and temperature ±5°F) was conducted after the second and third volumes of ground water were purged prior to the sample collection. If stabilization of these parameters had not been obtained and the well had not been evacuated to dryness, additional well volumes were evacuated until the purge water has stabilized to verify that a representative sample was collected from the formation. Purge water was discharged to the ground surface since no sheen or free product was observed.

After purging, ground water samples were collected from the monitoring wells using bottom-loading bailers. The ground water samples were collected in appropriately labeled laboratory containers and placed in an ice-filled cooler. QA/QC samples consisted of a matrix spike, matrix spike duplicate, blind duplicate, and trip blank. The ground water and QA/QC samples were submitted to Upstate for analysis of VOCs using EPA Method 8260. A Category B deliverable data package from the laboratory was used to generate a DUSR.

DUSR Preparation

O'Brien & Gere evaluated the analytical data collected during this sampling event, as described above. Based on the DUSR prepared by O'Brien & Gere, the data was determined to be usable as reported.

OCTOBER 2001

Soil Boring Advancement and Monitoring Well Installation

On October 17 and 18, 2001, a total of four additional permanent ground water monitoring wells (TW-6 through TW-9) were installed to characterize soil and ground water in the parking area east of the former Hidden Valley Electronics building, as well as to evaluate the quality of ground water flowing from areas up gradient of the property. Soil boring advancement, monitoring well installation, and ground water sampling and analysis were conducted as described above in the May 2001 activities. The four monitoring wells were developed on October 19, 2001 and ground water sampling was conducted on October 29, 2001. In addition O'Brien & Gere completed the DUSR preparation for this sampling event, as described above. Based on the DUSR prepared by O'Brien & Gere, the data was determined to be usable as reported.

SOIL ANALYTICAL RESULTS

Soil analytical results for the samples collected during the investigations described above are included in Attachments A-C. A summary of the detected VOCs for the soil samples collected during the investigations are included in Table 1.

As identified in Table 1, VOCs were not detected above the New York State TAGM #4046 Recommended Soil Cleanup Objective concentrations in the soil samples. Based on the analytical results, VOC concentrations in subsurface soil samples collected on site are not indicative of source material, but rather residual contamination.

GROUND WATER ANALYTICAL RESULTS

Ground water analytical results for samples collected during the investigations described above are included in Attachments A-C. A summary of the detected VOCs for the ground water samples collected during the investigations is included in Table 2.

As identified in Table 2, the analytical results indicate that certain VOCs were detected in MW-1, MW-3, MW-33, TW-1, TW-2, TW-3, TW-4, TW-5, and TW-6 at concentrations above the New York State Class "GA" Ambient Ground Water Standards. According to the analytical results, the highest VOC concentrations were identified in monitoring wells located to the east and north of the building. Based on the analytical results, contaminant concentrations indicate that the ground water on site has been impacted.

If you have any questions concerning this potential source area investigation, please do not hesitate to call Mr. Scott Youngs at (607) 770-0908, Ext. 23 or Mr. Douglas Crawford at (315) 437-6100, Ext. 2442.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Douglas A. Warneck, P.E.
Vice President

SRY/sry

Attachments

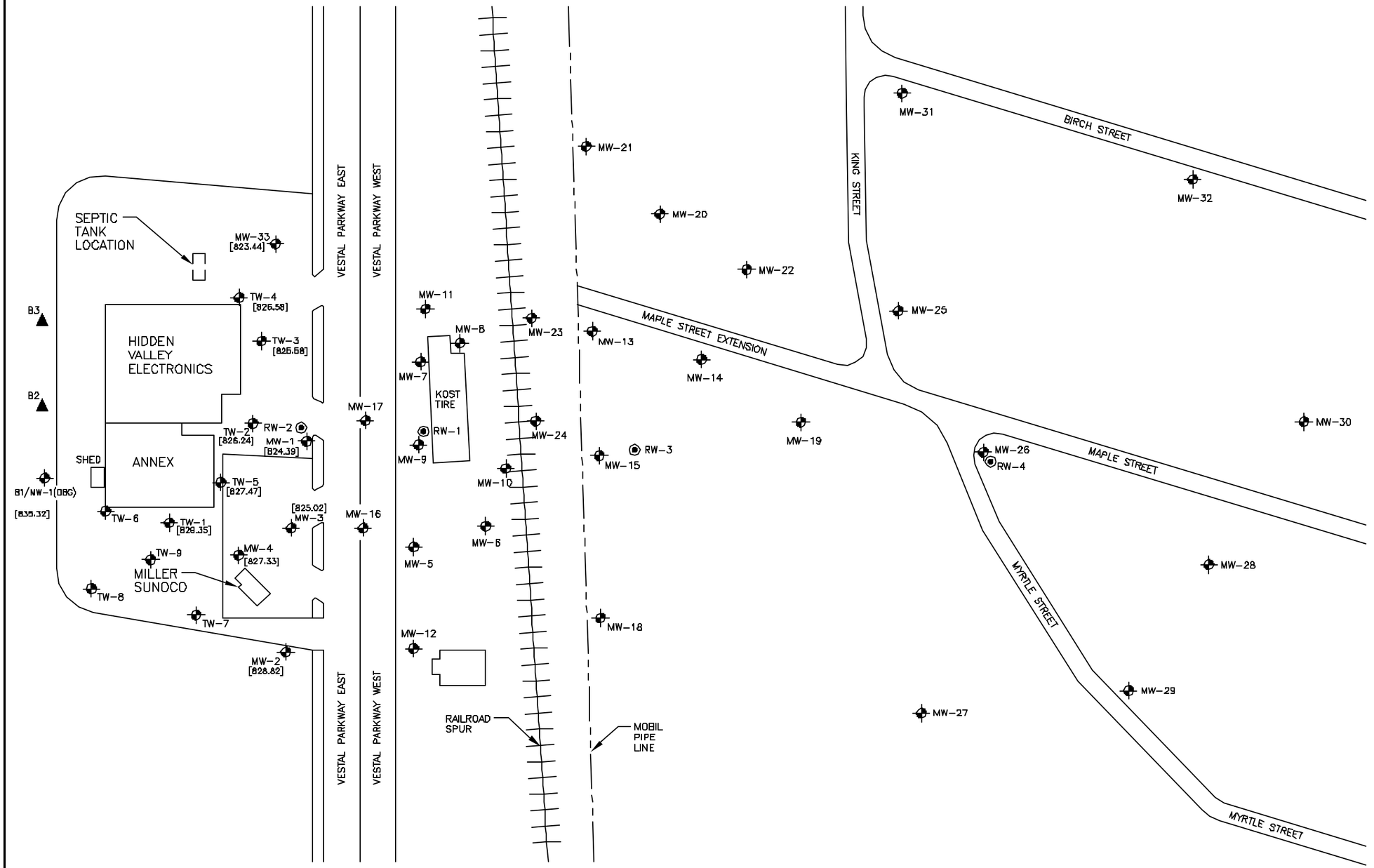
cc: Mr. Gregory Gates, Esq. – Hickey, Sheehan & Gates, P.C.
Mr. David Carnevale – O'Brien & Gere Engineers, Inc.
Mr. Douglas Crawford, P.E. – O'Brien & Gere Engineers, Inc.
Mr. Scott Youngs – O'Brien & Gere Engineers, Inc.

FIGURE 1

Site Map

DWG PATH: I:\VESTAL\PROJECTS\6755\25607\003.DWG 1-120

FIGURE 1



LEGEND

- MONITORING WELL
- SOIL BORING
- RECOVERY WELL
- [823.44] GROUND WATER ELEVATION

CG PROPERTIES, LLC

SITE MAP

FILE NO. 6755.25607.003
FEBRUARY 2002

O'BRIEN & GERE ENGINEERS INC.

