WORK PLAN
DRAFT (80 Percent Submission)

Photocircuits/Pall Corp
OU2 (Deep Groundwater) RI/FS

Photocircuits (#130009),
Pall Corp (#130053B)

Work Assignment No. D004436-04

Prepared for:

SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
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1.0 INTRODUCTION

Earth Tech Northeast, Inc. (Earth Tech) has been issued Work Assignment # D004436-04 under the New York State Department of Environmental Conservation (NYSDEC) State Superfund Standby Contract for Investigation and Design Services (D00436). The scope of work is to conduct a remedial investigation and feasibility study (RI/FS) of deep groundwater (Operable Unit 2 [OU2]) at the Photocircuits and Pall Corporation sites (NYSDEC registry numbers 1-30-009 and 1-30-053B, respectively). The site location is shown on Figure 1, and the site layout is shown on Figure 2.

Earth Tech has developed and submitted this work plan for NYSDEC's review and approval. It includes a detailed budget based upon the scope of work outlined in the work assignment (WA) letter issued by NYSDEC on August 15, 2006, with modifications recommended by Earth Tech as identified in this Work Plan and the accompanying technical plans (Field Activities Plan and Quality Assurance Project Plan). In addition, this submittal includes a Minority/Women Business Enterprise (M/WBE) utilization plan, a subcontractor utilization plan, and a staffing plan.

Additional details regarding the execution of this project are found in the associated plans, included as appendices:

Appendix A – Field Activities Plan
Appendix B – Quality Assurance Project Plan
Appendix C – Site Safety and Health Plan (to be submitted separately)

2.0 SCOPE OF WORK

The purpose of this Engineering Standby Contract Work Assignment is to conduct a RI/FS for deep groundwater (60 feet below ground surface [ft bgs] or deeper) at the Photocircuits Corporation and Pall Corporation sites in Nassau County.

2.1 TASK 1 – WORK PLAN DEVELOPMENT

Task 1 is broken down into two parts: Task 1A, draft work plan, and Task 1B, final work plan.

2.1.1 Task 1A – Draft Work Plan

Earth Tech will develop and submit a Draft Work Plan (this document). In accordance with the site-specific work assignment, the draft Work Plan includes the following:

- Summary of the site reconnaissance and records searched described below (note that, if agreed to by NYSDEC, parts of the records search below may be omitted if the information (a) has already been obtained during investigations of the listed NYSDEC Registry sites, or (b) would not be useful or relevant to the deep groundwater investigation for which this plan is being developed). For each of the items in the scope of work, the status of the records search and Earth Tech's recommendation is also provided.
    - Review of available background information starting with documents from the NYSDEC Central and Regional Office, Nassau County Department of Health.
        - Earth Tech visited NYSDEC offices and photocopied and/or scanned documents in NYSDEC files for the Pall Corp site and for Photocircuits. Earth Tech has also had conversations with NYSDEC Region 1, Nassau County DOH, and also with Nassau County Department of Public Works.
    - Regulatory Database Review, including review of the Remedial Investigation, Interim Remedial Measure(s) and groundwater monitoring reports for the Photocircuits, Pass and Seymour, and Pall sites (sites 1-30-009, 1-30-053A and 1-30-053B), and the Site Characterization report for the Sea Cliff Avenue Industrial Area.
        - Earth Tech has reviewed the file information obtained from NYSDEC (first bullet) which includes the specific reports mentioned in this bullet. Earth Tech has not located a "Sea Cliff Avenue Industrial Area Site Characterization" Report; we are assuming that this reference is to the "Source Area Investigation – Sea Cliff Industrial Area" prepared by H2M in 1992. Earth Tech has reviewed this report (H2M, 1992).
        - Earth Tech has also searched the NYSDEC DER and other internet databases. Approximately ten NYSDEC Registry Sites were located in Glen Cove or nearby Glen Head. However, based on the distance and direction of these sites, none are considered likely to impact the water quality at the Carney Street Wellfield.

- Interviews with knowledgeable individuals.
  - Earth Tech does not propose to conduct interviews *per se*; however, Earth Tech has contacted numerous individuals from organizations who may have records related to this project. This task is ongoing, as not all the relevant records which Earth Tech believes exist have been located yet. Earth Tech has submitted a FOIL request ("Application for Freedom of Information") to Nassau County DPW for additional historical reports and boring logs; this information is expected to arrive shortly. Other information is still being tracked down (e.g., the 2000 report prepared by Sidney B Bowne for the City of Glen Cove; boring logs and well access information from Photocircuits' consultant, Apex; etc.).
- Historical land title records review (property tax files, recorded land titles, building department records, zoning/land use records, libraries, and historical societies, etc.)
  - Earth Tech has noted that much of this information was provided in early investigations; updating and supplementing this information is not likely to be useful to the deep groundwater RI and as such Earth Tech does not recommend any further investigation/review of these records.
- Historical aerial photograph review
  - Earth Tech has noted that much of this information was provided in early investigations; updating and supplementing this information is not likely to be useful to the deep groundwater RI and as such Earth Tech does not recommend any further investigation/review of these records
- Review of regional and local geology and hydrogeology
  - Earth Tech has reviewed the geologic and hydrogeologic information summarized in other reports; and also the 200-2003 Groundwater Report With Historical Information prepared by Nassau County DPW; regional data from USGS (2002); other information e.g., (boring logs for Nassau County-installed wells; the 1998 Groundwater Report) is 'pending' from Nassau County DPW.
- Regulatory information to be collected related to permits, prosecutions/control orders/work orders/complaints or any violations.
  - Earth Tech has noted that much of this information was provided in early investigations; updating and supplementing this information is not likely to be useful to the deep groundwater RI and as such Earth Tech does not recommend any further investigation/review of these records
- Property use records such as fire insurance maps, city directory searches and contaminated site and property-use registries where available
  - Earth Tech has noted that much of this information was provided in early investigations; updating and supplementing this information is not likely to be useful to the deep groundwater RI and as such Earth Tech does not recommend any further investigation/review of these records

- Company records search for useful documents such as building plans, environmental monitoring data, waste management records
  - Earth Tech has noted that much of this information was provided in early investigations; updating and supplementing this information is not likely to be useful to the deep groundwater RI and as such Earth Tech does not recommend any further investigation/review of these records
- Geological and geotechnical reports on the environmental condition of subject property.
  - Earth Tech has obtained and reviewed USGS and Nassau County (2005) reports, and has obtained and is compiling information from boring logs for wells in the area. This task in on-going, as some relevant information has not yet been acquired.

As noted above, Earth Tech suggests modification of this part of Task 1 to focus on information most likely to be relevant to the deep groundwater RI/FS. Much of the work has been done previously and submitted in other reports, and repeating that work is not likely to be useful for this scope of work. Earth Tech proposes to focus on review of the reports generated for, or in NYSDEC's possession, for Pall, Photocircuits, and Pass & Seymour. Earth Tech will also conduct detailed review of geologic information both in the NYSDEC reports and from other sources (e.g. USGS open file reports). An EDR report (Sanborns, aerial photographs, historical topographic map quads, Geocheck) might be useful also and is relatively low cost (although this is not included in the attached cost proposal).

- Site Reconnaissance visit with the NYSDEC Project Manager scheduled by the NYSDEC within two weeks of the Engineer's acceptance of the Work Assignment (this item was completed on September 7, 2006)
- A general scope of work for the Remedial Investigation
- Identification of the preliminary field activities and primary areas of concern
- A detailed level of effort for work plan development
- Preliminary level of effort and budget for Remedial Investigation
- Preliminary schedule of milestones and deliverables
- List of key staff, their titles and responsibilities
- Preliminary subcontracting list including a Minority/Women-owned Business Enterprise (M/WBE) Utilization Plan

2.1.2 Task 1B – Final Work Plan

Earth Tech will submit the final work plan to the NYSDEC within four weeks after the NYSDEC's acceptance of the Draft Work Plan and concurrence between NYSDEC and Earth Tech as to how comments on the Draft will be implemented in the final work plan. Development of a Final Work Plan will include, if necessary, a meeting between Earth Tech and appropriate NYSDEC staff in Albany to review comments and details of the Draft Work Plan. The Final Work Plan will include the following:

- Detailed level of effort and budget for all work, including subcontracting.
- All pertinent information to conduct field activities including sampling locations, analytical methods, and a detailed schedule of progress with milestones and deliverables. Any decisions to be made in the field will be clearly stated.
- Summary of the site reconnaissance and records searched described above.
- Staffing Plan that identifies and states the responsibilities of the primary staff who are to manage and oversee these characterizations.
- The identity of the subcontractors and the M/WBE commitment
- Site-specific Health and Safety Plan, Quality Assurance Project Plan, and a Citizen Participation Plan as follows:
    - Health and Safety Plan - This site-specific plan will be developed based on the Earth Tech's internal policies, which are compliant with federal (OSHA) requirements. The plan will include a section on Community Health and Safety as well as Community Air Monitoring, as set forth in the NYSDEC generic Community Air Monitoring Plan.

      The Health and Safety Plan will address working in the right-of-way for Sea Cliff Avenue, as at least two (although from the site visit, there may be more than two) of the existing monitoring wells are in the center line of Sea Cliff Avenue. In addition, due to utility constraints, it appears that some of the new monitoring wells proposed for the north side of the Photocircuits property may need to be installed in Sea Cliff Avenue also (to avoid overhead utilities).

      Due to internal (Earth Tech) review requirements, the preliminary Health and Safety Plan will be submitted separately, as agreed to by the NYSDEC project manager, in order to not delay submission of the other project plans.

    - Quality Assurance Project Plan will be prepared by the Earth Tech that identifies the steps taken to protect sample quality throughout the Work Assignment. Samples will be analyzed by a NYSDOH ELAP certified Lab for the methods selected. This plan will comply with all elements in Schedule 1, Work Element V of the standby contract. A third party, independent of the laboratory that analyzed the samples, will be subcontracted by Earth Tech to validate the analytical data generated for this RI/FS. A Data Usability Summary Report (DUSR) will be prepared and submitted to the NYSDEC with the report.

      The preliminary QAPP is included as Appendix B to this work plan.

    - Citizen Participation Plan – Earth Tech will develop a Citizen Participation Plan (CPP) which will identify groups, individuals, and officials that may be interested in any remedial activities that take place at these sites. This plan will involve determining the addresses of adjacent property owners and local officials, advocacy groups. If requested by NYSDEC, Earth Tech will provide information and help plan public meetings (as requested by NYSDEC) or generate a fact sheet to be distributed to the addresses compiled.

      The preliminary CPP is provided in Section 2.5 of this work plan.

- In addition to the specific plans identified above, Earth Tech has also prepared a Field Activities Plan (FAP; Appendix A). The FAP includes all activities typically included in a field sampling plan, but is identified as a field activities plan since it addresses activities other than sampling, including geophysical surveys, land surveying, well condition survey, aquifer pump tests, investigation-derived waste management, and other items.

2.2 TASK 2 –REMEDIAL INVESTIGATION

A remedial investigation will be conducted to determine the sources of contamination within the site and its threat to human health or the environment. The scope of work for the RI is presented below.

2.2.1 Base Map Development

Prior to sampling, an initial map of the site will be produced by a land surveyor licensed by the State of New York (YEC of Valley Cottage, NY). The basis of bearings and elevations of the survey will be in accordance with the New York State Plane Coordinate System (North American Datum [NAD] 1983) and North American Vertical Datum (NAVD) of 1988. The map will be at the scale of 1" = 40'. The mapping will include, at a minimum, existing site features, structures, aboveground utilities, horizontal limits of Glen Cove Creek, limits of vegetation, ditches, sidewalks, curbs, catch basins, trials, streets, fences, gates, and other significant physical and environmental sensitive features.

The mapping will be done in two stages. The initial mapping will be done prior to implementation of the intrusive field work (i.e., well installation) and will generate the base map as well as elevations and locations of existing wells listed on Table 2-1 and shown on Figure 3. This survey will be conducted approximately concurrently with the existing well condition survey (see 2.2.2, below).

New monitoring wells will be surveyed after installation in a second mobilization. During this second mobilization, any additional features identified as needing to be surveyed (subsequent to the initial baseline survey) can be surveyed, as well as verification of any data points which appear suspect or anomalous.

During the field work, the location of each sample point will be determined (±0.1 ft) and presented on the revised base map with a scale of one inch to 40 ft.

2.2.1.1 Task 1 - Physical Features Survey

The task to be performed by the land surveyor (YEC) includes a physical features survey. The survey will be signed, sealed and certified by a Land Surveyor licensed to practice in the State of New York. The basis and bearings of the survey shall be in accordance with the New York State Plane Coordinate System (North American Datum [NAD] 1983) and North American Vertical Datum (NAVD) of 1988.

A physical features survey will be produced at a scale of 1"=40' for the area (approximately 45 acres) shown on the Earth Tech-supplied file: Photocircuits-Pall Vicinity Google Aerial.pdf dated 9/12/06. The mapping shall, at a minimum show existing site features including structures, utilities, horizontal limits of surface water bodies, limits of vegetation, ditches, sidewalks, curbs, catch basins, trails, streets, fences, gates, and other significant physical and environmentally

sensitive features. The dimensions and locations of the following shall be included on the physical features survey:

- All existing groundwater monitoring wells to be sampled (53) and Well no. 21 (N8326)
- All new groundwater monitoring wells (29) and hydropunch sampling locations (2)
- Above ground utilities
- All structures
- Fences and gates
- Limits of ground surface coverings (e.g., concrete, asphalt, landscaping, etc.). The type of ground covering shall be specifically called out;
- Drainage structures
- Utility poles, light poles and traffic signs
- Culverts and headwalls
- Manhole and valve box covers
- Transformers
- Underground utilities, pipelines and structures as marked during utility markout
- Surface elevations and top of casing elevations of existing and new monitoring wells (well designations will be provided to surveyor)
- Approximate property boundaries from tax maps to include block and lot numbers and approximate property boundaries, easements, rights of way, structures, and adjacent property boundaries

A site map will be developed from aerial photogrammetry at a scale of 1"=40' with a horizontal accuracy of 1/40" at map scale (or ±1'). The ground control for the site map will be performed by GPS with a horizontal accuracy of ±½" and a vertical accuracy of 3" (3/4" relative accuracy) to tie in with NAD 1983 and NGVD 1988. The aerial survey will then be enhanced by a ground survey performed by a licensed surveyor in which wells will be surveyed with a horizontal and vertical accuracy of ± 0.01' with respect to the control.

The survey will only include ground elevations at well locations, well casings, and top of PVC.

2.2.1.2 Schedule

The flight for the aerial survey should be done after the leaves have fallen and prior to snow cover on the ground.

- December 1: Notice to Proceed (assumed)
- Week of December 4: Conduct ground control
- Week of December 11: Aerial flight
- Week of January 1: Aerial mapping ready
- Weeks of January 8 and January 15 (8 days): Conduct ground survey (verify and identify relevant aerial site features, survey existing monitoring wells)
- Week of January 29: Submit draft map(s) of existing site features
- Week of April 2: Completion of new well installation (assumed)
- Week of April 9: (3 days) Ground survey of new wells (to coincide with sampling of wells installed in road on Sea Cliff Ave)

- Week of April 23: Submit draft map(s) of existing site features updated with new well locations
- Week of May 7: Receive comments on submitted map
- Week of May 14: Submit final map(s)

2.2.1.3 Deliverables

It is anticipated that three drawings will be prepared for this survey: the southern portion of the site (south of Sea Cliff Avenue) at 1"=40' (24" x 36" sheet), the northern portion (north of Sea Cliff Avenue) of the site at 1"=40' (24" x 36" sheet); and the entire site including offsite wells at 1"=100' (30" x 42" sheet). One reproducible print, 3 blueprints and electronic files (AutoCAD Release 2000 drawing file and ASCII survey point file) on compact disk (CD) will be submitted for each drawing. Blueprints will be signed, sealed and certified by a licensed New York Land Surveyor, Donald Stedge, YEC, Inc. Reproducibles are not to be signed or sealed.

2.2.1.4 Safety

Three of the existing wells to be surveyed are located in the middle of Sea Cliff Avenue, a fairly busy street which is the primary access for a number of industrial buildings. This could present a hazard to personnel surveying these wells. As such, survey personnel will be required to wear orange vests and to set up cones to warn traffic while surveying on this road. In addition, they will survey these wells during daylight hours at a time when traffic is at a minimum. If traffic control is needed to survey proposed wells, this portion of the survey will be conducted while traffic control is in place.

2.2.2 Existing Well Condition Survey

In order to properly plan and execute subsequent investigative tasks (e.g., groundwater sampling), it is necessary to locate the existing monitoring wells, and to assess their condition prior to sampling.

Earth Tech and YEC personnel performed a limited site reconnaissance on September 7, 2006 (later accompanied by the NYSDEC project manager). During this site reconnaissance, it became apparent that there are ambiguities with regard to the location and identity of some of the monitoring wells, including wells on the Pall Corp site (including August Thomsen), the Photocircuits site, and the wells in the center of Sea Cliff Avenue. In some cases, wells could not be located (e.g., Photocircuits wells 16-PCI/PCD, in front of the former Slater Electric/Pass and Seymour site; one of the MW-8P/8S doublet in front of Pall Corp.). In other cases, due to the presence of multiple wells, including injection wells and pilot study monitoring wells (on the northern part of the Pall/August Thomsen site), it could not be readily determined which of the many flushmount well covers were for monitoring wells which are planned for sampling, and which were installed for other purposes and will not be sampled. It was also noted that in some cases the flushmount covers were missing and the inner pressure closure did not appear to be in good condition; and in at least one case (probably Pall Corp well MW-5-P, although this could not be determined definitively) the well appeared to be subject to flooding; possibly due to artesian conditions in wells immediately to the south (pilot study wells), or merely due to the well being located in a low spot and subject to flooding due to poor drainage. On the Photocircuits side, there are extraction and injection/diffusion wells present (not shown on the

figures) which also increase the difficulty of proper identification of the monitoring wells planned for sampling.

Accomplishing this task will require coordination with several entities, as noted below.

- Photocircuits – During the site visit, neither Earth Tech nor Photocircuits representatives could locate or identify some of the monitoring wells (e.g., MW-13, MW-14, and MW-7), based on field observations. It was suspected that at least one of the wells may not have been visible due to it being covered by a pallet of equipment. Identification of the monitoring wells is made more difficult due to the presence of soil vapor extraction points on the east side of the site, and injection/diffusion wells (in addition to monitoring wells) on the north side of the site (along Sea Cliff Avenue, especially the area nearer the Glen Cove Arterial Highway). Earth Tech will coordinate with Photocircuits personnel (and their engineer) to locate and identify the monitoring wells on the Photocircuits site (including the former Pass and Seymour/Slater Electric, which is currently also occupied by Photocircuits), and also to arrange for access to the wells for the initial well survey, civil survey, and subsequent sampling.