PLOT DATE: 12/27/01 MTW

TABLE 1

Soil Analytical Results Summary

TABLE 1

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Summary of Detected Parameters - Soil

ID	Parameters Detected	TAGM # 4046 Rec. Soil Cleanup Objective (ug/kg)	Analytical Results (ug/kg) 2/1/01	2/5/01	5/2/01	10/17-18/01
B1 (14'-16')						
	Methylene Chloride	100	39 J	NS	NS	NS
	Benzene	60	14 J	NS	NS	NS
B2 (16'-18')						
	Methylene Chloride	100	11 JB	NS	NS	NS
B2 (18'-20')						
	Methylene Chloride	100	9 JB	NS	NS	NS
B3 (18'-20')						
	Methylene Chloride	100	9 JB	NS	NS	NS
Septic Sludge						
	Acetone	200	NS	160	NS	NS
	Methylene Chloride	100	NS	17 B	NS	NS
TW-1 (12'-14')						
	Acetone	200	NI	NI	18	NS
	1,1,1-Trichloroethane	800	NI	NI	7 J	NS
	Trichloroethene	700	NI	NI	120	NS
TW-2 (14-16')						
	Acetone	200	NI	NI	19	NS
	Trichloroethene	700	NI	NI	23	NS
TW-3 (12'-14')						
	Acetone	200	NI	NI	19	NS
	Trichloroethene	700	NI	NI	3 J	NS
TW-4 (12'-14')						
	Acetone	200	NI	NI	15	NS

TABLE 1

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Summary of Detected Parameters - Soil

ID	Parameters Detected	TAGM # 4046 Rec. Soil Cleanup Objective (ug/kg)	Analytical Results (ug/kg) 2/1/01	2/5/01	5/2/01	10/17-18/01
TW-5 (12'-14')						
	Acetone	200	NI	NI	17	NS
	Trichloroethene	700	NI	NI	40	NS
TW-6 (8'-10')						
	Trichloroethene	700	NI	NI	NI	12
	Toluene	1500	NI	NI	NI	2 J
	Tetrachloroethene	1400	NI	NI	NI	2 J
	m,p-Xylene	1200	NI	NI	NI	2 J
TW-7 (6'-8')						
	Methylene Chloride	100	NI	NI	NI	1 J
TW-8 (6'-8')						
	Methylene Chloride	100	NI	NI	NI	2 J
TW-9 (6'-8')						
	Methylene Chloride	100	NI	NI	NI	3 JB
	Trichloroethene	700	NI	NI	NI	3 J

Notes:

NS - Not sampled
NI - At this date the well had not been installed
J - Indicates an estimated value
B - This flag is used when the analyte is found in the associated blank, as well as in the sample.

TABLE 2

Ground Water Analytical Results Summary

TABLE 2

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Summary of Detected Parameters - Water

ID	Parameters Detected	New York State Class "GA" Ambient Water Quality Standard (ug/L)	Analytical Results (ug/L) 2/5/01	5/8/01	10/29/01
MW-1					
	1,1-Dichloroethene	5	NS	7 J	NS
	1,1,1-Trichloroethane	5	NS	100	NS
	Trichloroethene	5	NS	150	NS
MW-2					
	NONE		NS	ND	NS
MW-3					
	Benzene	1	NS	66	NS
	Toluene	5	NS	82	NS
	Ethylbenzene	5	NS	150	NS
	Xylenes	5	NS	353	NS
MW-4					
	1,1,1-Trichloroethane	5	NS	4 J	NS
	Trichloroethene	5	NS	5 J	NS
MW-33					
	1,1,1-Trichloroethane	5	NS	15	NS
	Trichloroethene	5	NS	2 J	NS
MW-1 (OBG)					
	NONE		ND	ND	NS
TW-1					
	Tetrachloroethene	5	NI	2 J	NS
	1,1-Dichloroethene	5	NI	15	NS
	1,1,1-Trichloroethane	5	NI	470	NS
	Trichloroethene	5	NI	780	NS
TW-2					
	1,1-Dichloroethene	5	NI	47	NS

TABLE 2

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Summary of Detected Parameters - Water

ID	Parameters Detected	New York State Class "GA" Ambient Water Quality Standard (ug/L)	Analytical Results (ug/L) 2/5/01	5/8/01	10/29/01
	1,1-Dichloroethane	5	NI	9 J	NS
	1,1,1-Trichloroethane	5	NI	130	NS
	Trichloroethene	5	NI	150	NS
TW-3					
	1,1-Dichloroethene	5	NI	3 J	NS
	1,1-Dichloroethane	5	NI	2 J	NS
	1,1,1-Trichloroethane	5	NI	28	NS
	Trichloroethene	5	NI	8 J	NS
TW-4					
	1,1,1-Trichloroethane	5	NI	13	NS
	Trichloroethene	5	NI	4 J	NS
TW-5					
	Chloroform	7	NI	1 J	NS
	1,1-Dichloroethane	5	NI	4 J	NS
	1,1-Dichloroethene	5	NI	36	NS
	1,1,1-Trichloroethane	5	NI	170	NS
	Trichloroethene	5	NI	280	NS
TW-6					
	1,1-Dichloroethene	5	NI	NI	3 J
	1,1,1-Trichloroethane	5	NI	NI	99
	Trichloroethene	5	NI	NI	100

TABLE 2

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Summary of Detected Parameters - Water

ID	Parameters Detected	New York State Class "GA" Ambient Water Quality Standard (ug/L)	Analytical Results (ug/L) 2/5/01	5/8/01	10/29/01
TW-7					
	NONE		NI	NI	ND
TW-8					
	NONE		NI	NI	ND
TW-9					
	NONE		NI	NI	ND

Notes:

NS - Not sampled
ND - Not detected
NI - At this date the well had not been installed
J - Indicates an estimated value

6755/25607/4_n&d/cgprop_gwdata.xls

TABLE 3

Septic Tank Analytical Results Summary

TABLE 3

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Summary of Detected Parameters - Septic Tank

ID	Parameters Detected	Analytical Results (ug/kg) 2/5/01
Septic Sludge		
	Acetone	160
	Methylene Chloride	17 B
Septic Water		
	NONE	ND

Notes:

ND - Not detected
B - This flag is used when the analyte is found in the associated blank ,as well as in the sample.

6755/27506/4_n&d/cgprop_septictankdata.xls

TABLE 4

Ground Water Elevations

TABLE 4

FORMER HIDDEN VALLEY ELECTRONICS SITE
Vestal, New York

Ground Water Elevations

Well ID	Date	Well Measured depth (ft)	Casing Elev. (ft)[a]	Depth to Water (ft)[b]	Ground Water Elev. (ft)
MW-1	5/8/01	18.42	836.37	11.98	824.39
MW-2	5/8/01	17.76	838.02	9.20	828.82
MW-3	5/8/01	17.96	837.12	12.10	825.02
MW-4	5/8/01	17.71	838.48	11.15	827.33
MW-33	5/8/01	19.16	834.88	11.44	823.44
MW-1 (OBG)	2/5/01	20.05	837.50	4.46	833.04
	5/8/01	19.77	837.50	2.18	835.32
TW-1	5/8/01	19.11	838.21	8.86	829.35
TW-2	5/8/01	19.21	838.12	11.88	826.24
TW-3	5/8/01	19.61	838.06	12.48	825.58
TW-4	5/8/01	19.71	838.08	11.50	826.58
TW-5	5/8/01	19.80	838.46	10.58	827.88

Notes: [a]Base elevation taken from Keystone Trozze, LLC survey map dated October 22, 1997.
[b]Measured from the top of the PVC casing.

6755/25607/4_n&d/cgprop_gwelev.xls

ATTACHMENT A

January/February 2001
Analytical Results and DUSR

(Separately Bound)

ATTACHMENT B

May 2001
Analytical Results and DUSR

(Separately Bound)

ATTACHMENT C

October 2001
Analytical Results and DUSR

(Separately Bound)

ATTACHMENT D

Boring Logs

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING SB-01 / MW-1 (OBG)
Client: C.G Properties	**Sampler:** 2' split-spoon	**Page 1 of** 2
Proj. Loc: Vestal , NY	**Hammer:**	**Location:**
File No.: 25607	**Fall:**	**Start Date:** 1/31/01 **End Date:** 1/31/01
Boring Company: Parratt-Wolff Inc. **Foreman:** Doug Richmond **OBG Geologist:** Eddy Teasdale		**Screen** = \ **Riser** **Grout** **Sand Pack** **Bentonite**

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0	1	0-2	N/A	24/15	N/A	Brown, damp, medium dense, fine SAND with some silt and sub angular coarse gravel			15
2	2	2-4	N/A	24/9	N/A	Same as Previous			17
4	3	4-6	N/A	24/17	N/A	Brown, damp, medium dense SILT and fine SAND, trace sub-angular gravel			30
6	4	6-8	N/A	24/24	N/A	Same as Previous, moist			30
8	5	8-10	N/A	24/24	N/A	Same as Previous, at 9' grades into a brown, dry, very dense SILT with some sand			23
10	6	10-12	N/A	24/12	N/A	Brown, dry, very dense SILT some fine sand and gravel			300
12	7	12-14	N/A	24/24	N/A	Brown, saturated, dense, SILT and fine SAND with some coarse gravel			800
14	8	14-16	N/A	24/24	N/A	Brown, saturated, medium dense SILT and fine SAND with some coarse gravel			800
16	9	16-18	N/A	24/12	N/A	Brown, damp, medium dense SILT and fine SAND with some coarse gravel			200
18	10	18-20	N/A	24/6	N/A	Same as Previous, grades into a brown, dry, very dense SILT with some sand and gravel			1.5
20	11	20-22	N/A	24/12.5	N/A	Brown, damp, dense SILT and fine Gravel with some coarse sand			5.6
22	12	22-24	N/A	24/6	N/A	Brown, damp, dense Silt and fine gravel with some fine sand.			10
24	13	24-26	N/A	24/8	N/A	Same as Previous, grades into damp a dense CLAY and SILT Layer at approx. 26'			20