- Pall Corp/August Thomsen. During the site visit, not all wells could be located; and the identity of others (mainly in the northern part of the site, but also MW-2P) was ambiguous. Subsequent to the site visit, Earth Tech obtained better maps (with surveyed locations, rather than the sketch figure available on September 7) which may enable some (though not all) of the problems to be resolved. Earth Tech will coordinate with Pall Corp or its engineers in identifying and accessing the monitoring wells. Earth Tech has located prior survey data for many if not all of the monitoring wells located on the Pall/August Thomsen site (based on the 1998 civil survey performed by YEC); if Earth Tech (with Pall Corp's assistance) cannot locate or identify all the monitoring wells, YEC may be called in to stake out the coordinates of the missing well(s).

- City of Glen Cove. A number of wells planned for sampling are located on property believed to be owned or controlled by the City of Glen Cove. These include the wells located in Sea Cliff Avenue; the wells at the Carney Street Wellfield (both the monitoring well and Supply Well No. 21); and "off-site public supply wellfield monitoring wells" (as shown on Figure 3-2, D&B, 2006). Off-site well doublet GC-2D/2S was located during the site visit; however, no effort was made at that time to locate the other five off-site well locations (three doublets and two singlets) tentatively planned for sampling. The locations shown on the currently-available sketch map are very approximate; and NYSDEC indicated that at least one of the wells (GC-1) may never have been found. Earth Tech will coordinate with Glen Cove to locate the off-site public water supply monitoring wells, either through survey data or maps, or with the field assistance of Glen Cove employees. Subsequent conversations with County representatives (NC DOH and NC DPW) indicated that these wells (GC-series) were installed as a joint effort of the two county departments, but are currently administered by NC DPW.

  Inspection and sampling of some of the wells will also require close coordination with Glen Cove, due to their location in the middle of Sea Cliff Avenue. At least part of Sea Cliff Avenue will need to be closed for varying times (depending on the work being performed) for the safety of Earth Tech or subcontractor personnel.

- Associated Draperies. Although not included in the list of monitoring wells in the vicinity provided by NYSDEC (based on D&B, 2006), Earth Tech's review of prior reports (i.e., GZA, 1999) shows that there are two monitoring wells (MW-1H and MW-2H) on the Associated Draperies site (due west of Pall Corp and due north of the former Pass and Seymour/Slater Electric facility). As surveyed data are available for these wells, Earth Tech proposes to include these two wells in the initial monitoring well condition survey. Although these two wells are not included in the preliminary list of wells to be sampled, their usability should be established as a contingency should data from them subsequently be determined to be useful.

While Earth Tech will provide all the logistic effort (including, for example, obtaining the necessary permits from the City of Glen Cove), it is assumed that NYSDEC will obtain the necessary rights of entry to the properties identified by Earth Tech.

2.2.3 Groundwater Investigation

Earth Tech will conduct two sampling events (rounds) to collect samples from each well for VOC analysis. Groundwater elevation measurements will be obtained at each well during the sampling. The two sampling events will be separated by an approximately three-month interval (or greater). In addition, a limited third event will be conducted, collecting samples at the Carney Street Wellfield during the pump test (described below, section 2.2.6).

Prior to sampling, the depth to water in each well will be measured in each well using an electronic water level indicator. The pump will be lowered slowly into the screen zone of the well and positioned at the mid-point of the screened interval (as most of the wells are reported to have 10 ft screened intervals [see Table 2-1], typically this will be at least 5 ft from the bottom of the well). The pump will be operated at a flow rate of between 200 to 500 milliliters per minute (mL/min) with a target flow rate of 300 to 350 mL/min, ideally to stabilize the water level within the well with a maximum draw-down of 0.3 ft. Care will be taken to maintain pump suction.

During purging, pH, specific conductance, temperature, turbidity, dissolved oxygen (DO) and redox potential (Eh) will be monitored at approximate 5-minute intervals. The wells will be considered stabilized and ready for sample collection when indicator parameters have stabilized for three consecutive readings ±0.1 for pH, ±3% for specific conductance, ±10 millivolts for redox potential, ±10% of DO, and turbidity less than 50 NTU. If parameters have not stabilized within two hours, the field geologist will contact the Earth Tech and NYSDEC project managers to discuss how to proceed. Purge water will be managed as discussed in section 2.11.

Groundwater samples will be collected using the lowest sustainable flow rate into the laboratory-supplied, pre-preserved 40-mL vials. Samples will cooled and maintained at approximately 4° C and will be shipped under chain-of-custody for overnight delivery to the laboratory, normally on the day of collection but in no case later than 48 hours after collection.

Appropriate QA/QC procedures will be followed and will include matrix spike samples/matrix spike duplicate (MS/MSD) samples, field duplicates, and trip blanks. Field duplicates and MS/MSD samples will be collected and submitted at a frequency of one per 20 (or fewer) environmental samples. One trip blank (analyte-free water provided by the laboratory) will accompany each shipment of samples to the laboratory for VOC analysis.

Decontamination of the submersible pump used for purging will be performed in accordance with procedures specified in the FAP (section 2.11).

Water level measurements will be collected from all of the wells of the monitoring network identified to be useful and viable during the well inspection survey and all newly installed wells. The water levels will be collected prior to scheduled sampling of the wells and all measurements will include recording the following information:

- Security of well cover and lock
- Condition of surface seal
- Existence of ponded water or fluids
- Diameter of well
- Depth of well (and comparison to as-built well diagrams for discrepancies that could indicate that the well has silted up)
- Water level
- Other pertinent factors (e.g., accessibility)

The existing monitoring wells identified to be useful and viable during the well inspection survey will be purged and sampled. Based on the initial scope of work provided by NYSDEC, the 53 proposed existing wells to be sampled include:

Pall Corp Wells (n = 20)
MW-1P, MW-1PI, MW-1PD, MW-4P, MW-4PI, MW-4PD, MW-5P, MW-5PI, MW-5PD, MW-6P, MW-6PD, MW-10PS, MW-10PI, MW-10PD, MW-11PS, MW-11PI, MW-11PD, MW-13PS, MW-13PI, MW-13PD

Photocircuits Wells (n = 7)
MW-3, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12

City of Glen Cove Wells/Carney Wellfield (?) (n = 3)
MW-1GS, MW-1GI, MW-1GD. [Need to resolve depth/ duplicate listing anomaly during well condition survey or before]

August Thomsen Wells (n = 6)
MW-2A, MW-2AI, MW-2AD, MW-12PS, MW-12PI, MW-12PD [MW-12 cluster on Pall Site]

Public Water Supply Wells (n = 13)
GC-1D, GC-2S, GC-2D, GC-3S, GC-3M, GC-3D, GC-4S, GC-4D, GC-5S, GC-5D, GC-10S, GC-11S, GC-11-D

Sea Cliff Avenue (n = 4)
MW-14PCD, MW-15PCD, MW-16PCI, MW-16PCD [these last two actually on P&S]

These groundwater monitoring wells and others on and in the vicinity of the site are identified on Table 2-1 and shown on Figure 3. Table 2-1 also summarized the available information on the date of installation, screen zone, and diameter of the wells (as provided by NYSDEC), as well as whether or not boring logs, well installation logs, or sampling logs have been located.

2.2.4 New Groundwater Monitoring Well Installation and Sampling - General

Prior to installing the wells, a geophysical survey will be conducted at each location to investigate the presence of buried utilities. Earth Tech will also discuss with NYSDEC the potential need to double- or triple-case wells to prevent contaminant migration between aquifers during drilling and well installation.

The new monitoring wells will be installed using 4¼-inch ID hollow stem augers. If difficulties with running sands are encountered which hinder drilling, potable water or drilling mud may be introduced to maintain a positive hydrostatic head. An overall summary of the estimated well installation and drilling program (based on the specific wells and drilling to be performed, as provided in Sections 2.2.7 through 2.2.10. below) is presented as Table 2-2. Note that the proposal for new monitoring well installation is based on the existing wells being in good condition (i.e., suitable for sampling). If some of the key monitoring wells (especially those along Sea Cliff Avenue) cannot be located or are not in good condition, additional new wells may need to be installed to replace them.

Soil cuttings generated from the boreholes will be logged and documented by a geologist. In addition, a subset (six) of the new wells (see Section 2.2.6) will be logged by collecting split spoon samples at 5-ft intervals. Notes will be kept in both bound field books and boring logs. The Unified Soils Classification System will be used to describe the soil. Cuttings will also be screened for VOCs using an organic vapor analyzer equipped with a photoionization detector (PID).

The monitoring wells will be constructed of 2-inch schedule 40 or schedule 80 0.010-inch slot PVC well screen and threaded, flush joint schedule 40 or 80 PVC casing. Schedule 80 PVC has been selected for its increased strength, due to the depth (over 200 ft bgs in some cases) of the new wells; it is tentatively assumed that all new wells greater than 100 ft bgs will be constructed of schedule 80 PVC. Each well screen will be 10 ft long.

The well screen and riser pipe will be inserted into the hollow stem auger and set at the desired depth. A sand filter pack will be placed into the annular space around the screen to at least 2 ft above the top of the screen. A minimum 2-ft thick bentonite seal will then be placed above the filter pack. The remaining borehole will be filled to just below ground surface with a bentonite/cement grout. A flush-mounted well cover will be installed in a cement pad at ground surface.

Attempts will be made to install all of the wells using the hollow stem auger drilling method. However, since the screen zone for the deep well in the cluster to be installed at the Carney Street Well Field is 210 to 220 ft bgs, this well may need to be constructed using the water rotary drilling method, depending on the drilling conditions encountered during construction of the other wells. If the water rotary method is required, a minimum 6-inch diameter roller bit will be utilized to advance the borehole. (Note that water rotary is preferred over mud rotary; however, mud rotary will the third alternative.) This well will be constructed of 2-inch Schedule 80, 0.010-inch slot PVC well screen and threaded, flush joint PVC casing. The filter pack, bentonite seal, grout and well cover for this well will be installed in the same manner as previously described.

Drilling equipment will be decontaminated before the first use during this project, between boreholes and prior to demobilization using high-pressure steam. Decontamination will be

conducted at a dedicated decontamination pad constructed for this project on the Pall property. Decontamination fluids will be contained for subsequent disposal.

Soil cuttings from all well borings will be containerized in lined and covered roll-off containers for subsequent off-site disposal. The roll-off containers will be staged at the Pall property.

All new monitoring wells will be purged and sampled after installation.

The approximate locations of the proposed new monitoring wells are shown on Figure 4.

2.2.5 Down-Hole Gamma Logging

Although included in the NYSDEC scope of work, Earth Tech does not recommend downhole gamma logging be performed this time. Subsurface conditions will be established based on review of the boring logs for previous borings; and by split spoon sampling and logging of a subset of the new wells to be performed. Split spoon logging is proposed for the following new wells:

- Near the Carney Street Well Field at the new deep well MW-GD2.
- At the northwest corner of the Thomsen August property at new deep well MW-2AD2.
- In the center of the Pall property at deep well MW-4PD2.
- Along Sea Cliff Avenue at new deep well MW-16PD.
- At northern drum storage area on Photocircuits property at new deep well MW-GW4D.
- At the southern property boundary, at new deep well MW-19D.

2.2.6 Hydropunch Sampling and New Well Installation - Photocircuits Property

Hydropunch sampling will be performed on the Photocircuits property in the source area near previous boring 31-GB-04B. Prior to installation of the permanent monitoring well quadruplet near 31-GW-04B (screened at estimated depths of 70, 90, 130 and 160 ft bgs), a complete 5-ft interval profile will be obtained by hydropunching ahead of the casing for the deepest (160 ft) well. The 160-ft well will be installed first. Due to differences in construction methods (including well diameter and length of screened interval), these wells will be installed in accordance with monitoring well specifications. If a proposed remedy requires the installation of extraction or injection wells for a treatment system, they will be installed as part of remedy implementation, not during the RI.

The work plan includes a provision for two additional 160-ft depth hydropunch borings near 31-GW-04B and up to three singlet monitoring wells of depths 150 ft or less, to be installed if the results of the permanent monitoring well installation and the hydropunch borings warrant. Groundwater samples will be taken from the hydropunch borings from the water table to the maximum depth at 20-ft intervals; except that no sample will be collected from the shallow (0-20 ft bgs) interval.

One permanent monitoring well doublet will be installed on the southern boundary of the property (north of the Glen Head Country Club) and screened at 60 and 100 ft bgs. This well will serve as the upgradient or background well.

No new permanent monitoring wells will be installed on the Photocircuits side of Sea Cliff Avenue; assessment of the existing hydraulic controls and migration onto the Pall Corp site will utilize existing wells at both Pall and Photocircuits, and new wells proposed for the Pall Corp site (see Section 2.2.7, below).

The work described above will be coordinated with the work carried out on and downgradient of the Pall property to the extent practicable. Precise locations of the wells will be determined in consultation with the NYSDEC project manager.

2.2.7 New Well Installation - Pall Corp. Property

Four new deep monitoring wells will be installed on the Pall Corp site. Each well will be screened between 145 and 155 ft bgs. The four wells will be located in the vicinity of existing wells MW-4D, MW-12PD, MW-11PD, and MW-2AD.

Five new monitoring wells will be installed on the Pall Corp site along Sea Cliff Avenue to assess the effectiveness of the existing hydraulic controls (on the Photocircuits property) and contaminant migration onto the Pall Corp. The new wells proposed are MW-6PD2 (creating a triplet, along with existing wells MW-6P and MW-6PD); new triplet MW-16PS, 16PI, and 16PD (located along Sea Cliff Avenue between MW-7P and MW-8P); and MW-8PD (creating a triplet with MW-8PS and MW-8PI).

2.2.8 New Well Installation - Carney Street Well Field Property

One permanent monitoring well quadruplet will be installed approximately 75 ft south of the Carney Street well field. The four wells will be screened at approximately 80, 120, 160 and 220 ft bgs. Provision will be made for three sampling events, two of which will be conducted in conjunction with the sampling of the existing wells, and a third to be timed to coincide with a pump test of the Carney Street production well (see Section 2.2.10, below).

2.2.9 Aquifer (Pump) Test and Sampling of the Carney Street Production Well (Well No. 21)

An aquifer (pump) test will be conducted on Well No. 21 of the Carney Street Well Field. The objectives of this test are to determine the capture zone and hydraulic dynamics of Well No. 21, and to determine the groundwater quality of the pumped groundwater. The results of the pump test will be evaluated to assess the viability of future operation of Well No. 21 for VOC plume capture, treatment, and potential use of the treated water for industrial purposes.

The pumping of Well No. 21 and associated discharge will be coordinated with the City of Glen Cove. The pump test will be conducted for up to 48 hours and the well will be pumped at the maximum practical pumping rate at a constant rate. It was reported in historical files that the well had a capacity of 1,400 gallons per minute (gpm); conversations with other knowledgeable parties confirm this rate. The maximum pumping rate will be further confirmed by a review of the available pumping data pertaining to the Carney Street Well Field, if this information can be located. If the maximum pumping rate is not confirmed, a step test will be performed to determine the maximum pumping capacity of well No.21. The 48 hours pumping duration may vary as based upon the on site review of the water level readings collected from the upgradient monitoring wells during the initial phase (first 12 to 24 hours) of the pump test.

Water level measurements will be collected from the production well and selected nearby monitoring wells. The pump test is planned to be performed after the installation of the proposed new monitoring wells and after collecting the first round of groundwater sampling. Water level readings will also be recorded in all the existing and new monitoring wells during this round of groundwater sampling. The information collected during the first round of groundwater sampling will be utilized in selecting the monitoring wells for water level measurements. Water levels during the recovery period will also be collected. The recovery period will be considered complete when the water level has returned to 90 percent of pre-test levels. The water levels will

be collected manually using an electronic water level indicator and electronically by transducers with data logging capacity. The wells requiring transducers will be selected after review of the data from the first round of groundwater sampling.

Background measurements will be collected from selected monitoring wells for a week prior to the pump test. The pump test is proposed to be conducted immediately after the second round of groundwater sampling. Therefore, the Earth Tech personnel performing groundwater sampling can also measure water levels in selected monitoring wells at the specified intervals.

Samples for analysis will be collected of pumped water from Well No. 21 in addition to the four new wells of the cluster to be installed 75 ft to the south (see section 2.2.9). Earth Tech also recommends sampling from one monitoring well cluster near Sea Cliff Avenue (e.g., well cluster MW-8P) to assess the effect of pumping Well No. 21 on the effectiveness of the hydraulic control system at the Photocircuits site. The samples will be collected at the beginning of the pump test and at approximately12-hour intervals thereafter, including a sample when the test is terminated. These samples will be analyzed for TCL VOCs.

The NYSDEC scope of work assumed that the pumped water will be discharged to the Glen Cove sewer system as was reportedly done during previous investigations (apparently referring to the pump test performed in 2000 by consultants to the Glen Cove Water Department). Permission will be obtained from the City of Glen Cove and the pump test will be coordinated with the City. On further investigation, Earth Tech has been unable to confirm the disposition of the water from this test, which was run for eight days in January, 2000. Earth Tech does note that there may some difficulty in the disposal of this water, due at least in part to the fact that Nassau County's stormwater management program (under a general SPDES permit) did not begin until 2003. The issue of disposal of the water from the proposed aquifer pumping test is discussed further under Investigation-Derived Waste Management (section 2.2.11), below.

2.2.10 Utility Clearance/Geophysical Survey

Prior to any intrusive work (i.e., advancement of borings, including hydropunch), a utility clearance survey will be performed; and public utilities and carries may be contacted through the New York DIG SAFE CALL CENTER at 1-800-272-1000. This work will be performed by a subcontractor to Earth Tech.

2.2.11 Investigation-Derived Waste Management

Investigation-derived wastes (IDW) generated during this project will fall into three general categories, discussed in greater detail below: drill cuttings (soil); aqueous wastes (from well development and purging, and the pump test); and miscellaneous solid waste (personnel protective equipment and general trash).

2.2.11.1 Drill Cuttings / Soils

A significant amount of investigation-derived waste (IDW), principally drill cutting from new monitoring well borings, is expected to be generated form this project. Based on available data, it is not expected that this material will be subject to regulation as hazardous waste.

Drill cuttings will be staged temporarily at the boring location, and subsequently transferred to a roll-off container (20 cubic yard) in the Pall Corporation parking lot. Earth Tech will obtain the roll-off from a vendor. The containers will be covered (e.g., with a non-leaking tarp) to prevent water intrusion into the containerized cuttings.

While Earth Tech will assist NYSDEC in the characterization and in coordinating the disposal of this material, Earth Tech cannot be identified as the generator of the waste and will only be acting on behalf of (as the agent of) the generator, NYSDEC.

Based on an estimated 2860 ft of drilling, and assuming that the 4¼ inch hollow stem augers will generate a 9-inch annulus (including an allowance for sloughing/caving in), it is estimated that the *in situ* volume of cuttings will be about 1260 cubic feet (47 CY). Allowing for a swell factor of 1.3, about three or four 20-CY roll-off containers will be needed.

2.2.11.2 Aqueous Waste

Aqueous waste will be generated from well development (including development of new wells, and possible re-development of existing wells), well purging prior to sampling, and also during the pump test (see Section 2.2.10, above). Options or assumptions relating to the disposition of these various aqueous waste streams are discussed below.

Well Development Water

Aqueous waste will be generated from well development (including development of new wells, and possible re-development of existing wells). It is assumed that aqueous wastes generated from these activities will be disposed in the City of Glen Cove storm sewer system; this will be verified and permission obtained from Glen Cove prior to proceeding. With the consent and cooperation of the site owner, it may also be possible to discharge of development water from new wells on the Photocircuits site through Photocircuits' existing permit.

Well Purging Water

Aqueous waste will be generated from well purging prior to sampling. It is assumed that aqueous wastes generated from these activities will be disposed in the City of Glen Cove storm sewer system; this will be verified and permission obtained from Glen Cove prior to proceeding. Conversations with Nassau County DPW officials knowledgeable of the County's well sampling program indicated that purge water from the county's sampling effort is allowed to percolate back into the ground. This option may also be viable, although the contaminant concentrations in the wells in the County's network are typically low and not representative of the concentrations which may be present in at least some of the monitoring wells to be sampled for this RI. (As with development water, purge water from sampling wells on Photocircuits site could potentially be discharged under its existing permit.)

Decontamination Water

A limited amount of decontamination water will be generated from the cleaning of drill equipment and also smaller sampling equipment during the course of this RI. This water will be drummed and sampled for disposal parameters (e.g., RCRA VOCs).

Aquifer Pump Test Water

As discussed above (section 2.2.9), an aquifer pump test is proposed, lasting 24 to 48 hours. Pumping at the reported capacity of Well No. 21, 1400 gpm, will generate about 2,000,000 (two million) gallons of water per day. The three potentially feasible options identified for disposal of this water are (a) direct disposal to Glen Cove Creek, a few hundred feet west of Well No. 21; (b) disposal to the storm sewer system; and (c) disposal to the sanitary sewer system. Each of these options has drawbacks, as discussed below.

- Disposal to Glen Cove Creek. To dispose of the pumping test water to the creek without a permit would require that the discharged water meet the applicable ambient water quality criteria without treatment (Class C for Glen Cove Creek). The concentrations of volatile organic compounds reported in the final effluent from the previous (2000) pump test would exceed the applicable criteria; therefore, a SPDES permit specific to this discharge would likely be required. Earth Tech is currently in the process of identifying the steps necessary to obtain a permit for this discharge, and also as to whether or not a permit would likely be granted. In addition to the SPDES permit, if there are no existing discharge structures in Glen Cove Creek through which the pump test water may be directed, installation of a new discharge point (even if only temporary in nature) may require a freshwater wetlands permit. The applicability of this concern will be addressed during the ongoing discussions with the NYSDEC Region 1 Office of Environmental Permits regarding the SPDES permit.
- Disposal to storm sewer system. Earth Tech is in the process of evaluating this option concurrent with the direct disposal to Glen Cove Creek option. As with the direct disposal option, a SPDES permit will likely be necessary as the pump test water is unlikely to meet the ambient water quality criteria for the storm sewer's ultimate receiving body. This option, however, eliminates concerns regarding the potential need for wetlands permits, as all water would be discharged via existing structures.
- Disposal to Sanitary Sewer System. The City of Glen Cove has its own publicly-owned treatment works (POTW), which is operated by Severn Trent. Earth Tech contacted the operator, who indicated that the POTW may have the capacity to handle the proposed pump test discharge, but that the city's consultant (Dvirka and Bartilucci [D&B]) must first determine if the proposed discharge meets the city's water quality criteria. Earth Tech was provided with the POTW's part 701 acceptance criteria; and after having an informal discussion with D&B, it appears that the pump test water would meet the chemical contamination criteria (although further documentation and data would need to be provided). However, the acceptance criteria also include a ban on 'slugs'; it has not yet been determined if the proposed short-term discharge would essentially create a 'slug' of clean water which could adversely affect the POTW's biological treatment system.

2.2.11.3 Miscellaneous Solid Waste

Miscellaneous solid waste includes used personnel protective equipment (e.g., gloves) as well as other trash (packaging material, food wastes, general trash). Earth Tech will obtain a small roll-off container for disposal of these items as non-hazardous solid waste. (Note that this may not be necessary if appropriate arrangements can be made with site owner representatives for disposal of Earth Tech's general trash on-site.)

2.3 TASK 3 – REMEDIAL INVESTIGATION REPORT

A draft Remedial Investigation Report will be prepared and submitted to the NYSDEC for review. Comments received on the draft report will be incorporated into the final Remedial Investigation Report. Earth Tech personnel (project manager and lead geologist) will (if requested) attend a public meeting with the NYSDEC to present the findings of the investigation. Earth Tech's proposed citizen participation program, including its role in public meetings, is presented in greater detail section 2.5, below. (The cost estimate for this work assignment assumes that Earth Tech will provide support for two meetings, one after the RI and one after the FS.)

The report will present figures and maps illustrating the locations of all sampling points, including monitoring wells, as well as pertinent analytical results. Cross sections will be prepared, if necessary, to depict the geologic and hydrogeologic characteristics of the site, as well as pertinent hydraulic and analytical information. Groundwater contour maps and flow diagrams will be prepared for hydrogeologic units, to depict groundwater flow characteristics with and without Well No. 21 pumping.

The information and sample results obtained during the Remedial Investigation program will be used to characterize the study area, including determination of the nature, extent and sources of contamination, and groundwater flow and quality during pumping of Well No. 21. This information, together with the documentation of all field procedures undertaken, including sampling, testing, and quality assurance/quality control, will be included in the Remedial Investigation Report. Analytical results will be presented in a spreadsheet format and compared to the New York State Class GA groundwater standards and guidance values.

In addition to hard copies, Earth Tech will provide electronic files to the NYSDEC in Adobe Acrobat (.pdf) format. Preliminary reports and supporting documents for the final reports must also be delivered to the NYSDEC. These preliminary and supporting documents must contain a cover page indicating that they are not the finalized documents and state the percent of work this document represents and the amount of work that remains. At the time of Work Assignment completion, Earth Tech will submit all final documents and data that were generated during the Work Assignment to the NYSDEC. If requested by NYSDEC, Earth Tech will submit a computer-readable magnetic media copy in American Standard Code for Information Interchange (ASCII) format for final reports, specifications, or data generated under this contract.

At the time of completion of the Work Assignment services, Earth Tech will provide NYSDEC with the original copies, two reproducible copies, plus additional copies, of all final plans, drawings, specifications, computations, designs, construction data, reports, record drawings, and all other documents and data pertaining to the work which is the subject of this Work Assignment, to the extent that the information has not already been furnished.

2.4 TASK 4 – FEASIBILITY STUDY

A feasibility study (FS) will be conducted to identify and evaluate remediation technologies, and recommend remedial action. The FS will be prepared after the Remedial Investigation Report has been finalized. As part of the FS, presumptive remedies will be evaluated including groundwater extraction and treatment, air sparging, no further action, and long-term monitoring. If applicable,

new emerging technologies not identified in the presumptive remedies for the Site will also be evaluated as part of the FS. The FS will include development, preliminary screening and detailed evaluation of remediation alternatives. Although presumptive remedies identified by NYSDEC will be evaluated, the FS will be complete and include all the steps required by both the federal CERCLA program and NYSDEC.

A draft Feasibility Study Report will be prepared and submitted to the NYSDEC for review. Comments received on the draft report will be incorporated into the final Feasibility Study Report. Earth Tech will plan to attend a public meeting with the NYSDEC to provide support for presentation of the Proposed Remedial Action Plan (PRAP).

2.5 CITIZEN PARTICIPATION PLAN

Although the citizen participation program is not a separate, standalone task, it is addressed separately in this work plan as the extent of Earth Tech's involvement is entirely at the discretion of NYSDEC. However, based on Earth Tech's experience in supporting NYSDEC as well as other state and federal environmental agencies, the scope of Earth Tech's proposed involvement is summarized below. This scope is based on the NYSDEC Citizen Participation Guidebook (undated; circa 1997).

The citizen participation portion of the RI/FS is very straightforward. Earth Tech's base citizen participation plan (CPP) will include the fundamental requirements for outreach associated with the RI/FS process.

Based on existing information we assume NYSDEC has for this geographic area, we will develop (and maintain) lists of elected officials, affected and/or interested parties, and NYSDEC contacts. In addition to incorporating them into the CPP, we anticipate that these lists will be the project mailing lists. We will update these lists as needed based on evidence of interest by members of the public, sign-in sheets from the initial public meeting, and individual requests for inclusion that are received during the project.

Also using existing information from NYSDEC, Earth Tech will establish or update information repositories to be sure the materials there are current. We will maintain these repositories periodically throughout the project, and for as long as NYSDEC requires them to be open after the ROD.

The CPP we will develop will include site background and project history, a description of the general geographic and demographic area, recommended community outreach activities, lists of interested parties/elected officials, relevant graphics, and appropriate appendices if there are any. At present we anticipate an initial public information session at the project's outset. We will run this meeting using a community-friendly open house format, where a series of display stations will replace the traditional and podium-style presentation; we have found the public is frequently put off by the "us vs. them" tone of a podium-style presentation and recommend the open house format routinely to our clients.

We anticipate four display stations, each explaining one aspect of the project: (1) the RI/FS process, (2) background and history, (3) specific technical activities, and (4) the citizen participation process. This last display will have contact information and there will be opportunities at this station for people to comment. Each station will be staffed by one or two (preferably two) subject matter experts.

Earth Tech will prepare the meeting materials, including the displays and fact sheets that accompany the displays (one per station), based on risk communication principles. Risk communication is not about communicating risk, though it could be. It is a communication tool for developing written and spoken messages that audiences understand, among other things. Although we do not expect this to be the case with this project, risk communication techniques are useful in diffusing hostility. We will prepare newspaper advertisements as required and publish the meeting notice.

Prior to the public meetings, Earth Tech will develop a list of questions we anticipate will come from the public and will work with NYSDEC to develop appropriate answers. Before the first meeting, the Earth Tech CP coordinator will review the principles of risk communication with the team that will be on the floor at the meetings. Unless requested to add personnel by NYSDEC, Earth Tech will supply four professionals for the meetings: the project manager, the CP coordinator, and two technical specialists.

Costs and level-of-effort for the CP activities are included within the applicable tasks. Specifically, preparation of the CPP is included in Task 1; participation in the post-RI public meeting is included in Task 3; and participation in the post-FS/PRAP meeting is included in Task 4.

3.0 SCHEDULE

This Work Assignment will be completed within 18 months of Earth Tech's acceptance of the Work Assignment. A tentative schedule is provided as Figure 5. The schedule will be updated periodically to reflect the actual progress of the work and realistic time frames for completion.

Due to the advantage of conducting the overflight (aerial photography) for base map generation subsequent to leaves falling but prior to snowfall, Earth Tech also requests that NYSDEC consider authorizing the overflight task while overall review of the remainder of the cost and technical proposal is still underway. Otherwise, the base map preparation may be delayed until snow melt in the spring.

4.0 STAFFING PLAN

An organizational chart is provided as Figure 6. Key personnel and contact information are provided below.

Name	Role	Organization	Address	Phone	email
Mike Thiagaram	Program Manager	Earth Tech	300 Broadacres Drive, Bloomfield, NJ	973-337-4242	Mike.thiagaram@earthtech.com
Allen Burton	Project Manager	Earth Tech	300 Broadacres Drive, Bloomfield, NJ	973-337-4214	Allen.burton@earthtech.com
Paul Kareth	Geologist/ Field Team Leader	Earth Tech	300 Broadacres Drive, Bloomfield, NJ	973-337-4215	paul.kareth@earthtech.com
Chris Taylor	Chemical Quality Assurance	Earth Tech	487 Shoddy Hollow Road Middletown, NY 10940	845-386-4705	enviroqa@hvc.rr.com

Ed Chen	Subcontractor Project Mgr	YEC	612 Corporate Way, Suite 4M Valley Cottage, NY 10989	845-268-3203	edchen.yec@verizon.net
TBD	Lab Director	Lab - TBD			
TBD	Data Validator	TBD-			

5.0 SUBCONTRACTING PLAN / M/WBE UTILIZATION PLAN

Earth Tech has identified the following activities as likely to be subcontracted.

- Surveying, including preparation of the site base map
- Drilling and monitoring well installation (including well development and construction of decontamination pad, and hydropunch sampling if requested)
- Hydropunch boring and sampling (could be the same subcontractor as the driller)
- Traffic Control (during work on Sea Cliff Avenue, and other active roadway right-of-way areas if needed)
- Utility clearance (geophysical survey)
- Laboratory analysis of groundwater samples (by a NYSDOH ELAP-certified laboratory)
- Data validation/data usability summary reports

Third-party vendors may also be utilized for solid waste containers (roll-offs); temporary facilities (sanitary facilities and an office trailer, if needed), and field equipment rental.

For all the subcontracts and vendors needed, Earth Tech will ascertain that qualified minority and women-owned business firms are solicited, and will make a good-faith effort to meet the contractual goal of 15 percent minority business and 5 percent women-owned business participation. The New York State Department of Economic Development Division of Minority and Women's Business Development Empire State Development (ESD) web site will be used as an aid in identifying MBE and WBE firms. Preference will be given to such firms, to the extent allowed by NYSDEC contracting guidelines. However, as subcontracts are bid competitively, and only well-qualified firms are solicited, there is no assurance that Earth Tech's good-faith efforts will result in the specific MBE/WBE targets being achieved.

6.0 PROJECT BUDGET

A summary of the proposed project level of effort and budget is presented in the 2.11 schedules, attached.

Earth Tech is aware that the proposed budget exceeds NYSDEC's original estimate for the overall project, and also for the project planning (Task 1). While the initial NYSDEC estimate is appropriate for many sites, planning for the Photocircuits/Pall Corp Deep Groundwater OU2 RI is essentially three sites (Pall, Photocircuits, and the Carney Street Wellfield; a fourth site if the Pass and Seymour Site, which is also a separately-listed NYSDEC Class 2 Registry Site); and coordination with multiple agencies City and County agencies (Glen Cove DPW; Glen Cove Water Department, as well as their consultants; and likely ultimately public safety organization) (multiple departments and offices within Nassau County DPW, including its consultants, and Nassau County DOH) not directly involved but whose cooperation (and records) are important to the proper planning and execution of the project. However, Earth Tech believes that a careful

attention to the planning and execution of this project are critical to ensuring that the field work and data generated are defensible and definitive, and can withstand competing claims of various interested parties (including PRPs) who have a vested interested in the outcome and recommendations of the RI/FS.

As noted above (Section 3.0), Earth Tech requests that NYSDEC consider authorizing the subcontractor to perform the aerial photography prior to completion of the overall review of the cost and technical approach provided herein, as the aerial photography sub-task is time-sensitive (should be conducted when the leaves are off the trees but snow is not on the ground).

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TABLE 2-1
Photocircuits / Pall Corp. Site
Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Pall Corporation	MW-1P	1/21/1992	5-15	No	4	
	MW-1PI	3/10/1999	41-51	48.10	2	
	MW-1PD	3/11/1999	90-100	90.61	2	
	MW-2P	1/22/1992	4-14 ,	No	4	
	MW-3P	1/21/1992	3-14	15.21	4	
	MW-4P	1/20/1992	13-23	23.80	4	
	MW-4PI	3/12/1999	45-55	48.35	2	
	MW-4PD	3/16/1999	91-101	101.50	2	
	MW-5P	1/20/1992	3-13	13.30	4	
	MW-5PI	3/17/1999	40-50	48.35	2	
	MW-5PD	3/17/1999	90-100 +5	98.82	2	Artesian 3/06
	MW-6P	8/14/1992	50-60	59.88	4	
	MW-6PD	3/9/1999	90-100	100.95	2	
	MW-7P	11/18/1996	3-18	17.55	4	
	MW-8PS	3/25/1999	5-15 +5	13.88	2	
	MW-8PI	3/25/1999	40-50	49.79	2	
	MW-10PS	3/19/1999	5-15 +2	15.16	2	
	MW-10PI	3/19/1999	40-50 +5	50.95	2	
	MW-10PD	3/22/1999	90-100 +5	96.59	2	Artesian 3/06
	MW-11PS	8/17/1999	5-15	11.78	2	
	MW-11PI	8/17/1999	40-50	49.95	2	
	MW-11PD	8/16/1999	85-95	96.59	2	Artesian 3/06
	MW-13-PS	9/19/1999	5-15	14.65	2	
	MW-13PI	8/19/1999	40-50	50.23	2	
	MW-13PD	8/18/1999	85-95	94.70	2	
	MW-17PS	Recent?		28.75	4	Data from Apex
	MW-17PI	Recent?		54.60	4	Data from Apex
	MW-18PS	Recent?		26.20	4	Data from Apex
	MW-18PI	Recent?		56.40	4	Data from Apex
	MW-19PS	Recent?		26.20	4	Data from Apex
	MW-19PI	Recent?		50.23	4	Data from Apex
Pall Corporation Pilot Test Wells	PT-MW-1S	Recent		14.15	4	Data from Apex
	PT-MW-1I	Recent		55.55	4	Data from Apex
	PT-MW-2S	Recent		14.39	4	Data from Apex
	PT-MW-2I	Recent		55.54	4	Data from Apex
	PT-MW-3S	Recent		12.09	4	Data from Apex
	PT-MW-3I	Recent		56.42	4	Data from Apex
	PT-MW-4S	Recent		14.39	4	Data from Apex
	PT-MW-41	Recent		55.54	4	Data from Apex
	PT-MW-5S	Recent		14.35	4	Data from Apex
	PT-MW-51	Recent		56.60	4	Data from Apex
	PT-MW-6S	Recent		14.32	4	Data from Apex
	PT-MW-61	Recent		54.49	4	Data from Apex

TABLE 2-1
Photocircuits / Pall Corp. Site
Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
August Thomsen	MW-1A	1/23/1992	3-13	12.02	4	
	MW-2A	1/23/1992	3-13	13.05	4	
	MW-2AI	3/23/1999	40-50	49.85	2	Artesian 3/06
	MW-2AD	3/22/1999	80-90 +5	100.25	2	Artesian 3/06
	MW-12PS	8/23/1999	5-15	14.27	2	
	MW-12-PI	8/23/1999	40-50	49.65	2	
	MW-12PD	8/20/1999	85-95	100.70	2	Artesian 3/06
Photocircuits	MW-1	5/12/1987	15-25	No	2	
	MW-2	5/14/1987	10-25*	No	2	
	MW-3	5/13/1987	10-20	No	2	
	MW-4	5/14/1987	14-24	No	2	
	MW-5	5/20/1987	90-100	No	2	
	MW-6	5/13/1987	5.5-15.5	No	2	
	MW-7	8/30/1988	11-26	No	2?	
	MW-8	8/25/1988	155-170	No	2	
	MW-9	8/10/1988	10-25	No	2	
	MW-10	8/12/1988	115-130	No	2	
	MW-11	8/17/1988	160-175	No	2	
	MW-12	10/14/1999	40-50	No	4	
	MW-13	10/15/1999	40-50	No	4	
	MW-14	10/19/1999	45-45	No	4	
Pass & Seymour (Slater Elec.)	MW-1S	1/27/1992	6-21	No	4	
	MW-2S	1/27/1992	6-21	No	4	
	MW-3S	1/27/1992	5-20	No	4	
	MW-4S ***	4/22/1998	4-14	No	4	
Nassua County?	NC-WELL	NA	NA	No	NA	
Sea Cliff Avenue	MW-14PCS	UNK	UNK	23.20	4	Data from Apex
	MW-14PCI	UNK	UNK	49.95	2	Data from Apex
	MW-14PCD	1/4/2000	85-95	90.36	2	
	MW-15PCD	2/22/2000	90-100	99.00	2	
	MW-16PCI	1/6/2000	40-50	49.95	2	
	MW-16PCD	1/6/2000	85-95	96.80	2	
Associated Draperies	MW-1H	Pre-1998	7-27	No	2 or 4	
	MW-2H	Pre-1998	7-27	No	2 or 4	
	MW-1M	NA	19-34	No	2	
Carney Street Well Field	N-3466	NA	148-173	No	NA	
	N-8326 (No. 21)	NA	120-165	No	NA	
	N-8327	NA	115-165	No	NA	
	MW-1GS	NA	TD=23.75	See GC	NA	Duplicate listing?
	MW-1GI	NA	TD=113.5	See GC	NA	Duplicate listing?
	MW-1GD	NA	TD=205	See GC	NA	Duplicate listing?