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING SB-01 / MW-1 (OBG)
Client: C.G Properties	**Sampler:** 2' split-spoon	**Page 2 of 2**
Proj. Loc: Vestal , NY	**Hammer:**	**Location:**
File No.: 25607	**Fall:**	**Start Date:** 1/31/01 **End Date:** 1/31/01
Boring Company: Parratt-Wolff Inc. **Foreman:** Doug Richmond **OBG Geologist:** Eddy Teasdale		**Screen** = \ **Grout** **Riser** **Sand Pack** **Bentonite**

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
26	14	26-28	N/A	24/15	N/A	Brown, damp, very dense Silt with some clay little gravel coarse gravel			20
28	15	28-30	N/A	24/8	N/A	Dark Brown, damp, medium dense fine-coarse Sand with some silt			4.2
30	16	30-32	N/A	24/18	N/A	Same as Previous			5
32	17	32-34	N/A	24/17	N/A	Same as Previous			3.7
34	18	34-36	N/A	24/24	N/A	Dark Brown, damp, medium dense Sand and Silt			3.4
36	19	36-38	N/A	24/8	N/A	Dark Brown, damp, medium dense fine-coarse Sand with some silt			3.7
38	20	38-40	N/A	24/18	N/A	Grey bedrock encountered			5.3
						Notes:			
						Bottom of Boring at 40' Water encountered at 13'			

Hydrated bentonite pellets from 20.5 ft to 40 ft
2-in dia. 0.010-in slot PVC screen from 10 ft to 20 ft
Sandpack from 8 ft to 20.5 ft
Bentonite pellet seal from 6 ft to 8 ft
Cement/bentonite grout from 0.5 ft to 6 ft; flush-mount well cover installed in concrete pad

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING SB-02
Client: C.G Properties	Sampler: 2' split-spoon	Page 1 of 1
Proj. Loc: Vestal , NY	Hammer:	Location:
File No.: 25607	Fall:	Start Date: 2/1/01 End Date: 2/1/01
Boring Company: Parratt-Wolff Inc. Foreman: Doug Richmond OBG Geologist: Eddy Teasdale		Screen = \ Grout Riser Sand Pack Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0	1	0-2	N/A	24/11	N/A	Brown, wet, medium dense fine SAND with some silt and sub angular coarse gravel (fill material)			3.5
2	2	2-4	N/A	24/16	N/A	Same as Previous			17.1
4	3	4-6	N/A	24/8	N/A	Brown, damp, medium dense SILT and sub-angular Gravel some fine sand			7
6	4	6-8	N/A	24/24	N/A	Same as Previous, wet	WATER		7
8	5	8-10	N/A	24/24	N/A	Brown, wet, medium dense fine SAND with some silt and sub angular coarse gravel			2.9
10	6	10-12	N/A	24/10	N/A	Same as Previous, grades into a Dark Brown, dry, very dense Sand and SILT			2.4
12	7	12-14	N/A	24/24	N/A	Grades back into a Brown, wet SILT and SAND with some fine gravel			3
14	8	14-16	N/A	24/24	N/A	Dark Brown, damp, medium dense SAND some silt, trace gravel			4
16	9	16-18	N/A	24/10	N/A	Same as Previous			1
18	10	18-20	N/A	24/24	N/A	Same as Previous, grades into a brown, dry, very dense SILT with some sand and gravel			1
						Notes:			
						Bottom of Boring at 20'			
						Water encountered at 6'			

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING
SB-03

Client: C.G Properties
Proj. Loc: Vestal , NY
File No.: 25607

Sampler: 2' split-spoon
Hammer:
Fall:

Page 1 of 1
Location:
Start Date: 2/1/01
End Date: 2/1/01

Boring Company: Parratt-Wolff Inc.
Foreman: Doug Richmond
OBG Geologist: Eddy Teasdale

Screen = | **Riser** | Grout | Sand Pack | Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0	1	0-2	N/A	24/6	N/A	Brown, wet, medium dense fine SAND with some silt and sub-angular coarse gravel (fill material)			N/A
2	2	2-4	N/A	24/0	N/A	Refusal, no sample			N/A
4	3	4-6	N/A	24/10	N/A	Brown,wet, loose coarse SAND and SILT some sub-angular Gravel			0
6	4	6-8	N/A	24/24	N/A	Same as Previous, wet	WATER		0
8	5	8-10	N/A	24/24	N/A	Brown, wet, medium dense fine SAND with some silt and sub angular coarse gravel , at 9.8' grades into a moist, dense SILT and Gravel			0
10	6	10-12	N/A	24/24	N/A	Same as Previous, grades into a Dark Brown, dry, very dense Sand and SILT			0
12	7	12-14	N/A	24/6	N/A	Grades back into a Brown, wet, SILT and SAND with some fine gravel			0
14	8	14-16	N/A	24/24	N/A	Same as Previous, at 15' grades into a brown damp coarse sand with some silt and gravel			0
16	9	16-18	N/A	24/12	N/A	Dark Brown, damp, dense coarse SAND with some silt and gravel			0
18	10	18-20	N/A	24/12	N/A	Dark Brown, damp, dense coarse SAND and SILt with some gravel, grades into a very dense SILT with some sand			0

Notes:

Bottom of Boring at 20'
Water encountered at 6'

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-1
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: Direct push Sampler: 2 inch split spoon Hammer: Hydraulic Fall: NA	Page 1 of 1 Location: Start Date: 05/03/01 End Date: 05/03/01
Boring Company: Parratt-Wolff, Inc. Foreman: Layne Pech Drill Rig: OBG Geologist: Dave Carnevale		Screen = Riser Steel //

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0.1	1	2	NA	2.0/1.5	NA	0 - 0.1 ft Asphalt to Dark yellowish brown 10YR 4/2, damp, SILT, little medium gravel			0.9	
2	2	4	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, damp, fine SAND, SILT and fine to medium GRAVEL			1.8	
4	3	6	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, damp, extremely dense, SILT, some fine gravel			1.8	
6	4	8	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, damp, extremely dense, SILT, some fine gravel			2.5	
8	5	10	NA	2.0/1.5	NA	Dark yellowish brown 10YR 4/2, saturated, fine to medium SAND and SILT, some fine gravel (angular), little medium to coarse gravel (subangular)			3.9	
10	6	12	NA	2.0/1.5	NA	Dusky yellowish brown 10YR 2/2, saturated, clayey fine SAND			3.7	
12	7	14	NA	2.0/2.0	NA	Dusky yellowish brown 10YR 2/2, saturated, clayey fine SAND			4.1	
14	8	16	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, dense, SILT and fine SAND, trace clay			3.2	
16	9	18	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, dense, SILT and fine SAND, trace clay			3.6	
18	10	20	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, fine SAND and fine GRAVEL, little silt			3.5	

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 4.0 ft; cement/bentonite grout: 4.0 - 2.0 ft; sand drain: 2.0 - 0.5 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-2
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: Direct push Sampler: 2 inch split spoon Hammer: Hydraulic Fall: NA	Page 1 of 1 Location: Start Date: 05/02/01 End Date: 05/02/01
Boring Company: Parratt-Wolff, Inc. Foreman: Layne Pech Drill Rig: OBG Geologist: Dave Carnevale		Screen = Grout Riser Sand Pack Steel // Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	NA	2.0/1.5	NA	Dark yellowish brown 10YR 4/2, damp, fine SAND and SILT, little fine gravel			0.0	
2	2	4	NA	2.0/0.7	NA	Dark yellowish brown 10YR 4/2, damp, fine SAND and SILT, little fine gravel			0.0	
4	3	6	NA	2.0/1.8	NA	Dark yellowish brown 10YR 4/2, moist, fine SAND			0.0	
6	4	8	NA	2.0/1.5	NA	Dark yellowish brown 10YR 4/2, moist, fine SAND, little fine to medium gravel, little silt			0.2	
8	5	10	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, moist, fine SAND, little medium gravel and silt			0.8	
10	6	12	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, moist, fine SAND, little medium gravel and silt, little coarse gravel, large rock in tip of spoon			0.6	
12	7	14	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, fine SAND and SILT			0.4	
14	8	16	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, SILT, little fine sand			7.4	
16	9	18	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, SILT, little fine sand			6.0	
18	10	20	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, SILT, little fine sand to 19 ft, then damp, SILT matrix till with fine gravel (angular)			4.0	

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 4.0 ft; cement/bentonite grout: 4.0 - 2.0 ft; sand drain: 2.0 - 0.5 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-3
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: Direct push Sampler: 2 inch split spoon Hammer: Hydraulic Fall: NA	Page 1 of 1 Location: Start Date: 05/02/01 End Date: 05/02/01
Boring Company: Parratt-Wolff, Inc. Foreman: Layne Pech Drill Rig: OBG Geologist: Dave Carnevale		Screen = \ Grout Riser Sand Pack Steel // Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	NA	1.5/1.0	NA	Asphalt 0 - 0.5 ft below grade then Dark yellowish brown 10YR 4/2, moist, SILT and fine SAND, rock in spoon tip			---	
2	2	4	NA	NA	NA	Large rock in bottom of auger hole. Auger to 4 ft and continue sampling.			---	
4	3	6	NA	NA	NA	Large COBBLES to 6 ft			---	
6	4	8	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, damp, dense, fine SAND and SILT, some fine to medium gravel (angular)			0.0	
8	5	10	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, moist, fine SAND and SILT, some fine to medium gravel (saturated in spoon tip)			0.4	
10	6	12	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, fine SAND and SILT, some fine to medium gravel			0.3	
12	7	14	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, fine SAND and SILT, some fine to medium gravel			0.4	
14	8	16	NA	2.0/0.0	NA	Spoon refusal			---	
16	9	18	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, moist to saturated, SILT, little fine sand and fine gravel (subangular) (till - like)			0.0	
18	10	20	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, moist to saturated, SILT, little fine sand and fine gravel (subangular) (till - like)			0.0	

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 3.5 ft; cement/bentonite grout: 3.5 - 2.0 ft; sand drain: 2.0 - 1.0 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-4
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: Direct push Sampler: 2 inch split spoon Hammer: Hydraulic Fall: NA	Page 1 of 1 Location: Start Date: 05/02/01 End Date: 05/03/01
Boring Company: Parratt-Wolff, Inc. Foreman: Layne Pech Drill Rig: OBG Geologist: Dave Carnevale		Screen = Grout Riser Sand Pack Steel // Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	NA	1.5/1.5	NA	Asphalt 0 - 0.5 ft then encountered vault type structure from 2 - 6 ft			---	
2	---	4	NA	NA	NA				---	
4	2	6	NA	2.0/1.5	NA	Moderate yellowish brown 10YR 5/4, moist, SILT, little fine sand and fine gravel			0.0	
6	3	8	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, moist dense, SILT, little fine sand, some fine to medium gravel (rounded)			0.0	
8	4	10	NA	2.0/2.0	NA	Pale reddish brown 10YR 5/4, moist, SILT, some fine to medium sand, and gravel (subrounded), trace clay saturated at approx 9.8 ft			0.0	
10	5	12	NA	2.0/1.0	NA	Pale reddish brown 10YR 5/4, saturated, SILT, some fine to medium sand, and gravel (subrounded), trace clay			---	
12	6	14	NA	2.0/1.5	NA	Pale reddish brown 10YR 5/4, saturated, SILT, some fine to medium sand, and gravel (subrounded), trace clay			0.0	
14	7	16	NA	1.0/0.1	NA	Poor recovery			---	
16	8	18	NA	0.5/0.1	NA	Poor recovery			---	

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 4.0 ft; cement/bentonite grout: 4.0 - 2.0 ft; sand drain: 2.0 - 1.0 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-5
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: Direct push Sampler: 2 inch split spoon Hammer: Hydraulic Fall: NA	Page 1 of 1 Location: Start Date: 05/03/01 End Date: 05/03/01
Boring Company: Parratt-Wolff, Inc. Foreman: Layne Pech Drill Rig: OBG Geologist: Dave Carnevale		Screen = Riser Steel // \ Grout Sand Pack Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	NA	2.0/2.0	NA	Moderate yellowish brown 10YR 5/4, damp, SILT			0.5	
2	2	4	NA	2.0/2.0	NA	Moderate yellowish brown 10YR 5/4, damp, SILT			1.5	
4	3	6	NA	2.0/2.0	NA	Moderate yellowish brown 10YR 5/4, damp, SILT, little very fine sand			3.3	
6	4	8	NA	2.0/2.0	NA	Moderate yellowish brown 10YR 5/4, damp, SILT, little very fine sand, some fine to medium gravel from 7.8-8.0 ft			2.6	
8	5	10	NA	2.0/1.0	NA	Dark yellowish brown 10YR 4/2, damp, SILT, some fine sand and fine to medium gravel (subangular)			2.6	
10	6	12	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, fine to medium SAND and SILT, some fine to coarse gravel (angular), trace clay			2.5	
12	7	14	NA	2.0/2.0	NA	Dark yellowish brown 10YR 4/2, saturated, fine to medium SAND and SILT, some fine to coarse gravel (angular), trace clay			4.1	
14	8	16	NA	2.0/1.0	NA	Moderate yellowish brown 10YR 5/4, saturated, fine to medium gravel (subrounded), some silt, little fine to medium sand, very loose			2.2	
16	9	18	NA	2.0/1.0	NA	Moderate yellowish brown 10YR 5/4, saturated, fine to medium gravel (subrounded), some silt, little fine to medium sand, very loose			2.4	
18	10	20	NA	2.0/1.0	NA	Moderate yellowish brown 10YR 5/4, saturated, fine to medium gravel (subrounded), some silt, little fine to medium sand, very loose			1.2	

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 4.0 ft; cement/bentonite grout: 4.0 - 2.0 ft; sand drain: 2.0 - 1.0 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-6
Client: CG Properties, LLC	Drill Method: 4.25" H. S. A. Sampler: 2 inch split spoon Hammer: 140 lb	Page 1 of 1 Location:
Proj. Loc: Vestal, NY File No.: 25607	Fall: 30 inches	Start Date: 10/17/01 End Date: 10/17/01
Boring Company: Parratt-Wolff, Inc. Foreman: Jim Lansing Drill Rig: CME OBG Geologist: Chawn O'Dell		Screen = Riser Steel //

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	-4	1.5/1.0	8	Asphalt from 0 - 0.03 ft below grade				
			4-6			Then brownish gray 5YR 4/1, damp, loose, fine to medium SAND, little fine gravel (angular)			0.1	neg
2	2	4	6-8	2.0/1.0	17	Brownish gray 5YR 4/1, damp, medium dense, fine to coarse SAND, little fine gravel (angular)			0.3	neg
			9-8							
4	3	6	10-11	2.0/0.5	24	Brownish gray 5YR 4/1, damp, medium dense, fine to coarse SAND, little medium to fine gravel (angular)			1.1	neg
			13-14							
6	4	8	12-12	2.0/0.8	24	Brownish gray 5YR 4/1, damp, medium dense, fine to coarse SAND, little fine to coarse gravel (angular)			1.6	neg
			12-9							
8	5	10	6-9	2.0/1.6	18	Olive gray 5Y 4/1, damp to saturated at approx. 9.8 ft, medium dense, fine to medium SAND, little coarse sand to fine gravel (subangular to angular)			1.8	neg
			9-11							
10	6	12	6-7	2.0/0.5	16	Brownish gray 5YR 4/1, saturated, fine to medium SAND, little coarse sand to medium gravel (angular)			0.6	neg
			9-7							
12	7	14	6-6	2.0/1.7	13	Brownish gray 5YR 4/1, saturated, fine to medium SAND, little coarse sand to medium gravel (angular)			0.3	neg
			7-7							
14	8	16	6-7	2.0/1.0	14	Brownish gray 5YR 4/1, saturated, dense, SILT and fine SAND, little fine to coarse gravel (angular)			0.2	neg
			7-18							
16	9	18	41-37	2.0/1.6	65	Brownish gray 5YR 4/1, saturated, very dense, coarse SAND and fine GRAVEL (subangular), little medium to coarse gravel, trace fine to medium sand			0.3	neg
			28-							
			60/0.4							
18	10	19	29-52	1.0/0.9	100+	Brownish gray 5YR 4/1, saturated, extremely dense, coarse SAND and fine GRAVEL (subangular), little medium to coarse gravel, trace fine to medium sand			0.1	neg