TABLE 2-1
Photocircuits / Pall Corp. Site
Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
City of Glen Cove	MW-1GS	1/17/2000	5-15	15.13	2 (A)	
	MW-1GI	1/18/2000	40-50	50.15	2 (A)	
	MW-1GD	1/18/2000	85-95	95.00	2 (A)	
	MW-2GS	9/7/1999	5-15	13.90	2 (A)	
	MW-2GI	9/7/1999	40-50	49.65	2 (A)	Artesian 3/06
	MW-2GD	9/7/1999	90-100	NR	2 (A)	Artesian 3/06
Public Supply Well Field Monitoring Wells	GC-1S	NA	19-39	No	NA	
	GC-1D	NA	175-195	No	NA	
	GC-2S	NA	19-39	40.42	NA	
	GC-2D	NA	188-208	216.70	NA	
	GC-3S	NA	4-24	23.53	NA	
	GC-3M	NA	94-114	116.15	NA	
	GC-3D	NA	180-200	203.80	NA	
	GC-4S	NA	34-54	55.45	NA	
	GC-4D	NA	200-220	225.25	NA	
	GC-5S	NA	85-105	115.70	NA	
	GC-5D	NA	234-254	265.60	NA	
	GC-6S	NA	130-150	No	NA	
	GC-6D	NA	255-275	No	NA	
	GC-7S	NA	80-100	No	NA	
	GC-8S	NA	86-106	No	NA	
	GC-8D	NA	169-189	No	NA	
	GC-9S	NA	40-60	113.34	NA	Depth anomaly
	GC-10S	NA	20-40	No	NA	
	GC-11S	NA	95-115	No	NA	
	GC-11D	NA	210-230	No	NA	
	GC-WP1	NA	5-10	No	NA	
Nassau County DPW GW Monitoring Wells	G-4 (N01152)	4/21/1965	125-130	No	4	(Screen 127-130.4)
	G-1A (N05250)	3/8/1967	96-101	No	1.25	
	G-3A (N09670)	4/4/1979	37.25-42.25	No	2	
	SC-2 (N11671)	3/19/1990	19.3-24.3	No	4	Glen Head
	SC-5 (N11675)	4/4/1990	23-28	No	4	Sea Cliff
	SC-7 (N11777)	9/25/1990	68-78	No	4	Sea Cliff

PT = Well to be sampled during pump test only.
Y (Pall) = based on Figure 3-1, this well actually on Pall Corp site
Y (P&S) = based on Figure 3-1, this well actually on Pass and Seymour site.
Y (SCA) = based on Figure 3-1, this well actually on Sea Cliff Avenue.
Y(GZA) = found on figure in GZA FRI report (1999) but not on D&B figures.
* = Well IDs MW-1GS, 1-GI, and 1-GD listed twice on table but shown only once on Figure 3-1; DB Table 4-1 lists Carney St Wells MW-GD1, GD2, GD3, and GD4.
** = Only GC-1 shown on Figure 3-2 (singlet, not GC-1S/1D doublet).
*** = MW-4S shown on figure 3-1 but not on vicinity well table; well log in McLaren-Hart RI, 9/28/98
Boring logs from Enviro-Science except CAR by C A Rich; FDG by Fluor Daniel GTI. Logs for county DPW wells requested but not yet received.
Highlighted data is anomalous (well depth from Enviro-Science sampling log does not match reported well depth).

TABLE 2-2
Photocircuits / Pall Corp. Site
List of Existing Monitoring Wells Included in the Sampling Program

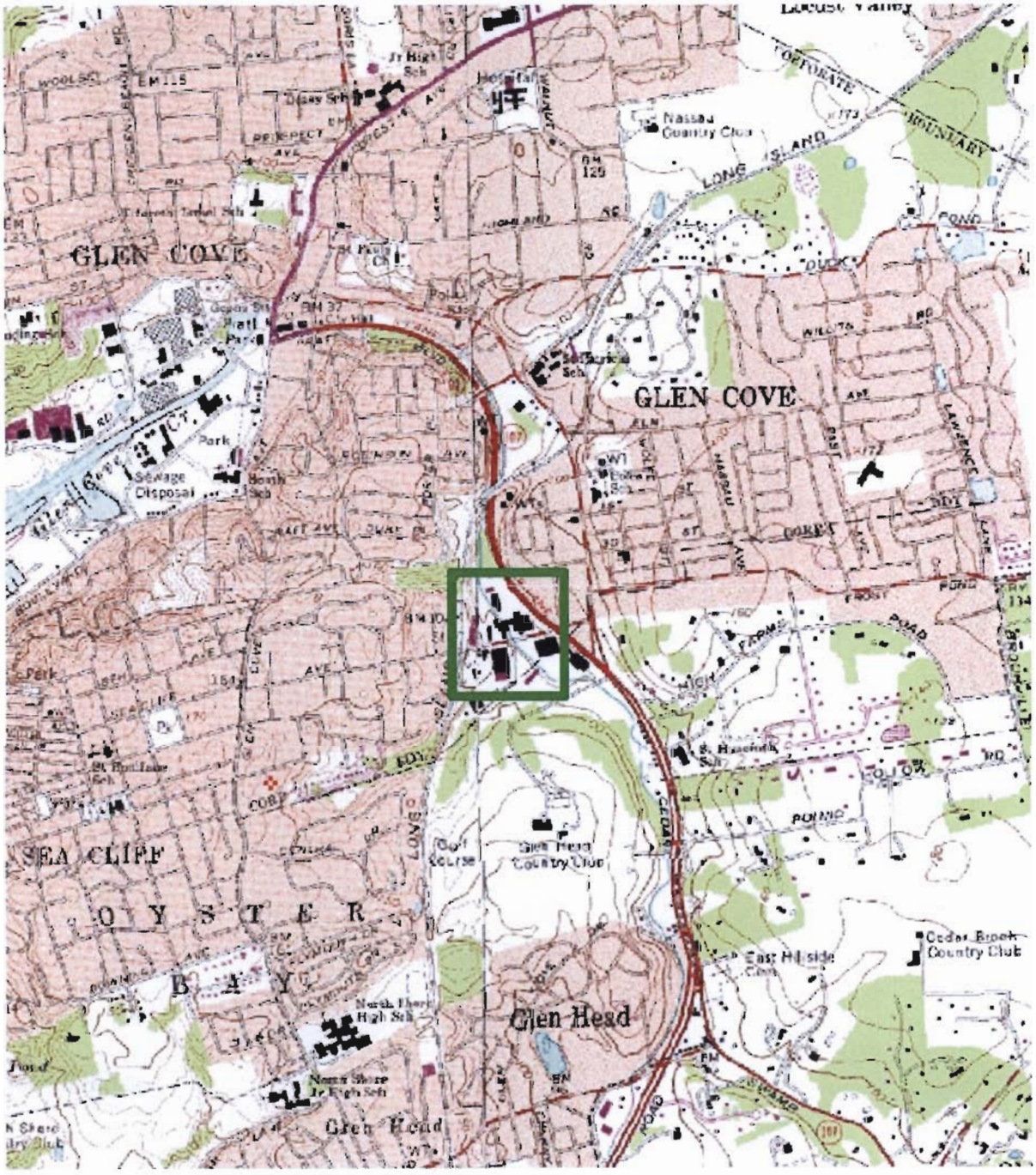
Existing Monitoring Well Construction Details						
Site/Property	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Pall Corporation	MW-1P	1/21/1992	5-15	No	4	
	MW-1PI	3/10/1999	41-51	48.10	2	
	MW-1PD	3/11/1999	90-100	90.61	2	
	MW-4P	1/20/1992	13-23	23.80	4	
	MW-4PI	3/12/1999	45-55	48.35	2	
	MW-4PD	3/16/1999	91-101	101.50	2	
	MW-5P	1/20/1992	3-13	13.30	4	
	MW-5PI	3/17/1999	40-50	48.35	2	
	MW-5PD	3/17/1999	90-100 +5	98.82	2	Artesian 3/06
	MW-6P	8/14/1992	50-60	59.88	4	
	MW-6PD	3/9/1999	90-100	100.95	2	
	MW-10PS	3/19/1999	5-15 +2	15.16	2	
	MW-10PI	3/19/1999	40-50 +5	50.95	2	
	MW-10PD	3/22/1999	90-100 +5	96.59	2	Artesian 3/06
	MW-11PS	8/17/1999	5-15	11.78	2	
	MW-11PI	8/17/1999	40-50	49.95	2	
	MW-11PD	8/16/1999	85-95	96.59	2	Artesian 3/06
	MW-13-PS	9/19/1999	5-15	14.65	2	
	MW-13PI	8/19/1999	40-50	50.23	2	
	MW-13PD	8/18/1999	85-95	94.70	2	
August Thomsen	MW-2A	1/23/1992	3-13	13.05	4	
	MW-2AI	3/23/1999	40-50	49.85	2	Artesian 3/06
	MW-2AD	3/22/1999	80-90 +5	100.25	2	Artesian 3/06
	MW-12PS	8/23/1999	5-15	14.27	2	
	MW-12-PI	8/23/1999	40-50	49.65	2	
	MW-12PD	8/20/1999	85-95	100.70	2	Artesian 3/06
Photocircuits	MW-3	5/13/1987	10-20	No	2	
	MW-7	8/30/1988	11-26	No	2?	
	MW-8	8/25/1988	155-170	No	2	
	MW-9	8/10/1988	10-25	No	2	
	MW-10	8/12/1988	115-130	No	2	
	MW-11	8/17/1988	160-175	No	2	
	MW-12	10/14/1999	40-50	No	4	
Sea Cliff Avenue	MW-14PCD	1/4/2000	85-95	90.36	2	
	MW-15PCD	2/22/2000	90-100	99.00	2	
	MW-16PCI	1/6/2000	40-50	49.95	2	
	MW-16PCD	1/6/2000	85-95	96.80	2	
Carney Street Well Field	MW-1GS	NA	TD=23.75	TBC[2]	NA	Depth uncertain
	MW-1GI	NA	TD=113.5	TBC[2]	NA	Depth uncertain
	MW-1GD	NA	TD=205	TBC[2]	NA	Depth uncertain

TABLE 2-2
Photocircuits / Pall Corp. Site
List of Existing Monitoring Wells Included in the Sampling Program

Existing Monitoring Well Construction Details						
Site/Property	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Public Supply Well Field Monitoring Wells	GC-1D	NA	175-195	No	NA	
	GC-2S	NA	19-39	40.42	NA	
	GC-2D	NA	188-208	216.70	NA	
	GC-3S	NA	4-24	23.53	NA	
	GC-3M	NA	94-114	116.15	NA	
	GC-3D	NA	180-200	203.80	NA	
	GC-4S	NA	34-54	55.45	NA	
	GC-4D	NA	200-220	225.25	NA	
	GC-5S	NA	85-105	115.70	NA	
	GC-5D	NA	234-254	265.60	NA	
	GC-10S	NA	20-40	No	NA	
	GC-11S	NA	95-115	No	NA	
	GC-11D	NA	210-230	No	NA	

Notes:
1. List of wells to be sampled will be updated and modified after completion of the well survey task.
2. To be checked during well survey; available well information is contradictory; well logs not yet acquired.

TD = Total Depth
"Well TD" column based on data reported in Apex report (May, 2006).



LEGEND

SITE LOCATION

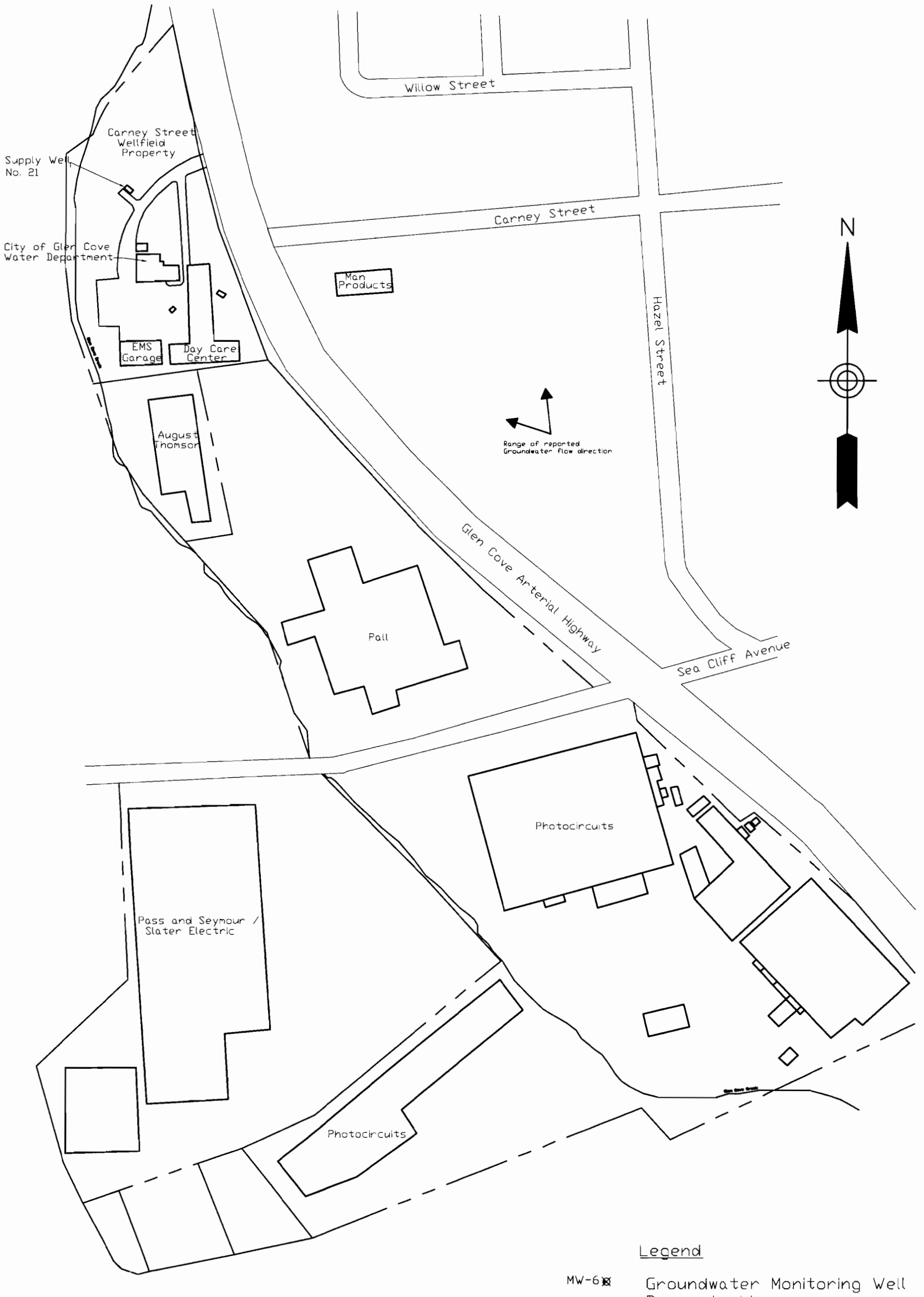
0.2 0 0.2 0.4

GRAPHIC SCALE

EarthTech

New York State Department of Environmental Conservation

DESIGNED BY: RS	Photocircuits / Pall Corp. GLEN COVE, N.Y.		
DRAWN BY: RS	SITE LOCATION PLAN		
CHECKED BY: AB			
SUBMITTED BY: AB	DATE: SEPTEMBER 2006	SCALE: AS SHOWN	DRAWING NO.: FIGURE 1



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE:
SITE PLAN

DRAWN BY: MC
CHECKED BY: KS
SCALE: As Shown
DATE: 11/20/06
PROJECT NO. 95636
DRAWING NO. ***FIGURE 2***

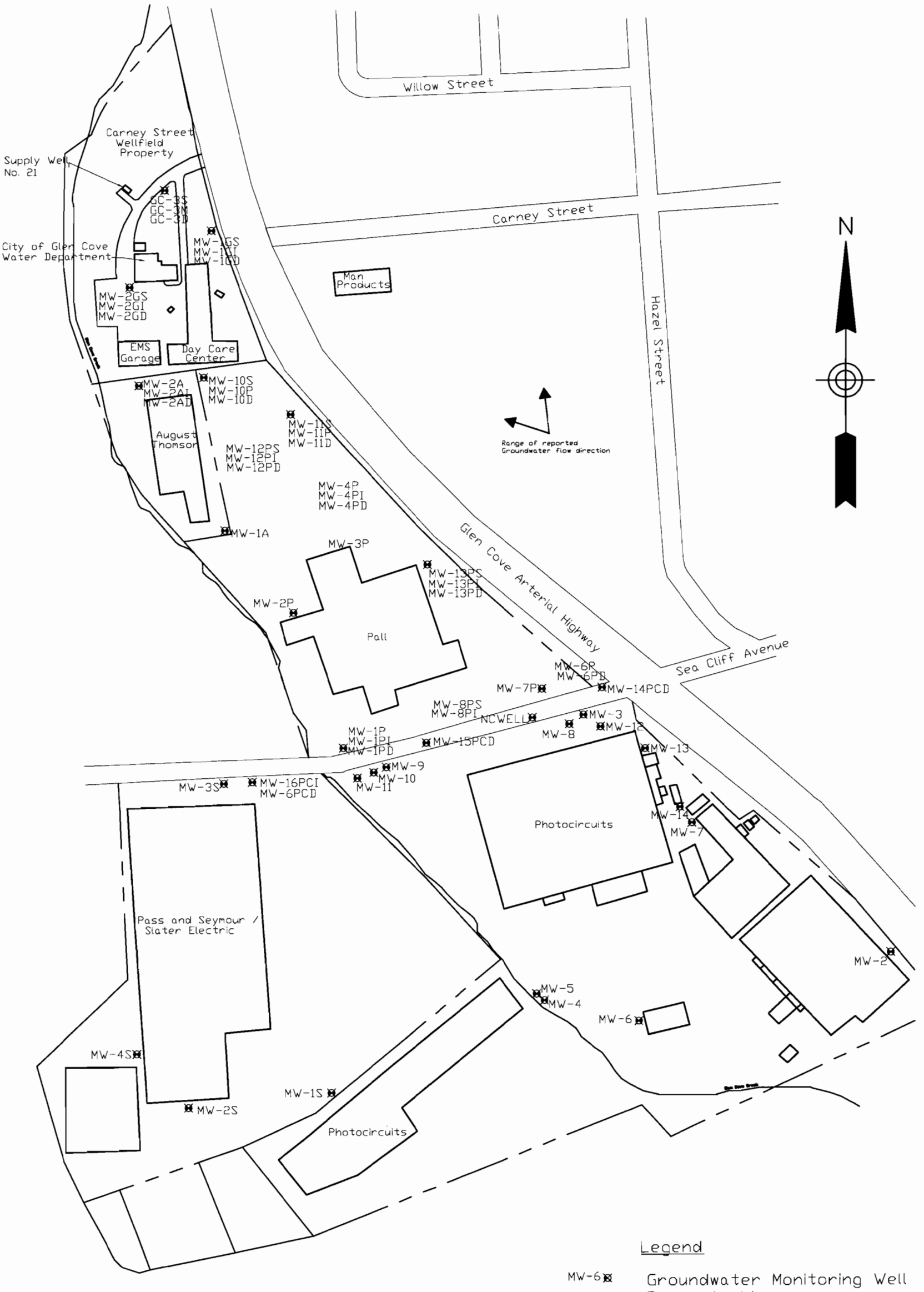
PROJECT:
Photocircuits and Pall Corp.
Glen Cove, New York