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 19.0 - 9.0 ft; sand pack: 19.0 - 7.0 ft; bentonite seal: 7.0 - 5.0 ft; cement/bentonite grout: 5.0 - 1.0 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-7
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: 4.25" H. S. A. Sampler: 2 inch split spoon Hammer: 140 lb Fall: 30 inches	Page 1 of 1 Location: Start Date: 10/17/01 End Date: 10/17/01
Boring Company: Parratt-Wolff, Inc. Foreman: Jim Lansing Drill Rig: CME OBG Geologist: Chawn O'Dell		Screen = \ Grout Riser Sand Pack Steel // Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	-9	1.5/1.5	16	Asphalt from 0 - 0.5 ft below grade				
			7-6			Then dark yellowish brown 10YR 4/2, damp, fine SAND, little fine gravel (angular)			0.0	neg
2	2	4	6-7	2.0/1.6	14	Dark yellowish brown 10YR 4/2, damp, fine SAND, trace fine to coarse gravel (angular)			0.0	neg
			7-9							
4	3	6	7-11	2.0/1.0	18	Brownish gray 5YR 4/1, damp, medium dense, fine to medium SAND, little coarse sand to fine gravel (angular)			0.0	neg
			7-9							
6	4	8	7-5	2.0/0.7	12	Brownish gray 5YR 4/1, damp, medium dense, fine to coarse SAND, little coarse to fine gravel (angular)			0.0	neg
			7-21							
8	5	10	9-8	2.0/1.2	17	Brownish gray 5YR 4/1, saturated, medium dense, coarse to fine SAND, little fine to coarse gravel (subrounded to subangular)			0.0	neg
			11-4							
10	6	12	3-5	2.0/1.3	11	Olive gray 5Y 4/1, saturated, medium dense, coarse to fine SAND, some fine to medium gravel (subrounded to subangular)			0.0	neg
			6-6							
12	7	14	5-4	2.0/10.5	8	Olive gray 5Y 4/1, saturated, loose, coarse SAND and fine GRAVEL (subrounded to subangular), little medium to coarse gravel, little fine to medium sand			0.0	neg
			4-4							
14	8	16	6-8	2.0/2.0	16	Olive gray 5Y 4/1, saturated, medium dense, coarse SAND and fine GRAVEL (angular), little medium to coarse gravel (angular), little medium to fine sand			0.0	neg
			8-11							
16	9	18	9-11	2.0/1.7	26	Olive gray 5Y 4/1, saturated, medium dense, coarse SAND and fine GRAVEL (angular), little medium to coarse gravel (angular), little medium to fine sand			0.0	neg
			15-21							
18	10	20	13-13	2.0/2.0	29	Olive gray 5Y 4/1, saturated, medium dense, coarse SAND and fine GRAVEL (angular), little medium to coarse gravel (angular), little medium to fine sand			0.0	neg
			16-39							

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 6.0 ft; cement/bentonite grout: 6.0 - 1.0 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-8
Client: CG Properties, LLC Proj. Loc: Vestal, NY File No.: 25607	Drill Method: 4.25" H. S. A. Sampler: 2 inch split spoon Hammer: 140 lb Fall: 30 inches	Page 1 of 1 Location: Start Date: 10/17/01 End Date: 10/18/01
Boring Company: Parratt-Wolff, Inc. Foreman: Jim Lansing Drill Rig: CME OBG Geologist: Chawn O'Dell		Screen = Riser Steel //

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	6-6	2.0/1.0	27	Brownish gray 5YR 4/1, damp, fine to coarse GRAVEL (angular), some fine to medium sand, little coarse sand			0.0	neg
			21-19							
2	2	4	14-17	2.0/1.2	28	Brownish gray 5YR 4/1, damp, medium dense, fine to medium SAND, some fine to coarse gravel (angular), little coarse sand			0.0	neg
			11-7							
4	3	6	6-11	2.0/0.2	22	Brownish gray 5YR 4/1, damp, medium dense, coarse GRAVEL (angular) lodged in the split spoon tip			0.0	neg
			11-13							
6	4	8	12-15	2.0/1.2	36	Brownish gray 5YR 4/1, damp, dense, fine SAND, some fine to medium gravel (angular), little medium to coarse sand			0.0	neg
			21-16							
8	5	10	10-22	2.0/1.8	37	Olive gray 5Y 4/1, damp to saturated, dense, fine to medium SAND, some fine to coarse gravel (angular)			0.0	neg
			15-18							
10	6	12	9-11	2.0/2.0	28	Dark yellowish brown 10 YR 4/2, saturated, medium dense, fine SAND, some fine to coarse gravel (subangular), little medium to coarse sand			0.0	neg
			17-32							
12	7	14	100/0.4	0.4/0.4	100+	Dark yellowish brown 10 YR 4/2, saturated, extremely dense, fine SAND, some fine to coarse gravel (subangular), little medium to coarse sand			0.0	neg
14	8	16	16-21	2.0/1.9	48	Olive gray 5Y 4/1, saturated, dense, fine SAND, some fine to medium gravel (angular)			0.0	neg
			27-14							
16	9	17	31-46	1.0/1.0	77+	Olive gray 5Y 4/1, saturated, very dense, fine SAND, some fine to medium gravel (angular)			0.0	neg
18	10	20	21-39	2.0/2.0	84	Olive gray 5Y 4/1, saturated, extremely dense, fine SAND, some fine to medium gravel (angular), little coarse gravel, trace medium to coarse sand			0.0	neg
			45-51							

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 6.0 ft; cement/bentonite grout: 6.0 - 1.0 ft
The well was completed as a flush mount.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING TW-9
Client: CG Properties, LLC	Drill Method: 4.25" H. S. A. Sampler: 2 inch split spoon Hammer: 140 lb	Page 1 of 1 Location:
Proj. Loc: Vestal, NY File No.: 25607	Fall: 30 inches	Start Date: 10/18/01 End Date: 10/18/01
Boring Company: Parratt-Wolff, Inc. Foreman: Jim Lansing Drill Rig: CME OBG Geologist: Chawn O'Dell		Screen = Riser Steel //

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing UV Light
0	1	2	-6	1.5/1.3	16	Asphalt from 0 - 0.5 ft below grade then				
			10-9			Moderate yellowish brown 10 YR 5/4,			0.0	neg
						damp, medium dense, fine to coarse				
						SAND, little fine to medium gravel (angular)				
2	2	4	6-6	2.0/1.8	14	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			8-8			damp, medium dense, fine SAND, little				
						medium to coarse sand				
4	3	6	7-9	2.0/1.6	20	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			11-11			damp, medium dense, fine to coarse SAND				
6	4	8	14-12	2.0/1.7	29	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			17-21			damp, medium dense, fine to coarse SAND,				
						some fine to coarse gravel (subrounded				
						to subangular)				
8	5	10	8-5	2.0/2.0	10	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			5-6			damp to saturated, medium dense, fine to				
						coarse SAND, little fine to medium gravel				
						(angular)				
10	6	12	4-4	2.0/2.0	9	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			5-7			saturated, loose, fine SAND				
12	7	14	6-6	2.0/1.9	11	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			5-5			saturated, medium dense, fine SAND				
14	8	16	4-4	2.0/2.0	9	Moderate yellowish brown 10 YR 5/4,			0.0	neg
			4-7			saturated, loose, fine SAND				
16	9	18	8-6	2.0/1.7	17	As above to approx. 17.5 ft, then fine			0.0	neg
			11-20			SAND, some fine to medium gravel				
						(subrounded to subangular)				
18	10	19	21-64	1.0/1.0		Moderate yellowish brown 10 YR 5/4,			0.0	neg
						saturated, extremely dense, fine SAND,				
						some fine to medium gravel (angular),				
						little coarse gravel				

Notes: Well installation details: 2 inch x 0.010 inch slotted PCV screen: 20.0 - 10.0 ft; sand pack: 20.0 - 8.0 ft; bentonite seal: 8.0 - 6.0 ft; cement/bentonite grout: 6.0 - 1.0 ft
The well was completed as a flush mount.

Attachment 2

Guidance for the Development of
Data Usability Summary Reports

Background:

The Data Usability Summary Report (DUSR) provides a thorough evaluation of analytical data without the costly and time consuming process of third party data validation. The primary objective of a DUSR is to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use.

The DUSR and the data deliverables package will be reviewed by the DER Quality Assurance Unit. If data validation is found to be necessary (e.g. pending litigation) this can be carried out at a later date on the same data package used for the development of the DUSR.

Personnel Requirements:

The Environmental Scientist preparing the DUSR must hold a Bachelors Degree in a relevant natural or physical science or field of engineering and must submit a resume to the Division's Quality Assurance Unit documenting experience in environmental sampling, analysis and data review.