CLIENT:
NYSDEC
Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE:
Existing Monitoring Wells

DRAWN BY:	MC
CHECKED BY:	KS
SCALE:	As Shown
DATE:	11/20/06
PROJECT NO.	95636
DRAWING NO.	***FIGURE 3***

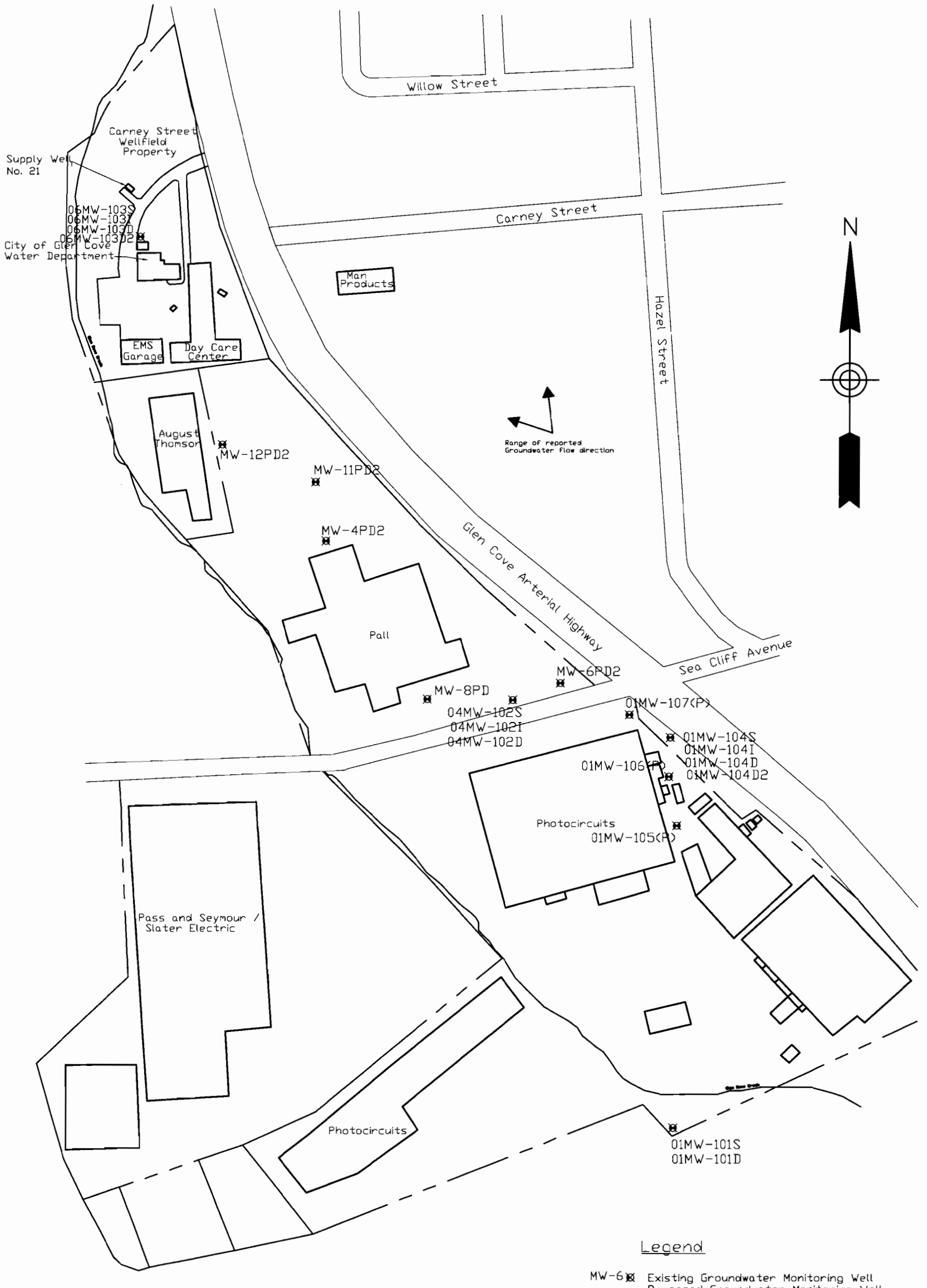
PROJECT:
Photocircuits and Pall Corp.
Glen Cove, New York

CLIENT:
NYSDEC
Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE:
Proposed Monitoring Well Locations

DRAWN BY: MC
CHECKED BY: KS
SCALE: As Shown
DATE: 11/20/06
PROJECT NO. 95636
DRAWING NO. ***FIGURE 4***

PROJECT:
Photocircuits and Pall Corp.
Glen Cove, New York

CLIENT:
NYSDEC
Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH

FIGURE 5
PROJECT SCHEDULE
PHOTOCIRCUITS / PALL CORP OU2 (DEEP GROUNDWATER) RI/FS
WORK ASSIGNMENT No. D004436-04

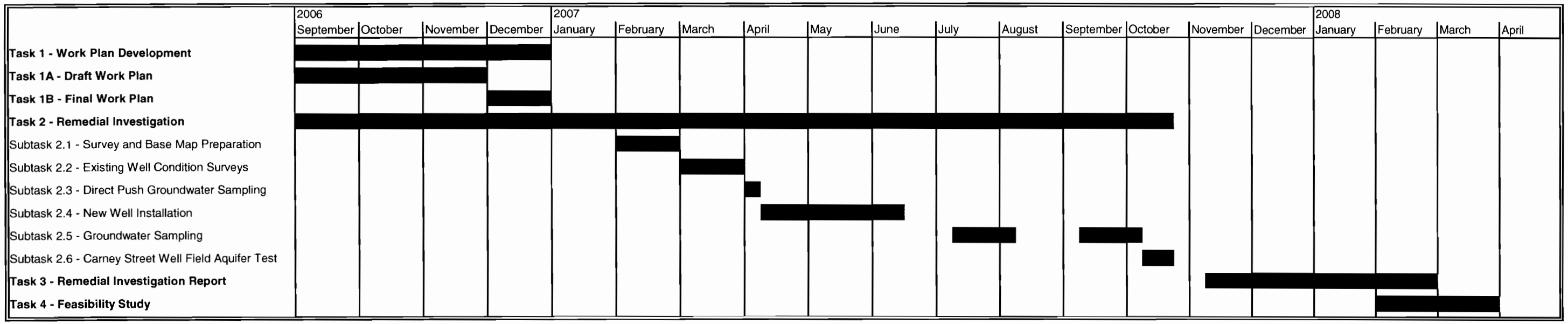
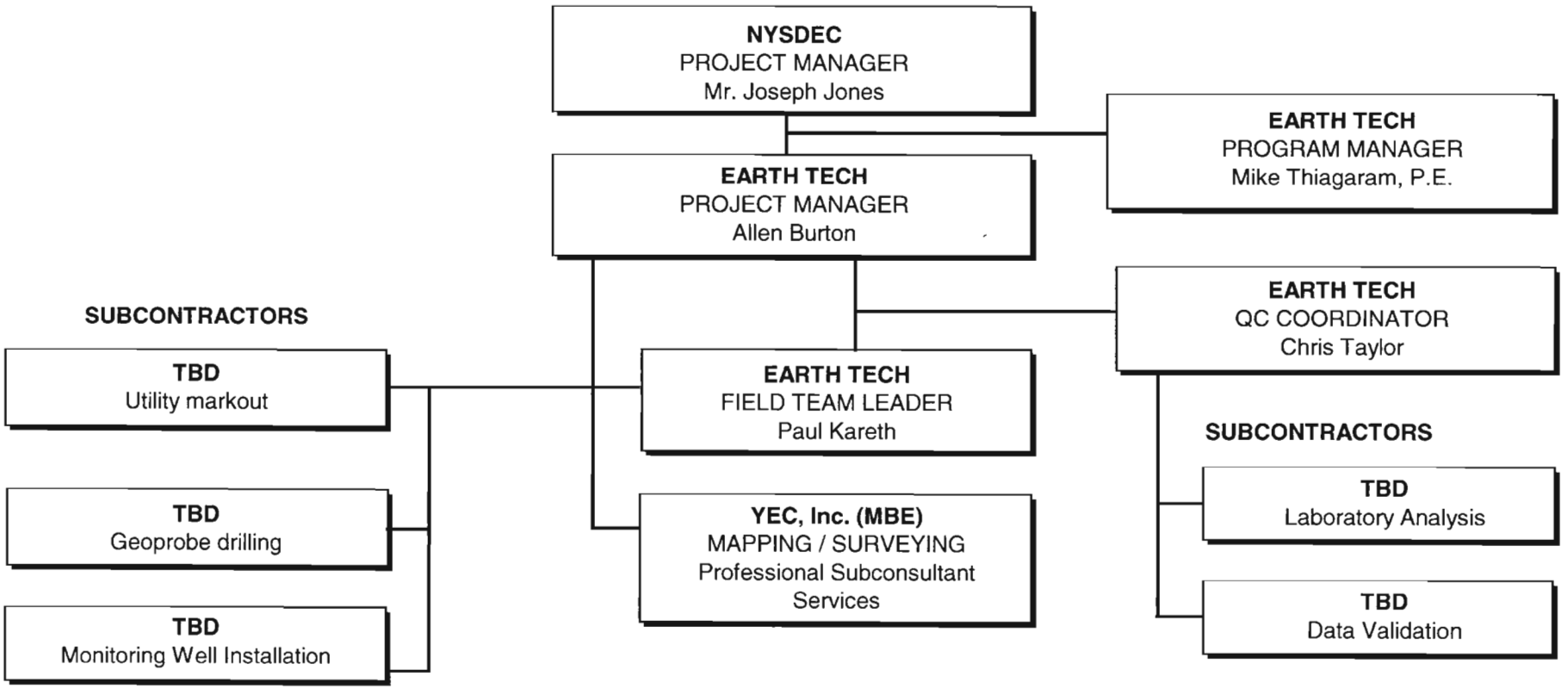


FIGURE 6
PROJECT ORGANIZATION CHART
PHOTOCIRCUITS / PALL CORP OU2 (DEEP GROUNDWATER) RI/FS
WORK ASSIGNMENT No. D004436-04



WORK PLAN APPENDIX A
FIELD ACTIVITIES PLAN (FAP)
DRAFT (80 Percent Submission)

Photocircuits/Pall Corp
OU2 (Deep Groundwater) RI/FS

Photocircuits (#130009),
Pall Corp (#130053B)

Work Assignment No. D004436-04

Prepared for:

SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
625 Broadway
Albany, New York 12233

November 2006

Prepared by:

Earth Tech Northeast, Inc.
300 Broadacres Drive
Bloomfield, New Jersey

Photocircuits/Pall Corp Deep Groundwater RI/FS
Field Activities Plan
Table of Contents

Photocircuits/Pall Corp Deep Groundwater RI/FS
Field Activities Plan
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1 INTRODUCTION

This Field Activities Plan (FAP) specified the field activities to be conducted for a Remedial Investigation and Feasibility Study (RI/FS) of deep groundwater contamination (Operable Unit [OU] 2) at the Photocircuits (45 Sea Cliff Avenue; NYSDEC Inactive Hazardous Waste Site ID 1-30-039; and including the former Pass and Seymour site, ID 1-30-053A) and Pall Corporation (Pall) (30-36 Sea Cliff Avenue; NYSDEC Site 1-30-053B) in Glen Cove, Nassau County, New York (Figure 1). The study for this RI/FS also includes the currently inactive Carney Street Wellfield (north of the two sites), owned by the City of Glen Cove. Field activities for this RI/FS will likely also be conducted on the August Thomsen site (formerly owned by Pall); the right-of-way for Sea Cliff Avenue; and other properties located between the northern end of the Pall site and the Carney Street Wellfield (Figure 2).

1.1 Work Assignment Objectives

This FAP describes the planned activities and schedule to complete a RI/FS of the Photocircuits/Pall Deep Groundwater (OU2) Site. This work is being performed under the Earth Tech Northeast, Inc. (Earth Tech), New York State Department of Environmental Conservation (NYSDEC) Superfund Standby Contract Work Assignment No. D004436-04.

The RI/FS is to be designed and conducted in general accordance with the United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, October 1988) and the NYSDEC Draft DER-10, Technical Guidance for Site Investigation and Remediation.

The objective of the RI is to provide a sufficient characterization of the nature and extent of deep groundwater contamination in the area, including the potential affect on contamination migration under pumping and non-pumping scenarios (of Carney Street Well No. 21) to completing the FS. The FS will identify and evaluate alternatives available for remediation of the site and will be used as the basis for final selection of the appropriate remedial response. NYSDEC has identified several specific alternatives identified for consideration; other alternatives may be generated as appropriate based on the results of the RI. The actual alternatives will be determined in conjunction with consultation with the NYSDEC.

1.2 Site Description and Location

The study area for this Deep Groundwater RI/FS is focussed primarily on three areas, from south to north: Photocircuits (for the description in this section, including the former Pass and Seymour site); Pall Corporation (including the August Thomsen property formerly owned by Pall); and property owned by the City of Glen Cove to the north, which includes the Well No. 21 and the Carney Street wellfield, along with other structures and uses.

The Pall Corporation Site, located at 30 Sea Cliff Avenue, consists of approximately 5 acres of property. The Site is mostly covered with asphalt pavement except for small landscaped areas around the Site building and parking area. Grass and trees border Glen Cove Creek along its entire length where it is present on the Site. The Site topography is relatively flat with an estimated slope across the site of less than 3 percent. Locally, the Site is situated in a low valley at an approximate elevation of 60 feet above mean sea level (MSL). East and west of the Site, the topography rises to elevations of 160 to 180 feet above MSL. A general site location plan is included as Figure 1.

The Pall site includes another industrial facility, August Thomsen, located on the northwest part of the site. The August Thomsen property (36 Sea Cliff Avenue) was once owned by the Pall Corporation. The Pall Corporation site is currently inactive, although August Thomsen is an active company. The Pall Corp site is bordered to the east by the Glen Cove Arterial Highway and residences and commercial areas situated further to the east. The site is bordered to the south by Sea Cliff Avenue. Industrial property, the Photocircuits Corporation site and the Pass and Seymour site, are south of Sea Cliff Avenue. The west side of the site borders on Glen Cove Creek. An industrial facility, Associated Draperies, is situated west of the Creek.

The property north of the Pall site is occupied by the City of Glen Cove and includes the Carney Well Field, a childcare (day care) facility, and garage, maintenance, and equipment storage facilities used by Glen Cove DPW, among others. Vehicular access to this area is only from the southbound shoulder of the Glen Cover Arterial Highway (Route 107), located to the east of the property. Glen Cove Creek is to the west, with the Pall/August Thomsen property to the south. In addition to the Carney Street Well No. 21, several other monitoring wells (planned for use in this RI/FS) are located on this property. NYSDOH collected air samples at the Glen Cove Child Day Care Facility on February 12, 2004; the samples were analyzed by (NYSDOH) Wadsworth Center for Laboratories and Research in Albany, New York. NYSDOH reported "[t]he results indicate that the groundwater contamination beneath the building is not affecting indoor air quality in the building" (NYSDOH, 2004).

The Photocircuits facility occupies about 10 acres at 31 Sea Cliff Avenue, on the south side of the street, directly across from the Pall Corp Site; it is a documented source of chlorinated VOCs and is listed as a NYSDEC Class 2 site (1-30-009). For this discussion, the Photocircuits site is considered to also include the former Pass and Seymour site, which is now occupied by Photocircuits. The former Pass and Seymour site, on the west side of Glen Cove Creek at 45 Sea Cliff Avenue, occupies about 8 acres and is also a NYSDEC Class 2 site (1-30-053A).

1.3 Site History

The Site is located in the Sea Cliff Avenue Industrial Area which has been documented as an area of variable industrial use from the 1940s to the present. Pall Corporation has operated the facility at Sea Cliff Avenue since the early 1950s. The Pall Corporation facility was previously used as a research and development facility for the manufacture of filtration products, but is currently inactive and unoccupied. The August Thomsen property was owned by the Pall Corporation until 1971, when August Thomsen bought the property. During the period that the Pall Corporation owned the August Thomsen property, it was used by its subsidiary, Glen Components, Inc., as a precision machine shop providing parts to Pall's other divisions. Based on a Pall report, chlorinated solvents were used at the Site until approximately 1971. The Photocircuits site (along with the Pass and Seymour site) also have documented histories of chlorinated solvent use and discharges to the environment.

Industrial activities have occurred in the past and are currently occurring on neighboring properties which include Photocircuits Corporation, Pass and Seymour (currently occupied by Photocircuits), and Associated Draperies. These industrial properties are subject to NYSDEC regulatory enforcement action. The Pall Corporation, Photocircuits Corporation, and the former Pass and Seymour properties are listed as Class 2 Inactive Hazardous Waste Disposal Sites (IHWDS) by the NYSDEC. Associated Draperies is listed as a NYSDEC Spills site. Known site history of the Pall Corporation Site is summarized in Section 1.4.

1.4 Previous Environmental Reports

Review of the key reports described below was completed to focus the investigations. The list below is only a partial list of the site-specific and regional documents and reports reviewed.

- Source Area Investigation, Sea Cliff Industrial Area Glen Cove, New York, September, 1992. Prepared by H2M Group.
- Engineering Investigations at Inactive Hazardous Waste Sites Preliminary Site Assessment, Prepared by Nassau County Department of Public Works, March, 1994.
- Remedial Investigation Report, 31 and 45A Sea Cliff Avenue Site, Photocircuits Corporation, 1998; prepared by McClaren/Hart, Inc.
- Preliminary Focused Remedial Investigation Data Report, Pall Corporation Site (Volumes I and II), 1999; prepared by TAMS Consultants and GZA for NYSDEC.
- Phase II Remedial Investigation Report, Pall Corporation (Volumes 1, 2, and 3), 2000; prepared by Enviro-Sciences, Inc.
- Feasibility Study Report, Pall Corporation, 2001; prepared by Enviro-Sciences, Inc.
- Draft Work Plan, Pall and Photocircuits Deep Groundwater OU2; Dvirka and Bartilucci, 2006; prepared for NYSDEC.
- In-Situ Chemical Oxidation Phase II Pilot Test and Source Evaluation Report, Former Pall Corporation Facility, 2006; prepared by Apex Companies, LLC.

The results of these reports were utilized as an aid in understanding historical and current conditions, and evaluate potential contaminant migration pathways and the contaminants of concern. Sample analysis identified elevated concentrations of halogenated and non-halogenated volatile organic compounds (VOCs), including tetrachloroethene (PCE), trichloroethene (TCE), and cis/trans 1,2-dichloroethene (DCE).

A more complete list of the reports reviewed during the plan development task, as well as discussion of reports or documents which are believed to exist but have not yet been obtained, will be presented in the final Work Plan and updated and expanded in the RI report.

Carney Street Wellfield

The Carney Street Wellfield was used as a water supply for public drinking water until abandonment in 1977. H2M performed investigations at this site and identified potential VOC source areas within the soils. The compounds detected include halogenated and nonhalogenated VOCs, including PCE, 1,2-DCE, and TCE.

Groundwater data for well No. 21, covering the period May 1977 through March 2000 (although there are no data for a 10-year period between October 1990 and January 2000) are summarized on D&B Table 2-2 (D&B, 2006). The data shown for the three samples in January 2000 correspond to data provided to Earth Tech by Glen Cove's consultant (Sidney A Bowne) for samples collected at the beginning, mid-point, and end of the pumping test conducted between January 20 and 28, 2006; Earth Tech has not yet located the source of the remaining data. In the earliest data sample for which data are reported (5/31/1977), PCE was detected at a concentration of 195 µg/L and TCE at 104 µg/L (1,1,1-trichloroehtane [1,1,1-TCA] was not detected). Concentrations of chlorinated VOCs varied greatly in the 14 samples collected in the remainder of 1977, with PCE ranging from not detected to 295 µg/L; TCE from not detected to

170 µg/L; and 1,1,1-TCA from not detected to 5 µg/L. Between late 1978 and early 1984, VOC concentrations seemed to stabilize at low concentrations (PCE not detected; TCE not detected to 6 µg/L), although the 1,1,1-TCA concentration increased gradually, from ND in the 1970s to 10 to 18 µg/L in 1982-1984. In December 1984, TCE concentrations spiked at 380 µg/L; and TCE concentrations exceeded 100 µg/L in most of the samples analyzed between 1985 and 1989, with a maximum of 690 µg/L. PCE concentrations also increased in this period, though not nearly as much (ranging from not detected to 35 µg/L). 1,1,1-TCA concentrations were low for most of this period, ranging from ND to a maximum of 3 µg/L between 1987 and 1989. The first reported detection of cis-1,2-DCE (150 µg/L) was in the March, 1989 sample (the lone sample collected that year).

A sample was collected on January 2, 2000, shortly before the pump test; PCE (26 µg/L), TCE (2.5 µg/L), and cis-1,2-DCE (19 µg/L) were all detected (1,1,1-TCA was not). Lower concentrations were reported for the sample collected at the outset of the pump test (January 20, 2000) – TCE (3 µg/L) and cis-1,2-DCE (1.5 µg/L) were the only chlorinated VOCs detected. By the termination of the pump test (January 28, 2000) the reported concentrations of PCE, TCE, and cis-1,2-DCE approached (although were still slightly lower than) the concentrations reported in the pre-test sample (January, 2000).

The last sample data reported from Well No. 21 was collected on March 7, 2000; chlorinated VOCs were not detected, except 1,1,1-TCA at 1 µg/L.

Pall Corporation/August Thomsen

The Pall Corporation site is located in the Sea Cliff Avenue Industrial Area and includes both the Pall Corporation and August Thomsen facilities. Pall, which manufactured filtration products at the site, was founded in 1946 and moved to 30 Sea Cliff Avenue some years later. August Thomsen is located at 36 Sea Cliff Avenue on the northwest corner of Pall Corporation. This property was a research and development facility for Pall's Aerospace Division until 1971. August Thomsen is currently involved in the manufacture of pastry bags and tubes. Pall stored solvents on both of these properties in the past. Spent solvents were released to the ground, confirmed by the presence of VOCs such as PCE and TCE in the soil. These solvents were also found in the groundwater at concentrations much higher than would be produced by any potential upgradient source. Subsequent to a 1994 PSA conducted by Nassau County, largely a compendium of previous investigations, TAMS/GZA performed a Focused Remedial Investigation (FRI) at the Pall site, with field work conducted in early 1998. Further investigation was performed due to elevated levels of VOCs in the groundwater (140,000 ppb PCE, 1500 ppb TCE, and 10,000 ppb 1,2-DCE). The PRP signed a Consent Order to complete a RI/FS Phase II investigation. Thirty six monitoring wells were sampled at the site during the Phase II RI (conducted by Pall's consultant at that time, Enviro-Sciences) in April 1999, January 2000, and December 2000. VOC contamination (maximum 4,250 ppb total VOCs) was detected in several on-site wells and included PCE, TCE, DCE and Freon-113. VOC contamination was also detected in groundwater downgradient (north-northwest) of the site.

A SVE system was installed to remediate soil contamination at the Pall site. A FS and pilot test work plan were approved in 2001 for remediation of groundwater using *in situ* chemical oxidation. In December 2002, the pilot test began with injections of potassium permanganate into the contaminated groundwater. A Record of Decision was signed in March 2004 for *in situ* chemical oxidation of surface and shallow subsurface contamination. The PRP signed a Remedial Design/Remedial Action consent order in 2004. A second *in situ* chemical oxidation

pilot test was performed in 2005. The pilot test consisted of injection of Fenton's Reagent into on-site injection wells.

Photocircuits

The Photocircuits site is located at 31 Sea Cliff Avenue, Glen Cove, NY. The site is bounded by Sea Cliff Avenue to the north, the former Pass and Seymour Site to the west, and an arterial highway to the east; Glen Cove Creek runs along the west side of the site on the northern part, and through the southern part of the site. The Pall site is located across Sea Cliff Avenue from the Photocircuits site. The main site features are several industrial buildings. Most of the site is paved. Photocircuits Corporation is one of several properties that comprise the Sea Cliff Avenue Industrial Area. The property was formerly owned by Powers Chemco (1954-1971) and Kollmorgen Corporation (1971-1986). Kollmorgen and Photocircuits manufactured printed circuit boards. Past investigations of this area have documented high concentrations of chlorinated organics in the groundwater underlying the site. To identify the source of these contaminants, a Preliminary Site Assessment (PSA) was conducted by the Nassau County Department of Public Works (NCDPW) through a Municipal Delegation Agreement with the NYSDEC. The investigation relied largely on compilation and interpretation of existing raw data. The PSA report noted the presence of VOCs, particularly 1,1,1-TCA, in the soil and groundwater associated with these premises, and identifies Photocircuits as a source of methylene chloride, 1,1,1-TCA and PCE. In January of 1997, a site investigation was conducted by a consultant. Based on the results of this investigation, a Remedial Investigation / Interim Remedial Measure Work Plan was finalized in March 1997, and was executed in 1998. During the summer of 2000, a soil vapor extraction (SVE) system interim remedial measure (IRM) was installed in the most contaminated area of the site. In addition a pilot study to use bioremediation to remediate groundwater contamination in the same area was conducted. The SVE system operated satisfactorily for a one year period. The results of the bioremediation pilot study were unsatisfactory. In January 2002 Photocircuits conducted a pilot test for a hydraulic restraint system to prevent migration of VOCs from the site. The full system, consisting of four extraction wells to a depth of about 80 ft bgs arrayed in an "L" shape in the northeast and pumping at about 1 to 3 gpm, was installed in January of 2003. Currently, an investigation us underway to determine the final remedy for the site.

Pass and Seymour

The Pass and Seymour property is located in the Sea Cliff Avenue Industrial Area, an urban area in Nassau County, NY. The site, which is immediately to the west of the main Photocircuits building (roughly separated at the northern part of the site by Glen Cove Creek), is occupied by several industrial and warehouse buildings. It was constructed in 1959 and used as an industrial facility by Slater Electric. Additions to the buildings were made in 1981. During 1988, Pass and Seymour, began operations at the premises, production of electric components using an injection molding process. There were indoor and outdoor drum storage areas. The manufacturing process included a degreasing operation which used PCE as the solvent, which was stored in two tanks located outside of the building. A PSA, completed in 1994 by Nassau County DPW for NYSDEC, used existing data from previous investigations. The PSA showed that PCE was found in the soil beneath the site, indicating past disposal of this compound on the property. PCE was also found in the groundwater under the site, at concentrations well above the applicable NYS Part 703 Class GA groundwater standard. In 1977, the Carney Street Wellfield was no longer useable as a source of potable water, due to VOC contamination apparently originating in

the Sea Cliff Avenue industrial area. Contamination Pass and Seymour probably contributed to the levels of VOCs which caused the restricted usage of the wells.

A site investigation was carried out in January 1997. Based on the results of this investigation, a Remedial Investigation/Interim Remedial Measure (RI/IRM) workplan was finalized in March 1997 and was conducted in 1998. Additional data collection to refine the remedial design and a pilot test for an air sparging (AS)/SVE IRM were performed in 1999. The AS/SVE system was constructed in the summer of 2000 and is currently running satisfactorily, however, groundwater sampling results from January 2001 still show unacceptable levels of contamination in downgradient groundwater. Additional AS and SVE points were installed in the fall of 2002. The full system has been running since December 2002. Photocircuits now occupies the former Pass and Seymour site, and further investigations and remediation at Pass and Seymour are discussed under, and considered part of, the Photocircuits site.

1.5 Current Site Conditions

On September 7, 2006, a site visit was performed and included Mr. Joe Jones (NYSDEC), Mr. Allen Burton and Paul Kareth (Earth Tech) and Mr. Ed Chen (YEC, Inc.). The purpose of the site visit was to become familiar with site conditions and make preliminary observations. Mr. Peter Takach of Photocircuits Corp. accompanied NYSDEC and Earth Tech personnel around the Photocircuits Site. Earth Tech and NYSDEC also observed the property immediately north of the site, believed to be owned by the City of Glen Cove, on which are located a day care center; the Carney Street Wells; and what appears to be a storage or maintenance garage used by the Glen Cove Department of Public Works (the Glen Cove Water Department is part of the Glen Cove DPW).

The Pall Corp part of the site is currently not in use, although operations had apparently ceased recently (sometime in 2006). It had previously been used by the Pall Corporation as a research and development facility for the manufacturing of filtration products. File information indicates that Pall Corp has stated that chlorinated solvents are not used on the Site currently or recently. The Pall Site is asphalt paved except for small landscaped areas around the facility, and tree and grass covered areas along Glen Cove Creek as it flows along the west side of the site.

Earth Tech observed many apparent monitoring wells on the Pall site (as well as on the August Thomsen property). A comprehensive review of the existing wells was not performed on September 7; however, it is apparent that there are many more well covers present on site than the initial monitoring well list provided by NYSDEC would account for. Subsequent file review suggests that many of these additional wells were either injection or monitoring points associated with a pilot study conducted recently (by Pall's consultant) in the northeast part of the Pall Corp site.

The August Thomsen building is located north-northwest of the Pall Corporation facility building. The August Thomsen property is currently in use, reportedly for the manufacture and distribution of a comprehensive line of cake decorating items including colors, tubes, decorating bags, spatulas, turntables, rolled fondant icing, and other tools for baking under the 'Ateco' brand name for bakery and restaurant supply companies and kitchenware stores.

The Photocircuits facility is currently in use and occupies about 10.8 acres on the south side of Sea Cliff Avenue. Photocircuits began operations in 1951; was sold to the Kollmorgen Corporation in 1970; and went private in 1986. Recently (since 2004) Photocircuits consolidated its North American operations to the facility in Glen Cove. Photocircuits manufactures prototype

and military printed circuit boards in Glen Cove (bulk manufacturing is apparently conducted by a plant in China). Subsequently, the company filed for bankruptcy under Chapter 11, and its assets were purchased by American Pacific Financial Corporation in March, 2006. Photocircuits has continued to operate under the new owner (having received financial incentives from the state in an attempt to retain as many of the 850 jobs as possible), but recently (August 2006) announced layoffs at the site (PCDM, August 2006). Photocircuits currently occupies the former Pass and Seymour (previously Slater Electric) facility.

The Glen Cove-owned property north of the Pall Corp site includes an active day care center, the inactive Carney Street Wellfield (the wells were not seen but the structure reportedly housing Well 21 was observed, north of the day care center), and other buildings on the west side of the property (garages and maintenance facilities; some outside equipment storage was noted. This parcel is only partially paved (i.e., there are open areas in addition to the parts covered by buildings or roadways). At the time of the site visit, access was through the day care center. The formal access is apparently available only from Route 107 (Glen Cove Arterial Highway) southbound.

During the site walk, some of the locations of other monitoring wells were observed (e.g., wells identified as "Sea Cliff Avenue" and "Public Supply Wellfield" monitoring wells). The Sea Cliff Avenue monitoring wells were found to be located in the center of Sea Cliff Avenue (i.e., in the yellow stripe separating the eastbound and westbound traffic lanes); however, the location of MW-16PCI/PCD cluster was not established. The location shown on the Dvirka and Bartilluci (D&B) Figure 3-3 suggests it is located south of Sea Cliff Avenue, near the northeast corner of the former Pass and Seymour building (D&B, 2006); however, in conversations with Photocircuits consultant, Mr. Barber of B&L, indicated that well cluster MW-16PC is in fact located within Sea Cliff Avenue. Well cluster GC-2S/2D on Hazel Avenue was located, although the NYSDEC project manager indicated that locating all the "GC" wells could be problematic. Further conversation with representatives of Nassau County DPW confirm that, although the wells are currently under the jurisdiction of the county DPW, the exact location of all the GC-series wells is not known.

1.6 Preliminary Evaluation of Remedial Alternatives

Soil boring logs from previous investigations indicate that the subsurface geology consists of silts and sands. The thickness of the deposits is over 100 feet.

The site is underlain by the following sequences, in descending order: the Upper Glacial Aquifer, the Port Washington confining unit, the Port Washington aquifer, the Lloyd Aquifer and bedrock. Depth to groundwater varies between 4 and 10 feet below ground surface (ft bgs) at the site. Monitoring wells in the area, as well as the Carney Street Well No. 21, are screened in the Upper Glacial Aquifer. Hydraulic conductivity generally varies between 10 and 300 ft/day. Measurements from deep wells indicate that groundwater flow is to the northwest. Shallow groundwater also flows predominantly toward the northwest. As the groundwater flow direction in the area is generally northwest, the Photocircuits site is hydraulically upgradient of the Pall site; both sites are upgradient of the former Carney Street Wellfield. Contamination, including PCE, TCE, and their degradation products (e.g., 1,2-DCE and vinyl chloride), along with 1,1,1-TCA and Freon-113, have been identified in the saturated soils and groundwater at the site. Previous groundwater investigations have reported groundwater contamination at both Pall and Photocircuits sites, as well as in samples from the Well No. 21 at the Carney Street Wellfield.

Given these general conditions, NYSDEC has identified a preliminary list of presumptive remedies, including:

- No further action with or without long-term monitoring (natural attenuation);
- Groundwater extraction and treatment (e.g., with treatment technologies such as carbon absorption, ultraviolet oxidation, or air stripping);
- Groundwater remediation by air sparging (with or without vacuum extraction); and,
- Any alternate or emerging technologies identified by NYSDEC or Earth Tech during the course of the RI.

2 FIELD SAMPLING PROCEDURES

The following scope of work has been developed to further evaluate known contamination at the site, migration of contaminants, and the feasibility of the likely remedial alternatives described above. The scope is divided into four tasks:

- Task 1 – Work Plan Development (Draft and Final);
- Task 2 – Remedial Investigation;
- Task 3 – Remedial Investigation Report; and
- Task 4 – Feasibility Study.

The RI is intended to obtain site-specific data pertaining to the extent of contamination and the extent to which releases or potential releases from the site pose a threat to human health and the environment. The specific objectives of this project, as defined by the NYSDEC, are as follows:

- Assess site geology;
- Assess hydrogeology;
- Evaluate areal and vertical extent of contamination, including transport mechanisms;
- Assess the source(s) of contamination and determine if this source(s) has impacted off-site properties; and,

To accomplish the above stated objectives, the field subtasks discussed below are proposed. Additional methodology information will be provided in the Quality Assurance Project Plan (QAPP). Unless otherwise noted, it is assumed that all field work will be completed at level D personal protection in accordance with the Health and Safety Plan. Field activities will be monitored by an Earth Tech representative(s).

2.1 General Field Activities

General Field Activities include mobilization, implementing the Health and Safety Plan, and decontamination and handling of investigation wastes. Upon NYSDEC approval of the final site-specific FAP, QAPP, and HASP, subcontracts will be executed.

2.1.1 Mobilization

Following authorization to proceed with the field investigation from NYSDEC, Earth Tech and its subcontractors will mobilize necessary materials and equipment to the site. New York DIG SAFE CALL CENTER at 1-800-272-1000 will be contacted to clear exploration locations. Utility clearance will require three working days.

Although representatives of Pall Corp and Photocircuits have indicated a willingness to be cooperative with the field efforts associated with this RI, provision is made for providing all necessary facilities and material independent of the site owners/occupants. Therefore, mobilization will include establishing a Site trailer, temporary sanitary facilities and the construction of a temporary decontamination pad that will remain in place during the field effort. A drum storage area will be established for the temporary storage of investigation derived waste, including soil cuttings, monitoring well development water, decontamination fluids and purge water from groundwater sampling. Soil cuttings may be temporarily stored in roll-off containers.

A project kick-off meeting will be held prior to initiating field work to orient field team members and subcontractors with the site and to familiarize all site workers with site background, potential dangers, health and safety requirements and emergency contingencies and other field procedures.

2.1.2 Health and Safety

It is anticipated that the work to be completed at the Pall Corporation site will be performed in Level D personal protection with the potential to upgrade to Level C. Field workers will be instructed to keep Level C equipment available should it be needed. Should health and safety monitoring during field activities indicate a threat to field personnel or warrant an upgrade beyond Level C protection, work will stop and site conditions will be re-evaluated by NYSDEC and Earth Tech. An upgrade to Level B protection will require modification of the HASP and review by Earth Tech's district safety manager.

The draft HASP will be submitted as a separate deliverable, as Earth Tech policy requires additional internal review prior to release.

2.1.3 Decontamination and Handling of Investigation Derived Waste

The sampling methods and equipment have been selected to limit both the need for decontamination and the volume of waste material to be generated. Decontamination procedures specific to each of the field activities are described in Section 2.11 of this FAP. Personal protective equipment and disposable sampling equipment will be placed in plastic garbage bags for disposal as a solid waste. The types of waste to be generated include: soil cuttings from monitoring well installation; development and purge water from the wells; and decontamination water from the drill rigs, Geoprobe rig and equipment. Monitoring well purge water, and decontamination water will be disposed into the on-site sanitary sewers.