Preparation of a DUSR:

The DUSR is developed by reviewing and evaluating the analytical data package. During the course of this review the following questions must be asked and answered:

1. Is the data package complete as defined under the requirements forthe NYSDEC ASP Category B or USEPA CLP deliverables?

2. Have all holding times been met?

3. Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?

4. Have all of the data been generated using established and agreed upon analytical protocols?

5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?

6. Have the correct data qualifiers been used?

Evaluation of NYSDEC ASP Matrix Spike Blank (MSB) data - If the MSB recovery is less that the ASP criteria, the positive results should be qualified as J, estimated biased low. If the MSB recovery is less than the ASP criteria, but greater than 10%, the nondetects should be qualified J, biased low. If the MSB recovery is less than 10%, the nondetect data must be rejected.

Any Quality Control exceedances must be numerically specified in the DUSR and the corresponding QC summary sheet from the data package should be attached to the DUSR. All data that would be rejected by the EPA Region 2 Data Validation Guidelines must also be rejected in the DUSR.

Once the data package has been reviewed and the above questions asked and answered the DUSR proceeds to describe the samples and the analytical parameters. Data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data is discussed. The DUSR shall also include recommendations on resampling/reanalysis. All data qualifications must be documented following the NYSDEC ASP '95 Rev. guidelines.

Attachment 3

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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Attachment 4

I. Soil Gas Implant Construction and Sampling

Soil gas implants will be installed using direct-push technology (Geoprobe®). Implants may have to be advanced with an auger if direct push cannot achieve the necessary depths. Two implants will be placed next to the existing implant TSG-08 on Beckwith Ave. One implant will be placed to a depth of 18" above the ground water table and the other implant at this location will be placed midway between the existing implant (eight feet depth) and the implant placed immediately above ground water. This cluster of three implants is to be installed as a permanent installation. The remaining eight temporary implants will be installed to a depth of approximately seven to eight feet below ground surface to approximate the depth of a typical basement floor. Grab soil samples will be taken for volatiles analysis while drilling the deepest soil vapor implant at each location. The samples will be collected from the base of each implant, and labeled to identify the Geoprobe® implant number and the depth interval. Proper sampling and chain of custody protocols will be used for all samples. All samples will be collected, packaged and shipped for next day delivery to the designated laboratory by the Standby Work Assignment Contractor (SWAC). Underground utility (UFPO) location will be the responsibility of the SWAC.

Permanent and temporary implant screens must be stainless steel and the tubing is to be constructed of either Teflon or polyethylene. Filter glass beads must be placed around the screened portion of the implant. Implants will be six inches in length and are to be constructed of double woven stainless steel wire screen. Implants are to have a pore diameter of 0.0057 inch, which is equivalent to a 0.007 slot well screen. The bottom of the Geoprobe® implants must have a “PRT” style thread, the same fitting style used with Geoprobe® PRT vapor sampling tools. The top connection with the Teflon or polyethylene tubing is a stainless steel “swage lock” or clamp fitting to prevent leakage during sample collection .

A schematic drawing of an example of implant construction can be viewed at Geoprobe®’s Webb site: http://www.geoprobe.com/products/tools/sampling_tools/soil_gas/implantdwg.htm

During construction of the implant, as the probe rod is withdrawn, the annular space around the vapor sampling implant will be filled with glass beads to a depth of six inches above the top of the screen and washed sand will be placed above the glass beads.

The well seal and grout will meet EPA and ASTMD-5092 Method requirements. Tamped and hydrated bentonite pellets will be used for the seal and a high-solids content bentonite grout will be used from the top of the sand to a depth of one foot below grade.

For the permanent implant cluster, a protective casing will be set around the top of the probe tubing and grouted in place to the top of the bentonite. Protective casings are not be placed around temporary implants. Plastic sheathing and bentonite must be placed at the base of each soil gas riser to prevent ambient air from entering the soil gas sample. The casing will be set so that the probe tubing will extend a minimum of six inches above grade and so that there will be clearance for a stopcock valve at the top of the probing tubing. The probe tubing will be supported inside the protective casing with washed sand. This construction will meet ASTM requirements and facilitate

proper abandonment after sampling is completed.

Each of the implants will have a metallic tag, attached by field personnel while it is being constructed, that has a unique identification for the implant and the depth of the base of the implant clearly and permanently stamped.

Temporary implants will be properly abandoned after receipt of validated lab data.

Soil gas samples must be collected in six-liter SUMMA® canisters for lab analysis. Each cleaned SUMMA® canister will have a certification check performed with the flow controller in place. If a cannister is determined to be contaminated, then it will be re-cleaned and re-certified. The six-liter SUMMA® canisters will be provided by the selected lab.

The sampling rate of the canister will be controlled by the use of a calibrated orifice within the flow controller. The calibrated orifice of each flow controller will be preset at the laboratory. The controllers will be attached to the canisters prior to the GC/MS certification check to ensure that the flow controllers are also included in the QA/QC procedures. The cycle time of the canisters shall not exceed thirty days. The cycle time is defined as the time from shipment from the laboratory, through the return shipping and analysis at the laboratory.

The connection to the sampling canister will be made through the use of 1/8th inch internal diameter disposable tubing with swag lock or clamped fittings. Immediately prior to connecting the canister to the soil vapor implant tube, the disposable tubing and the riser tube will be purged of 1 volume using a vacuum pump. A tubing pinch valve will be utilized to seal the end of the tube while the connection to the canister is made and to re-seal the tubing after sampling is completed. A canister with less than 25" of vacuum showing on the vacuum gauge prior to sampling will not be used. The canister and control valve assembly will be kept out of direct sunlight during sampling by using a cloth or plastic drape or an enclosure. This is to prevent undue heating of the flow controller. The sample is to be collected over a one hour period to ensure a flow rate of <0.1 liters per minute.

During sampling no activities will be permitted in the immediate area that involve using materials containing VOCs. The area will be inspected prior to sampling and any containers of oil, gasoline and any other hydrocarbons are to be removed from the area. Sampling personnel will use caution and avoid activities that can influence the sample results, such as pumping gas prior to sampling, using marking pens with the sampling devices, or wearing freshly dry-cleaned clothing while sampling. The sampling point will be monitored during sample collection to insure that the gas implant, the tubing and valves, and the canister remain intact and undisturbed.

A slight vacuum will be left in the canister at the end of sampling so that it may be documented that the canister did not leak during transit.

II. Soil Gas Analyses

The samples will be logged and will be shipped by the SWAC via standard Chain of Custody (COC)

protocols to a laboratory, to be selected by the DEC, for analyses of the select chlorinated VOCs via United States Environmental Protection Agency (USEPA) Compendium method TO-15 using selective ion monitoring (SIM). A detection limit of $1ug/m^3$ must be obtained.
To determine if ambient air is entering the implant during sampling, 100% Sulfur hexaflouride (SF_6) is to be released around the top of the implant and the soil during sampling. The SF_6 must be screened in the field, prior to sampling and immediately after sampling, to determine if atmospheric short circuiting is occurring. After canister sample collection, a soil vapor sample for field screening will be collected from each of the soil gas points into a one-liter Tedlar bag. The Tedlar bag sample must be screened for carbon dioxide (CO_2), oxygen (O_2), methane (CH_4) and total volatile organic compounds (VOCs) with a properly calibrated photoionization detector (PID) equipped with a 10.6 eV lamp, and a properly calibrated flame ionization detector (FID).

III. Substructure Soil Gas Sampling (Second Phase)

Sub-slab soil gas samples will be obtained by a sampling port through a vapor barrier such as a floor slab or plastic liner. The procedures for subsurface soil gas collection will be dependent on construction of the basement area. In general, in homes with a crawl space or basement without an apparent vapor barrier, sub-slab samples will be collected over an approximately twenty four hour period, concurrent with indoor air sampling. For homes with an apparent vapor barrier, samples will be collected as a short-term duration (approximately one hour) grab sample after the twenty four hour indoor air sample has been completed. Prior to sampling, an occupant/owner interview and building survey must be performed to determine if an apparent vapor barrier exists.

Selection and preparation of a sample collection point will be performed by observing the condition of the building floor slab for apparent penetrations such as concrete floor cracks, floor drains, or sump holes. The floor conditions will be noted and a potential location for a temporary or permanent subsurface probe will be selected. The location should be central to the building away from the foundation walls and apparent penetrations. The proposed location will be reviewed with the occupant/owner and a description will be given of how the sampling will be performed. After receiving permission for sampling, from the occupant/owner, the location of sampling will be marked, documented and photographed.