2.2 Interviews and Historic Data Review

Historical data review will be conducted to obtain additional information regarding site history and current conditions; this process is ongoing and the summary presented in this draft FAP is not complete. The initial review consists of agency (NYSDEC) files obtained from the NYSDEC project manager.

2.3 Utility Clearance

Prior to the start of intrusive activities, a call will be placed to One Call for utility markouts. Should the utility markouts indicate that potential utilities are close to a proposed drilling location, the location will be moved to avoid utilities at the discretion of the field personnel and the drilling subcontractor.

2.4 Existing Monitoring Well Condition Survey

As can be seen from Table 2-1 and Figure 3, there are a large number of existing wells in the vicinity of the Carney Street Wellfield. As these wells have been installed over at least a 40-year period and by different organizations, the available data varies and in some cases is contradictory. Some of the wells reportedly can no longer be found; and in other cases wells could not be located in a preliminary attempt during the site visit (September 7, 2006). In addition, the condition of the wells is no known (although some wells on the Pall Corp and August Thomsen property were observed to have potentially compromised surface completions).

Therefore, prior to initiating any sampling at the site, an initial well condition survey will be conducted. The following will be part of this survey.

- Contact the responsible organization (e.g., the consultants for Pall Corp and Photocircuits; Nassau County DPW; Glen Cove Water Department; etc.) for as much information as is available with regard to the location and status of the well.
- Locate the well. If the well is found, and in a location where acceptable to the site owner, the ground next to the well will be spray-painted with the well number (if known). In addition, the approximate location will be recorded using field GPS (the exact location will be surveyed later).
- Open the well, noting surface completion and integrity, and presence of lock, and evidence of depth measurement reference point (e.g., notch in casing).
- Screen for organic vapors (using MultiRAE or similar instrument).
- Record, as a minimum, the following information
    - Well diameter
    - Material of construction
    - Depth to water
    - Total depth of well
    - Observations regarding well integrity (e.g., does observation suggest that seal has been damaged; well is bent; etc.)

The information from this well condition survey will then be used to refine and if necessary modify the list of wells to be sampled; and possibly to modify the number or location of new wells to be installed as part of the RI.

It should be noted that all the wells shown on Table 2-1 (with the exception of the three Sea Cliff Wells [SC-2, SC-5, and SC-7, installed by Nassau County]) will be included in this baseline well condition survey, regardless of whether or not this well is currently planned for sampling. This will be done both for the purpose of the initial (first round) groundwater sampling, so that there is enough information about the wells to evaluate potential substitute (replacement) wells to be sampled if some wells cannot be located, or prove to be in poor condition; and also so that there is sufficient information to design subsequent sampling events, after review of the data from the first event (e.g., the first event might suggest that additional upgradient or cross-gradient wells should be sampled to establish groundwater flow or contaminant plume delineation).

2.5 Direct Push Groundwater Sampling

A limited direct push sampling investigation will be conducted in the vicinity of a suspected source area (near previous Geoprobe groundwater sampling point 31-GW-04B) on the Photocircuits site. At two locations (see Figure 4), direct push borings will be advanced to a depth of approximately 160 ft bgs for the purpose of collecting stratified groundwater samples. Groundwater samples will be collected at 10 foot intervals from approximately 160 ft bgs to the groundwater table using a hydropunch type device such as a Geoprobe S-15 sampler. The hydropunch devise will be advanced to the targeted depth and retracted to expose the stainless steel screened interval. A peristaltic pump will be used to purge groundwater from the hydropunch with the goal of obtaining clear water prior to sampling. Field measurements of temperature, pH, conductivity, dissolved oxygen (DO), oxygen reduction potential (ORP), and turbidity will be collected during purging and will be recorded on the Well Sampling Form (Appendix A). After several minutes of purging, a groundwater sample will be collected using the peristaltic pump. The sample will be submitted to the laboratory for VOC analysis. Once sampling is complete, the hydropunch will be lifted to the next interval and purged for several

minutes to clear water from both the screen and the tubing. The sampling process will then be repeated.

2.6 Monitoring Well Installation

Monitoring wells will be installed to supplement the existing well network, and focus on (although are not limited to) assessing deep groundwater contamination. Proposed monitoring well locations are shown on Figure 4. In a number of cases, a new deeper well (typically shown with the "D2" suffix) will be installed to augment an existing well cluster (e.g., "S", "M" [or "I"], and "D" wells). Whenever possible, borings will be advanced using 4¼-inch hollow stem augers (HSAs) with a center plug. The HSAs will be advanced to the target depth for well installation. If difficulties with running sands are encountered which hinder drilling, potable water may be introduced into the HSAs to maintain a positive hydrostatic head.

Soil cuttings generated from the boreholes will be logged and documented by a geologist. In addition, a subset (six) of the new wells (MW-GD2; MW-2AD2; MW-4PD2; MW-16PD2; MW-GW-4D; and MW-19D) will be logged by collecting split spoon samples at 5-ft intervals. Notes will be kept in both bound field books and boring logs. The Unified Soil Classification System (USCS) will be used to describe the soil. Cuttings will also be screened for VOCs using an organic vapor analyzer equipped with a photoionization detector (PID).

The monitoring wells will be constructed of 2-inch schedule 40 or schedule 80 threaded, flush joint PVC casing and matching 0.010-inch factory slot PVC well screen. Schedule 80 PVC has been selected for its increased strength, due to the depth (over 200 ft bgs in some cases) of the new wells; it is tentatively assumed that all new wells greater than 100 ft bgs will be constructed of schedule 80 PVC. Each well screen will be 10 ft long.

The well screen and riser pipe will be inserted into the HSAs and set to the desired depth. A clean sand filter pack consisting of Morie number 1 sand (or equivalent) will be placed into the annular space around the screen from approximately one foot below the screen and will extend a minimum 2 ft above the top of the screen. A minimum one foot thick bentonite seal will be placed above the filter pack and allowed to hydrate. The remaining borehole will be grouted using cement-bentonite grout. Grout will be tremmied into the annular space extending from the bentonite seal to just below ground surface. A flushmount well cover will be installed in a cement pad at ground surface.

Attempts will be made to install all of the wells using the hollow stem auger drilling method. However, since the screen zone for the deep well in the cluster to be installed at the Carney Street Well Field is 210 to 220 ft bgs, this well may need to be constructed using the water rotary drilling method, depending on the drilling conditions encountered during construction of the other wells. If the water rotary method is required, a minimum 6-inch diameter roller bit will be utilized to advance the borehole. The Earth Tech inspector will record the amount of potable water used during drilling, noting the amounts used during drilling, intervals where water is lost to the formation during drilling and zones where water is gained during drilling (artesian conditions). Water rotary is preferred over mud rotary; however, if there are problems with running sands or collapsing intervals drilling mud (such as Benseal) may be used to stabilize the borehole. Mud rotary techniques will be used only if all other methods to advance the borehole are unsuccessful. Deep wells (in excess of 100 ft) will be constructed of 2-inch Schedule 80, 0.010-inch slot PVC well screen and threaded, flush joint PVC casing at the discretion of the driller. The filter pack, bentonite seal, grout and well cover for deep wells will be installed in the same manner as previously described.

2.7 Well Development

After the grout has been allowed to set for at least eight hours, each new monitoring well will be developed to achieve hydraulic connection between the formation and the well screen. A suitable pump will be selected for development at each well. Each well will be developed for a minimum of one hour. During development, the field supervisor will record development information on the Well Development form. Periodic readings (every five to ten minutes) will include depth to water, pumping rate, temperature, pH, conductivity and turbidity. The goal of development will be to remove at least several casing volumes of water and achieve a turbidity reading of 50 nephelometric units (NTU) or less. If these development goals have not been achieved after two hours of development, the field supervisor will contact the Earth Tech project manager for further instructions. During development of the deep wells that are installed using water or mud rotary methods, extra effort will be made to remove as much of the water (and drilling fluids) lost to the formation during drilling as possible.

2.8 Groundwater Sampling

Two rounds of groundwater sampling are scheduled for the Site. The preliminary list of wells to be included in the sampling are included in Table 2-2; however, the list may be modified based on the results of the well survey. Groundwater sampling will be performed to evaluate the extent of groundwater contamination. Low flow sampling techniques will be employed to collect groundwater samples. A bladder pump (or similar submersible pump) will be used to purge the wells. The sampling procedure will follow the EPA low flow sampling procedures (EPA SOP, 1998). The pump intake will be set at the midpoint of the screened interval. The pump will be operated at a flow rate of 300 to 500 milliliters per minute (mL/m). Dedicated Teflon or Teflon-lined tubing will be used for all groundwater sample collection. Several parameters will be recorded during purging including flow rate, depth to water, temperature, pH, conductivity, DO, ORP and turbidity. The measurements will be recorded on the Well Sampling Forms. Measurements will be collected approximately every five minutes. A flow cell will be used to measure most of the parameters. Purging will be considered complete when the indicator parameters have stabilized over three consecutive readings. Stabilization parameters are:

- flow rate: between 300 and 500 mL/m;
- depth to water: less than 0.3 ft drawdown during purging;
- pH: ± 0.1
- conductivity: ± 3%
- DO: ± 10 mV
- ORP: ±10% and
- Turbidity: less than 50 NTU.

An attempt will be made to achieve these criteria. However, if stabilization is not achieved after two hours of purging, the field team leader will notify the Earth Tech project manager who will contact the NYSDEC project manager for further instruction (unless default contingencies are established in advance).

During sample collection, the flow cell will be disconnected and the sample tubing discharge will be poured directly into the laboratory supplied sample containers. The flow rate will be decreased to approximately 100 mL/m during sample collection for VOCs analysis.

The existing monitoring wells identified to be useful and viable during the well inspection survey will be purged and sampled. Based on the initial scope of work provided by NYSDEC, the 53 proposed existing wells to be sampled (see Table 2-2) include:

Pall Corp Wells (n = 20)
Access coordinated through Pall Corp and its consultant (Apex)
MW-1P, MW-1PI, MW-1PD, MW-4P, MW-4PI, MW-4PD, MW-5P, MW-5PI, MW-5PD, MW-6P, MW-6PD, MW-10PS, MW-10PI, MW-10PD, MW-11PS, MW-11PI, MW-11PD, MW-13PS, MW-13PI, MW-13PD

Photocircuits Wells (n = 7)
Access coordinated through Photocircuits and its consultant (Andrew Barber of Barton and Loguidice)
MW-3, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12

City of Glen Cove Wells/Carney Wellfield (n = 3)
Access to these wells will be coordinated with Glen Cove DPW/Water Department; these are apparently not county wells.
MW-1GS, MW-1GI, MW-1GD. [Need to resolve depth/ duplicate listing anomaly during well condition survey or before]

August Thomsen Wells (n = 6)
Access to these wells will be coordinated with Pall Corp's consultant and with the owners of the August Thomsen property.
MW-2A, MW-2AI, MW-2AD, MW-12PS, MW-12PI, MW-12PD [MW-12 cluster on Pall Site]

Public Water Supply Monitoring Wells (n = 13)
Access to these wells to be coordinated through Nassau County DPW (to be confirmed)
GC-1D, GC-2S, GC-2D, GC-3S, GC-3M, GC-3D, GC-4S, GC-4D, GC-5S, GC-5D, GC-10S, GC-11S, GC-11-D

Sea Cliff Avenue (n = 4)
These wells reported installed by Pall's consultant (Apex Environmental). Access may require coordination with Apex/Pall Corp; Nassau County DPW (based on information that Sea Cliff Avenue is a county road); and Glen Cove police department and/or DPW (for road closure/restrictions necessary for safe operation).
MW-14PCD, MW-15PCD, MW-16PCI, MW-16PCD

2.9 Aquifer Test – Carney Street Well Field

An aquifer test will be conducted on Well No. 21 of the Carney Street Well Field. The objectives of this test are to determine the capture zone and hydraulic dynamics of Well No. 21, and to determine the groundwater quality of the pumped groundwater. The results of the pump test will be evaluated to assess the viability of future operation of Well No. 21 for VOC plume capture, treatment, and potential use of the treated water for industrial purposes.

The pumping of Well No. 21 and associated discharge will be coordinated with the City of Glen Cove. The pump test will be conducted for up to 48 hours and the well will be pumped at the maximum practical pumping rate at a constant rate. It was reported in historical files that the well had a capacity of 1,400 gallons per minute (gpm). The maximum pumping rate will be further confirmed by a review of the available pumping data pertaining to the Carney Street Well Field. If the maximum pumping rate is not confirmed, a step test will be performed to determine the maximum pumping capacity of well No. 21. The 48 hours pumping duration may vary as based upon the on site review of the water level readings collected from the upgradient monitoring wells during the initial phase (first 12 to 24 hours) of the pump test.

Water level measurements will be collected from the production well and selected nearby monitoring wells. The pump test is planned to be performed after the installation of the proposed new monitoring wells and after the second round of groundwater sampling. Water level readings will also be recorded in all the existing and new monitoring wells during this round of groundwater sampling. The information collected during the first round of groundwater sampling will be utilized in selecting the monitoring wells for water level measurements. Water levels will be measured and recorded during the recovery period. The recovery period will be considered complete when the water level has returned to 90 percent of pre-test levels. The water levels will be collected manually using an electronic water level indicator and electronically by transducers with data logging capacity. The wells requiring transducers will be selected after review of the data from the first round of groundwater sampling.

Background measurements will be collected from selected monitoring wells for a week prior to the pump test. The pump test is proposed to be conducted immediately after the second round of groundwater sampling. Therefore, the Earth Tech personnel performing groundwater sampling can also measure water levels in selected monitoring wells at the specified intervals.

Previous plans assumed that the pump test water (about two million gallons per day, based on 1400 gpm flow rate) will be discharged to the Glen Cove sewer system as was reportedly done during previous investigations (i.e., the pump test conducted by a consultant to the Glen Cove DPW in January, 2000), and that permission will be obtained from the City of Glen Cove and the pump test will be coordinated with the City. However, during Earth Tech's review of background information and interviews with local officials and other knowledgeable parties, it appears that the pump test water may have been discharged directly to Glen Cove Creek (A. Martino, pers. com, 11/14/06). Since the previous pump test (January 2000), Nassau County has instituted a county-wide stormwater management program and has filed a notice of intent (NOI) to operate under general SPDES permit GP02-02. As of this writing, Earth Tech has been unable to determine what specific disposal options will be available, or what conditions might be imposed on the discharge; or even what agency has jurisdiction over this discharge. Several of the county personnel contacted suggested that Earth Tech prepare a formal request describing the proposed activity and discharge and submit the request in a letter to the commissioner of the Nassau County DPW (Mr. Ray Ribiero). A more detailed assessment of discharge options is presented in Section 2.11 of the Work Plan.

Samples for analysis will be collected of pumped water from Well No. 21 in addition to the four new wells of the cluster to be installed 75 ft to the south (see Section 2.2.9). The samples will be collected at the beginning of the pump test and at 12-hour intervals thereafter, including a sample when the test is terminated. These samples will be analyzed for TCL VOCs.

2.10 Groundwater Elevation Survey

In order to better understand the hydrogeologic connections between the various Sites, Earth Tech will collect two rounds of synoptic water level readings from the wells listed on Table 2-2 (concurrently with or immediately prior to each of the two groundwater sampling events). The Earth Tech field team will mobilize to the sites and split up into groups in order to collect as many water levels readings as possible during the day. At each well, the water level will be measured using an electronic water level meter and the water level will be recorded to the nearest 0.01 ft. The reading will then be recorded in the field notebook. Once the field crew returns to the office, the data will be converted into elevations. These elevations will be used to prepare a groundwater contour map for each synoptic event which will be included in the RI Report.

2.11 Decontamination Procedures

A decontamination pad will be constructed on the Pall Corp Site. The pad will be large enough to handle the drill rig. The pad will also be used for small equipment decontamination as well as personnel decontamination.

2.11.1 Small Equipment Decontamination

Small equipment decontamination for non-reusable equipment such as Geoprobe hydropunch samplers, transducer probes and cables, etc., will be accomplished using the following procedures:

- Alconox (or equivalent) and potable water wash;
- Potable water rinse;
- Distilled/deionized water rinse;

Solvents will not be used in the field decontamination of such equipment. Decontamination will include scrubbing/washing with a laboratory grade detergent (e.g. Alconox) to remove visible contamination, followed by potable (tap) water and analyte-free water rinses. Tap water may be used from any treated municipal water system; the use of an untreated potable water supply is not an acceptable substitute.

Equipment should be allowed to dry prior to use. Steam cleaning or high pressure hot water cleaning may be used in the initial removal of gross, visible contamination.

Electric submersible pumps (such as a Grundfos Redi-Flow II) will be decontaminated using the above steps followed by running a large volume (several gallons) of potable water through the pump, followed by an analyte-free water rinse. Tubing will not be re-used (new tubing will be used for each well). Submersible pumps and supporting lines and cables will be place in a large plastic garbage can filled with potable water and then run for several minutes (to decontaminate both exterior and interior parts); submersible pumps will also be given a final analyte free water rinse of both interior and exterior parts.

If bladder pumps are used, the pump will be disassembled and cleaned after each used. A new bladder will be used for each sample. Small parts, such as screens and gaskets will be replaced after each use. Dedicated air line tubing and Teflon sample tubing will be used at each monitoring well. The pump will be cleaned using the following steps:

- Alconox (or equivalent) and potable water wash;

- Potable water rinse;
- Distilled/deionized water rinse;
- Solvent rinse;
- Distilled/deionized rinse, air dry.

2.11.2 Heavy Equipment Decontamination

Drilling equipment will be decontaminated before the first use during this project, between boreholes and prior to demobilization using high-pressure steam. Decontamination will be conducted at a dedicated decontamination pad constructed for this project on the Pall property. Decontamination fluids will be contained for subsequent discharge to the City of Glen Cove sewer system.

2.11.3 Personnel Decontamination

Wash buckets and potable water will be set up at the decontamination pad on the Pall Corp property for personal use. This includes washing hands and a boot wash. Details of the personnel decontamination procedures will be provided in the HASP.

3 FIELD RECORDS AND DOCUMENTATION

The objective of this subsection is to provide consistent procedures and formats by which field records will be kept and activities documented, and a methodology by which field records will be managed. Field records and documentation to be used during field activities include Field Log Books and Standard Forms. Standard Forms include chain-of-custody (COC) forms, Drilling Logs, Well Installation Diagrams, Well Development Forms, Well Sampling Forms, Aquifer Testing Forms, and investigation derived waste (IDW) Log Sheets. Example forms are provided in Appendix A.

3.1 Field Log Books

Field log books will be prepared and maintained throughout the course of the investigation for each of the four sites. Only bound, weatherproof field log books will be used by personnel working on this project. The log books will be turned in for copying/filing/tracking to the FS when complete.

Each log book will be labeled on the front cover in indelible ink with the following designation: "Photocircuits/Pall Corp OU2 (Deep Groundwater) RI/FS, NYSDEC Work Assignment D004436-04, Earth Tech Project Number 95636".

Log book entries will be recorded in indelible, waterproof ink. If errors are made in any field log book, field record (form), Chain-of-Custody Record, or any other field record document, corrections will be made by crossing a single line through the error, entering the correct information, and initialing and dating the correction.