Using a PID and a FID, indoor air and penetrations such as concrete floor cracks, floor drains, and sump holes will be screened. PID and FID readings will be recorded. If practicable, features such as floor drains or sumps should be sealed during the collection of the subsurface sample.

The following sampling preparation procedure is to be followed:

1. Drill a 1" diameter hole about 1" into the concrete using an electric hammer drill. Extend the hole through the remaining thickness of the slab using a 3/8" drill bit. Extend the hole about 3" into the sub-slab material using either a drill bit or a steel probe rod.

2. Insert a section of 3/8" O.D., 1/4" I.D. Teflon-line polyethylene tubing to the bottom of the floor slab.

3. Seal the annular space between the 1" hole and the 3/8" tubing by seating a tapered laboratory-grade silicone rubber plug perforated with a 3/8" hole into the hole and capping the stopper with a beeswax seal, if necessary.

4. Connect the tubing to a Teflon lined air sampling pump with a polyethylene discharge tubing. Purge approximately 1 liter of gas from the subsurface probe using the air sampling pump. The sampling pump discharge should be collected in a 1 liter Tedlar bag and screened using the PID and FID.

5. Disconnect the air sampling pump and plug the end of the tubing.

For preparation of the SUMMA® cannister and collection of the sample, the following procedure is to be followed:

A. Place SUMMA® cannister adjacent to subsurface probe.

B. Record SUMMA® cannister serial number on the chain of custody (COC).

C. Assign sample identification on cannister I.D. tag and record on COC.

D. Remove brass plug from cannister fitting.

E. Install pressure gauge/metering valve on cannister valve fitting.

F. Open and close cannister valve.

G. Record gauge pressure. Gauge pressure must read > 25" of Hg.

H. Remove brass plug from gauge and install particulate filter onto metering valve input.

I. Connect subsurface probe to end of in-line particulate filter.

J. Open cannister valve to initiate sample collection.

K. Take digital photograph of cannister setup and surrounding area.

L. Record local time on COC.

Procedure for termination of sample collection:

A. At end of twenty-minute sample collection period, record gauge pressure.

B. Record local time on COC.

C. Close cannister valve.

D. Disconnect polyethylene tubing and remove particulate filter and pressure gauge from cannister.

E. Install brass plug on cannister.

F. Remove temporary subsurface probe and properly seal hole in the slab.

For samples collected from a crawl space or basement without an apparent vapor barrier, the cannister will be placed at breathing zone height, or in a crawl space, about one foot above the floor. In general, areas near windows or other potential sources of air currents (drafts), and air supply vents should be avoided. All other sample procedures must be performed as described above for sub-slab sampling.

IV. Indoor Air Sampling

For indoor air sampling follow the sampling procedure for a basement without an apparent vapor barrier (See Section VI).

V. Ambient Air and Groundwater

Ambient air samples are to be collected daily during the sampling of the implants sample. Ambient air samples are to be collected in the study area in the assumed upwind direction. Samples are to be collected into laboratory approved pre-evacuated and certified, stainless-steel SUMMA ® canisters. The samples will be logged and recorded on a chain of custody form and will be shipped by the SWAC to the designated analytical laboratory and analyzed for chlorinated VOCs only, by EPA Method TO-15 using selective ion monitoring (SIM). A detection limit of 1 ug/m^3 must be obtained. Ambient air must be screened with a properly calibrated PID and FID. All readings will be recorded by the SWAC. The collected samples will be properly packaged and shipped by the SWAC to the designated lab for analysis.

A ground water sample will be collected from each of the direct push sampling points and monitoring wells and recorded and shipped by the SWAC to the designated laboratory for GCMS analysis for chlorinated VOCs. Each monitoring well will be purged by the following procedure:

1.) The placement of a submersible pump (Whale Pump) one foot into the static water column. 2.) The withdrawal of three gallons of groundwater at a flow rate that will not drop the static water level in the well by more than six inches.
3.) Pumping until the pH, conductivity, and temperature have stabilized.

IX. Quality Assurance/Quality Control (QA/QC)

All soil and ground water analyses must be performed by an ELAP approved laboratory, and must follow ASP protocols with Category B deliverables. All laboratory work will be performed by a NYSDEC Division of Environmental Remediation contract lab and is not part of this IIWA. The SWAC will be provided with the name and address of the selected lab in order to obtain the necessary sampling containers and to ship samples after collection. Shipping and analyses of the samples will be arranged by the SWAC so that the holding time limits will not be exceeded. QA/QC measures must include the preparation of equipment blanks and trip blanks for soil gas and ground water samples. One ambient air sample per indoor air sampling cluster shall be collected on any and all days of sampling. The analysis of all QA/QC samples will be performed for the same compounds listed below, using the same USEPA methods. Laboratory prepared trip blanks will accompany soil vapor samples through the sampling cycle at two locations, and will be shipped and analyzed with the gas implant samples. Field duplicate samples will be taken from two gas implants. Duplicate samples must be obtained by sampling in parallel, not in series, with a tee-fitting arrangement. During duplicate sampling, flow rates must be adjusted to get equally representative samples in each canister.

Field duplicate samples must be collected for both ground water and soil in addition to the soil gas samples.

X. Equipment Cleaning

All subsurface tools and equipment used during the advance and installation of any soil gas point specified in this IIWA project will be cleaned using the best available NYSDEC approved method, prior to their introduction or re-introduction into any given point, at the discretion of the DEC representative.

One of the proposed cleaning methods incorporates the use of a high-pressure steam cleaner to wash the large diameter samplers and push rods used during the IIWA project. An alternative method, that may be used to clean large diameter samplers and push rods, involves a water wash, followed by an Alconox-solution wash and a final distilled water rinse. If oily residues are present, a pesticide grade methanol rinse will be added to remove any oily residues prior to the final distilled water rinse. One of these specifications shall be followed, in order to reduce the potential for cross contamination of any samples and to ensure that the integrity of each soil gas point is reasonably maintained.

Attachment 5

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH ASSESSMENT
BUREAU OF TOXIC SUBSTANCE ASSESSMENT

INDOOR AIR SAMPLING & ANALYSIS GUIDANCE
August 8, 2001

SCOPE:

Air testing for specific chemical compounds can be performed to determine whether petroleum spills or other contaminant sources affect indoor air quality. This document provides guidance for preparing sites and collecting samples for laboratory analysis to ensure the integrity of the test results and allow for meaningful interpretation of the data.

Forms (attached) - Indoor Air Quality Questionnaire and Building Inventory Form
- Product Inventory Form

OBJECTIVE:

The purpose of this document is to outline the recommended procedure for testing indoor air for volatile organic chemicals (VOCs). The procedure includes pre-sampling inspection and preparation of homes, product inventories, collection of samples, analytical method selection.

1. Pre-sampling inspection and preparation of homes:

A pre-sampling inspection should be performed 2 or 3 days prior to testing (if possible) to evaluate the type of structure, floor layout and physical conditions of the building(s) being studied and to identify and minimize conditions that may affect or interfere with the proposed testing. This information along with information on sources of potential indoor contamination should be identified on the building inventory form. Portable organic vapor monitoring equipment (i.e. photoionization detectors (PIDs)) can be used to help evaluate potential interferences. Items to be included in the building inventory include use or storage of petroleum products including gasoline operated equipment, unvented kerosene heaters, recent use of petroleum based finishes or products containing petroleum distillates. Potential interferences should be corrected during the pre-sampling inspection. Removing the source from the indoor environment prior to testing is the most effective means of reducing the interference. Ensuring that containers are tightly sealed may be acceptable, but should be tested with a PID to demonstrate that the seal is tight. The inability to eliminate potential interference may be justification for not testing. Once these interfering conditions are corrected, aggressive ventilation may be needed prior to testing to eliminate residual contamination.

Any ventilation should be done twenty-four hours or more prior to the scheduled sampling time. If ventilation is deemed necessary, ventilate the house by opening windows and doors for at least 10 to 15 minutes. House ventilation should be avoided 24 hours prior to and during testing. During colder months, heating systems should be operating for at least twenty-four hours prior to the scheduled sampling time to maintain normal indoor temperatures above 65^0 F before and during sampling.

FOR 24 HOURS PRIOR TO SAMPLING, DO NOT

- open any windows, fireplace dampers, openings or vents,
- operate ventilation fans unless special arrangements are made,
- smoke in the house,
- paint,

- use wood stove, fireplace or other auxiliary heating equipment, (eg. kerosene heater),
- operate or store automobile in attached garage,
- allow containers of gasoline or oil to remain within the house or garage area, except for fuel oil tanks,
- clean, wax or polish furniture or floors with petroleum or oil-based products,
- use air fresheners or odor eliminators,
- engage in any hobbies which use materials containing volatile organic chemicals,
- use cosmetics: including hairspray, nail polish, nail polish removers, etc.
- apply pesticides.

2 . Product Inventories:

Some household products contain volatile organic chemicals (VOCs) which can contribute to levels of VOCs in air. Products in buildings should be inventoried every time air is tested to provide an accurate assessment of the potential contribution of VOCs. Each room in the building should be inspected and products that contain VOCs should be listed on the Products Inventory Form along with PID readings obtained near the container. If available, the volatile ingredients should be recorded for each product. If the ingredients are not listed on the label, record the manufacturer's name and address or phone number if available.

3. Collection of Samples

To characterize contaminant concentration trends and potential exposures, air samples should be collected from the basement, first floor living space, and from outdoors. In settings with diurnal occupancy patterns such as schools and office buildings, samples should be collected during normally occupied periods to be representative of typical exposure. Sample collection intakes should be approximately three feet above the floor level to represent breathing zones. To ensure that air is representative of the locations sampled and to avoid undue influence from sampling personnel, samples should be collected for 2 to 8 hours, but at least a one-hour period and personnel should avoid lingering in the immediate area of the sampling device while samples are being collected. Sample collection techniques vary depending on the analytical method(s) being used and sample flow rates must conform to the specifications in the sample collection method. Some methods require collecting samples in duplicate. Sampling personnel should be completely familiar with the sampling protocol for the particular method being used.

a. Quality Assurance/Quality Control

Extreme care should be taken during all aspects of sample collection to ensure that high quality data are obtained. The laboratory should use only certified clean sample collection devices. The sampling team members should avoid actions which cause sample interference such as pumping gas prior to testing or using permanent marking pens in the field. Once samples are collected, they should be stored according to the method protocol and delivered to the analytical laboratory as soon as possible. Samples should not exceed recommended holding times prior to being processed by the laboratory. Blanks should be submitted and analyzed with the samples to provide a quality check. Laboratory procedures for sample accession and chain of custody should be followed.

b. Sampling Information

Detailed information must be gathered at the time of sampling to document conditions during sampling to aid in interpretation of the test results. The information should be recorded on the building inventory form. Floor plan sketches should be drawn for each floor and should include the floor layout with sample locations, any chemical storage areas, garages, doorways, stairways, location of basement

sumps and any other pertinent information including compass orientation (north). Outdoor plot sketches should include the building site, area streets, outdoor sample location, the location of potential interferences (such as gas stations, factories, lawn mowers), wind direction and magnetic orientation (north). In addition, any pertinent observations such as odors and PID readings should be recorded on the building inventory form and on associated sample accession forms.

The products inventory shall include those items discussed in Section 2.

c. Sample Analysis

New York State Law requires laboratories analyzing environmental samples from New York State to have current Environmental Laboratory Approval Program (ELAP) certification for certain contaminant categories and media (air, water, solid waste).

The goal of indoor air sampling is to evaluate exposure to VOCs by measuring levels low enough to compare to background indoor air levels. Therefore, the samples must be analyzed by methods that can achieve minimum detection limits of at least one part per billion (ppb) (1 to 7 micrograms per cubic meter (mcg/m^3) depending on the molecular weight for each compound). Several analytical methods for VOCs in air are capable of achieving these detection limits including Environmental Protection Agency (EPA) Method TO-14A/TO-15 and EPA Method TO-1/TO-2. Prior to choosing an analytical method, the laboratory should verify they are capable of detecting target compounds.

Petroleum is a mixture of many individual compounds. Various petroleum products (i.e. gasoline, diesel, fuel oil) have different chemical constituents and specific aromatic and aliphatic compounds can be good indicators for individual petroleum products. Analytical methods using a mass spectrometer detector allow for the identification of aromatic and aliphatic hydrocarbons, and oxygenated compounds such as ethanol, acetone and methyl tertiary butyl ether (MTBE).

Target compounds for gasoline may include the aromatics: benzene, toluene, ethylbenzene and xylenes; C-4 to C-8 straight and branched aliphatics; and the oxygenate additive MTBE.

Target compounds for fuel oil may include the aromatics: benzene, toluene, ethylbenzene, xylenes, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-butylbenzene, sec-butylbenzene and tert-butylbenzene; and C-9 to C-12 straight and branched aliphatic hydrocarbons.

Sampling for other potential contaminants may involve different target compound(s) and different analytical methodology.

For additional information contact Mr. Gerry McDonald or Mr. Michael Hughes of the Bureau of Toxic Substance Assessment (518) 402-7810.

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH ASSESSMENT
BUREAU OF TOXIC SUBSTANCE ASSESSMENT

INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date Prepared _____

Preparer's Affiliation _____ Phone No._____

1. **OCCUPANT** Name: _____

Address: _____

_____

County: _____

Home Phone No. _____Office Phone No _____

2. **OWNER OR LANDLORD**: (If different than occupant) Name: _____

Address: _____

_____

Phone No. _____

A. Building Construction Characteristics

Type (circle appropriate responses): Single Family Multiple Dwelling Commercial

Ranch	2-Family
Raised Ranch	Duplex
Split Level	Apartment House _____ Units
Colonial	Number of floors _____
Mobile Home	Other specify _____

Residence Age _____ General Description of Building Construction Materials _____

_____

Is the building insulated? Yes / No How air tight is the building _____

OSR-3 (continued)

B. <u>Basement construction characteristics (circle all that apply</u>):

1. Full basement, crawlspace, slab on grade, other _____
2. Basement floor: concrete, dirt, other _____
3. Concrete floor: unsealed, painted, covered; with _____
4. Foundation walls: poured concrete, block, laid up stone, other _____
5. The basement is: wet, damp, dry _____Sump present? y / n _____Water in sump? y / n ____
6. The basement is: finished, unfinished _____
7. Identify potential soil vapor entry points (e.g., cracks, utility ports etc.)

   _____

8. Describe how air tight the basement is _____

   _____

C. <u>HVAC (circle all that apply)</u>:

1. The type of heating system(s) used in this residence is/are:

Hot Air Circulation	Heat Pump
Hot Water Radiation	Unvented Kerosene Heater
Steam Radiation	Wood stove
Electric Baseboard	Other (specify) _____

2. The type(s) of fuel(s) used is/are: Natural Gas, Fuel Oil, Electric, Wood Coal Solar

   Other (specify) _____.

3. Is the heating system's power plant located in the basement or another area: _____.
4. Is there air-conditioning? Yes / No Central Air or Window Units?

   Specify the location _____

5. Are there air distribution ducts present? Yes / No
6. Describe the supply and cold air return duct work in the basement including whether there is a cold air return, the tightness of duct joints

   _____

   _____

OSR-3 (continued)

D. Potential Indoor Sources of Pollution

1. Has the house ever had a fire? Yes / No
2. Is there an attached garage? Yes / No
3. Is a vehicle normally parked in the garage? Yes / No
4. Is there a kerosene heater present? Yes / No
5. Is there a workshop, hobby or craft area in the residence? Yes / No
6. An inventory of all products used or stored in the home should be performed. Any products that contain volatile organic compounds or chemicals similar to the target compounds should be listed. The attached product inventory form should be used for this purpose.
7. Is there a kitchen exhaust fan? Yes / No Where is it vented? _____
8. Has the house ever been fumigated? If yes describe date, type and location of treatment. _____

E. Water and Sewage (Circle the appropriate response)

Source of Water

Public Water Drilled Well Driven Well Dug Well Other (Specify) _____

Water Well Specifications:

Well Diameter _____ Grouted or Ungrouted _____

Well Depth _____ Type of Storage Tank _____

Depth to Bedrock _____ Size of Storage Tank _____

Feet of Casing _____ Describe type(s) of Treatment _____

_____

Water Quality:

Taste and/or odor problems? y / n If so, describe _____

How long has the taste and/or odor been present? _____

Sewage Disposal: Public Sewer Septic Tank Leach Field Other (Specify) _____

Distance from well to septic system _____ Type of septic tank additive _____

F. Plan View

Draw a plan view sketch for each floor of the residence and if applicable, indicate air sampling locations, possible indoor air pollution sources and PID meter readings.

G. Potential Outdoor Sources of Pollution

Draw a sketch of the area surrounding the residence being sampled. If applicable, provide information on the spill location (if known), potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system if applicable, and a qualifying statement to help locate the site on a topographical map.

Household Products Inventory

Occupant / residence _____

Investigator: _____ Date: _____

Product description (dispenser, size, manufacturer …)	VOC Ingredients	PID Reading