Entries will be made in the following format. Documentation and reporting of events and activities will be made in chronological order on the right page of an open log book. The left page of the log book will be used for extemporaneous reporting, such as sketches, tables, providing details or comments on events reported sequentially, or interpretations, and notes identifying use of any other field documentation such as COCs and Standard Forms.

Standard Forms have been adopted in this FAP to facilitate the collection of consistent data. This will preclude detailed documentation of, for example, lithologic descriptions in the Field Log Book. A reference, however, to use of each specific form must be made in the log book.

The date will be placed at the top of every page in the left-hand corner of the right page. The time of entry recordings will be in columnar form down the left-hand side of the right page. If an entry is made in a non-dedicated log book, then the date, project name, and project number will be entered left to right, respectively, along the top of the right page. Entries should be dated, and time of entry recorded. At the beginning of each day, the first two entries will be "Personnel/Contractors On Site" and "Weather." At the end of each day's entry or particular event, if appropriate, the person entering the field notes should draw a diagonal line originating from the bottom left corner of the page to the conclusion of the entry and sign along the line indicating the conclusion of the entry or the day's activity.

Entries in field log books will be legible (printing is preferable) and will contain accurate and inclusive documentation of project activities (investigation, monitoring remediation, closure, maintenance, etc.). Information pertaining to health and safety aspects, personnel on site, visitors' names, association, and time of arrival/departure, etc., should also be logged. Language

should be objective, factual, and free of personal feelings or other terminology that might prove inappropriate, since field records are the basis for later written reports. Once completed, these field log books become accountable documents and must be maintained as part of the project files.

Sample collection and handling activities, as well as visual observations, will be documented in the Field Log Books. The sample collection equipment (where appropriate), field analytical equipment, and equipment used to make physical measurements will be identified in the field log books. Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment will also be recorded in the field log books, except where these are referenced as being recorded on approved field forms. Field analyses and measurements must be traceable to the specific piece of field equipment utilized and to the field investigator collecting the sample, making the measurement, or conducting analyses. Log books will be updated as field work progresses.

When an individual log book is full, the log book will be submitted to the Earth Tech project manager for final cataloging and filing. The log books will be stored in the Project File. Copies of specific sections will be made available to personnel upon request, with the approval of the FS.

3.2 Standard Forms

All non-bound field records (e.g., drilling logs, well construction forms, sampling records, COCs, aquifer testing forms) will be completed the day the associated activity occurs. Field data collected using electronic data loggers or computer entry forms, will be downloaded as soon as practical onto 3½-inch floppy disks or CDs. If possible, the person collecting the data will download electronic data on a daily basis. This person will be responsible for verifying that the data collected are adequately represented in electronic media and in the file. A hard copy of the data, and any graphical representation produced by logging software, will also be printed out and duplicated.

3.3 Sample Handling Procedures

Sample Containers, Preservation, and Holding Times

The selection of sample containers is based on the media sampled, the required analysis, and the requirements of the analytical laboratory. QAPP Table 4 (Appendix B) summarizes the sample container requirements for various media and analytical parameters. The table also details the preservation requirements and holding times that will be followed to maintain sample integrity.

3.4 Sample Identification

During this project, a unique sample identifier will designate each sample collected. As there are numerous wells at the various Sites, the system uses the existing well designations and modifies them so as to provide a reference to the Site and avoid confusion when referencing older reports. The following system will be used to assign unique sample identification numbers. Each sample will be identified by an alphanumeric character identifier, as described below.

The first two characters in the identifier will consist of the two-digit site designation number (e.g., 01 for monitoring wells at the Photocircuits Site).

Site Name	Site Number
Photocircuits	01
Pass and Seymour	02
Sea Cliff Avenue	03
Pall Corp	04
August Thomsen	05
City of Glen Cove	06
Public Water Supply	07

The second set of characters of the sample ID will use the existing well designations given to each well at the time of installation. All new monitoring wells installed as part of this investigation will be designated using the Site codes noted above and will have a "100" suffix: 01MW-101S, 01MW-101M, etc.

The following codes will be used for identifying other sample types:

CODE	Sample Type
FB	Field (Rinsate) Blank
N + 50	Field Duplicate (e.g., field duplicate of MW-3S will be MW-53S)
TB	Trip Blank
MS/MSD	Matrix Spike/ Matrix Spike Duplicate

Field blanks and tip blanks will be labeled for the day of collection. Trip blanks will be labeled in the same fashion. For MS/MSD samples, the MS/MSD will be added to the sample ID and included on the COC as a note.

Examples of sample numbering are indicated below.

Sample Identifier	Description
01MW-1P	Existing Pall Corp well MW-1P
02MW-3	Existing Photocircuits well MW-3
02MW-101D	New deep monitoring well on Photocircuits Site
FB070203	Field blank collected on February 3, 2007

3.5 Sample Labeling

A non-removable label will be affixed to each sample container. Labels will be marked with permanent marker pens. The following information will be contained on each label:

Project name;

Sample identifier;

Company (Earth Tech);

Sample date and time;

Sampler's initials;

Sample preservation; and

Analysis required.

3.6 Sample Chain of Custody

At the time of the sampling, a field team member will record the sample information in the field log book, well sampling form or drilling log, and on a COC form. The sample information recorded in the log books will be at least as detailed as that recorded on labels, and should indicate the type of sample (e.g., groundwater, soil), sample preservation, and sampling location, in sufficient detail as to allow re-sampling at the same location. Errors on forms or logbook entries will be stricken with a single line and corrected, with the date and initials of the person making the correction.

After samples are collected, the field team member will immediately place the filled containers in coolers and iced to 4°C. Samples will be preserved as required and specified in the QAPP (Table 4). The field team will maintain custody of the samples until they are shipped to the laboratory. The entries on the COC form will correspond to the field log book, Standard Forms, and sample labels.

Original white copies of COCs will be forwarded to the laboratory. Yellow copies and associated shipping air bills will be maintained by the Field Supervisor with all other documentation until provided to the Project Manager. COCs will be copied to the field file in the field trailer weekly. Yellow copies will be filed by the Project Manager or designated representative on a weekly basis (at a minimum) in the Project File for permanent storage.

3.7 Sample Packaging and Shipping

Samples collected for laboratory analysis will be shipped by a commercial overnight delivery service to the laboratory on the day of collection (if possible; otherwise samples will be shipped on the day after collection), following proper identification, chain-of-custody, preservation, and packaging procedures. Sample packaging and shipping procedures are summarized as follows:

A properly completed chain-of-custody form will accompany each sample shipment. The sample identifiers will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to the laboratory, or to/from a secure storage area.

Samples will be properly packaged to avoid breakage, stored on ice at 4 °C for shipment and dispatched to the appropriate laboratory for analysis. (In the event that samples must be held overnight prior to shipment, the temperature of the cooler and presence of sufficient ice will be checked and new ice added prior to shipment.) A signed COC form will be enclosed and secured to the inside top of each sample box or cooler. The COC (white copy), a cooler receipt form, and any additional documentation will be placed in a plastic bag to prevent them from getting wet. The Field Supervisor will retain the yellow carbon copy.

Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. Signed custody seals will be covered with clear plastic tape. The cooler will be taped shut with strapping tape in at least two locations.

Samples will be transported to the laboratory by a commercial overnight carrier (e.g., Federal Express).

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TABLE 2-1
Photocircuits / Pall Corp. Site
Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Pall Corporation	MW-1P	1/21/1992	5-15	No	4	
	MW-1PI	3/10/1999	41-51	48.10	2	
	MW-1PD	3/11/1999	90-100	90.61	2	
	MW-2P	1/22/1992	4-14	No	4	
	MW-3P	1/21/1992	3-14	15.21	4	
	MW-4P	1/20/1992	13-23	23.80	4	
	MW-4PI	3/12/1999	45-55	48.35	2	
	MW-4PD	3/16/1999	91-101	101.50	2	
	MW-5P	1/20/1992	3-13	13.30	4	
	MW-5PI	3/17/1999	40-50	48.35	2	
	MW-5PD	3/17/1999	90-100 +5	98.82	2	Artesian 3/06
	MW-6P	8/14/1992	50-60	59.88	4	
	MW-6PD	3/9/1999	90-100	100.95	2	
	MW-7P	11/18/1996	3-18	17.55	4	
	MW-8PS	3/25/1999	5-15 +5	13.88	2	
	MW-8PI	3/25/1999	40-50	49.79	2	
	MW-10PS	3/19/1999	5-15 +2	15.16	2	
	MW-10PI	3/19/1999	40-50 +5	50.95	2	
	MW-10PD	3/22/1999	90-100 +5	96.59	2	Artesian 3/06
	MW-11PS	8/17/1999	5-15	11.78	2	
	MW-11PI	8/17/1999	40-50	49.95	2	
	MW-11PD	8/16/1999	85-95	96.59	2	Artesian 3/06
	MW-13-PS	9/19/1999	5-15	14.65	2	
	MW-13PI	8/19/1999	40-50	50.23	2	
	MW-13PD	8/18/1999	85-95	94.70	2	
	MW-17PS	Recent?		28.75	4	Data from Apex
	MW-17PI	Recent?		54.60	4	Data from Apex
	MW-18PS	Recent?		26.20	4	Data from Apex
	MW-18PI	Recent?		56.40	4	Data from Apex
	MW-19PS	Recent?		26.20	4	Data from Apex
	MW-19PI	Recent?		50.23	4	Data from Apex
Pall Corporation Pilot Test Wells	PT-MW-1S	Recent		14.15	4	Data from Apex
	PT-MW-1I	Recent		55.55	4	Data from Apex
	PT-MW-2S	Recent		14.39	4	Data from Apex
	PT-MW-2I	Recent		55.54	4	Data from Apex
	PT-MW-3S	Recent		12.09	4	Data from Apex
	PT-MW-3I	Recent		56.42	4	Data from Apex
	PT-MW-4S	Recent		14.39	4	Data from Apex
	PT-MW-4I	Recent		55.54	4	Data from Apex
	PT-MW-5S	Recent		14.35	4	Data from Apex
	PT-MW-5I	Recent		56.60	4	Data from Apex
	PT-MW-6S	Recent		14.32	4	Data from Apex
	PT-MW-6I	Recent		54.49	4	Data from Apex

TABLE 2-1
Photocircuits / Pall Corp. Site
Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
August Thomsen	MW-1A	1/23/1992	3-13	12.02	4	
	MW-2A	1/23/1992	3-13	13.05	4	
	MW-2AI	3/23/1999	40-50	49.85	2	Artesian 3/06
	MW-2AD	3/22/1999	80-90 +5	100.25	2	Artesian 3/06
	MW-12PS	8/23/1999	5-15	14.27	2	
	MW-12-PI	8/23/1999	40-50	49.65	2	
	MW-12PD	8/20/1999	85-95	100.70	2	Artesian 3/06
Photocircuits	MW-1	5/12/1987	15-25	No	2	
	MW-2	5/14/1987	10-25*	No	2	
	MW-3	5/13/1987	10-20	No	2	
	MW-4	5/14/1987	14-24	No	2	
	MW-5	5/20/1987	90-100	No	2	
	MW-6	5/13/1987	5.5-15.5	No	2	
	MW-7	8/30/1988	11-26	No	2?	
	MW-8	8/25/1988	155-170	No	2	
	MW-9	8/10/1988	10-25	No	2	
	MW-10	8/12/1988	115-130	No	2	
	MW-11	8/17/1988	160-175	No	2	
	MW-12	10/14/1999	40-50	No	4	
	MW-13	10/15/1999	40-50	No	4	
	MW-14	10/19/1999	45-45	No	4	
Pass & Seymour (Slater Elec.)	MW-1S	1/27/1992	6-21	No	4	
	MW-2S	1/27/1992	6-21	No	4	
	MW-3S	1/27/1992	5-20	No	4	
	MW-4S ***	4/22/1998	4-14	No	4	
Nassua County?	NC-WELL	NA	NA	No	NA	
Sea Cliff Avenue	MW-14PCS	UNK	UNK	23.20	4	Data from Apex
	MW-14PCI	UNK	UNK	49.95	2	Data from Apex
	MW-14PCD	1/4/2000	85-95	90.36	2	
	MW-15PCD	2/22/2000	90-100	99.00	2	
	MW-16PCI	1/6/2000	40-50	49.95	2	
	MW-16PCD	1/6/2000	85-95	96.80	2	
Associated Draperies	MW-1H	Pre-1998	7-27	No	2 or 4	
	MW-2H	Pre-1998	7-27	No	2 or 4	
	MW-1M	NA	19-34	No	2	
Carney Street Well Field	N-3466	NA	148-173	No	NA	
	N-8326 (No. 21)	NA	120-165	No	NA	
	N-8327	NA	115-165	No	NA	
	MW-1GS	NA	TD=23.75	See GC	NA	Duplicate listing?
	MW-1GI	NA	TD=113.5	See GC	NA	Duplicate listing?
	MW-1GD	NA	TD=205	See GC	NA	Duplicate listing?

TABLE 2-1

Photocircuits / Pall Corp. Site

Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
City of Glen Cove	MW-1GS	1/17/2000	5-15	15.13	2 (A)	
	MW-1GI	1/18/2000	40-50	50.15	2 (A)	
	MW-1GD	1/18/2000	85-95	95.00	2 (A)	
	MW-2GS	9/7/1999	5-15	13.90	2 (A)	
	MW-2GI	9/7/1999	40-50	49.65	2 (A)	Artesian 3/06
	MW-2GD	9/7/1999	90-100	NR	2 (A)	Artesian 3/06
Public Supply Well Field Monitoring Wells	GC-1S	NA	19-39	No	NA	
	GC-1D	NA	175-195	No	NA	
	GC-2S	NA	19-39	40.42	NA	
	GC-2D	NA	188-208	216.70	NA	
	GC-3S	NA	4-24	23.53	NA	
	GC-3M	NA	94-114	116.15	NA	
	GC-3D	NA	180-200	203.80	NA	
	GC-4S	NA	34-54	55.45	NA	
	GC-4D	NA	200-220	225.25	NA	
	GC-5S	NA	85-105	115.70	NA	
	GC-5D	NA	234-254	265.60	NA	
	GC-6S	NA	130-150	No	NA	
	GC-6D	NA	255-275	No	NA	
	GC-7S	NA	80-100	No	NA	
	GC-8S	NA	86-106	No	NA	
	GC-8D	NA	169-189	No	NA	
	GC-9S	NA	40-60	113.34	NA	Depth anomaly
	GC-10S	NA	20-40	No	NA	
	GC-11S	NA	95-115	No	NA	
	GC-11D	NA	210-230	No	NA	
	GC-WP1	NA	5-10	No	NA	
Nassau County DPW GW Monitoring Wells	G-4 (N01152)	4/21/1965	125-130	No	4	(Screen 127-130.4)
	G-1A (N05250)	3/8/1967	96-101	No	1.25	
	G-3A (N09670)	4/4/1979	37.25-42.25	No	2	
	SC-2 (N11671)	3/19/1990	19.3-24.3	No	4	Glen Head
	SC-5 (N11675)	4/4/1990	23-28	No	4	Sea Cliff
	SC-7 (N11777)	9/25/1990	68-78	No	4	Sea Cliff

PT = Well to be sampled during pump test only.

Y (Pall) = based on Figure 3-1, this well actually on Pall Corp site

Y (P&S) = based on Figure 3-1, this well actually on Pass and Seymour site.

Y (SCA) = based on Figure 3-1, this well actually on Sea Cliff Avenue.

Y(GZA) = found on figure in GZA FRI report (1999) but not on D&B figures.

* = Well IDs MW-1GS, 1-GI, and 1-GD listed twice on table but shown only once on Figure 3-1; DB Table 4-1 lists Carney St Wells MW-GD1, GD2, GD3, and GD4.

** = Only GC-1 shown on Figure 3-2 (singlet, not GC-1S/1D doublet).

*** = MW-4S shown on figure 3-1 but not on vicinity well table; well log in McLaren-Hart RI, 9/28/98

Boring logs from Enviro-Science except CAR by C A Rich; FDG by Fluor Daniel GTI. Logs for county DPW wells requested but not yet received.

Highlighted data is anomalous (well depth from Enviro-Science sampling log does not match reported well depth).

TABLE 2-2
Photocircuits / Pall Corp. Site
List of Existing Monitoring Wells Included in the Sampling Program

Existing Monitoring Well Construction Details						
Site/Property	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Pall Corporation	MW-1P	1/21/1992	5-15	No	4	
	MW-1PI	3/10/1999	41-51	48.10	2	
	MW-1PD	3/11/1999	90-100	90.61	2	
	MW-4P	1/20/1992	13-23	23.80	4	
	MW-4PI	3/12/1999	45-55	48.35	2	
	MW-4PD	3/16/1999	91-101	101.50	2	
	MW-5P	1/20/1992	3-13	13.30	4	
	MW-5PI	3/17/1999	40-50	48.35	2	
	MW-5PD	3/17/1999	90-100 +5	98.82	2	Artesian 3/06
	MW-6P	8/14/1992	50-60	59.88	4	
	MW-6PD	3/9/1999	90-100	100.95	2	
	MW-10PS	3/19/1999	5-15 +2	15.16	2	
	MW-10PI	3/19/1999	40-50 +5	50.95	2	
	MW-10PD	3/22/1999	90-100 +5	96.59	2	Artesian 3/06
	MW-11PS	8/17/1999	5-15	11.78	2	
	MW-11PI	8/17/1999	40-50	49.95	2	
	MW-11PD	8/16/1999	85-95	96.59	2	Artesian 3/06
	MW-13-PS	9/19/1999	5-15	14.65	2	
	MW-13PI	8/19/1999	40-50	50.23	2	
	MW-13PD	8/18/1999	85-95	94.70	2	
August Thomsen	MW-2A	1/23/1992	3-13	13.05	4	
	MW-2AI	3/23/1999	40-50	49.85	2	Artesian 3/06
	MW-2AD	3/22/1999	80-90 +5	100.25	2	Artesian 3/06
	MW-12PS	8/23/1999	5-15	14.27	2	
	MW-12-PI	8/23/1999	40-50	49.65	2	
	MW-12PD	8/20/1999	85-95	100.70	2	Artesian 3/06
Photocircuits	MW-3	5/13/1987	10-20	No	2	
	MW-7	8/30/1988	11-26	No	2?	
	MW-8	8/25/1988	155-170	No	2	
	MW-9	8/10/1988	10-25	No	2	
	MW-10	8/12/1988	115-130	No	2	
	MW-11	8/17/1988	160-175	No	2	
	MW-12	10/14/1999	40-50	No	4	
Sea Cliff Avenue	MW-14PCD	1/4/2000	85-95	90.36	2	
	MW-15PCD	2/22/2000	90-100	99.00	2	
	MW-16PCI	1/6/2000	40-50	49.95	2	
	MW-16PCD	1/6/2000	85-95	96.80	2	
Carney Street Well Field	MW-1GS	NA	TD=23.75	TBC [2]	NA	Depth uncertain
	MW-1GI	NA	TD=113.5	TBC [2]	NA	Depth uncertain
	MW-1GD	NA	TD=205	TBC [2]	NA	Depth uncertain

TABLE 2-2
Photocircuits / Pall Corp. Site
List of Existing Monitoring Wells Included in the Sampling Program

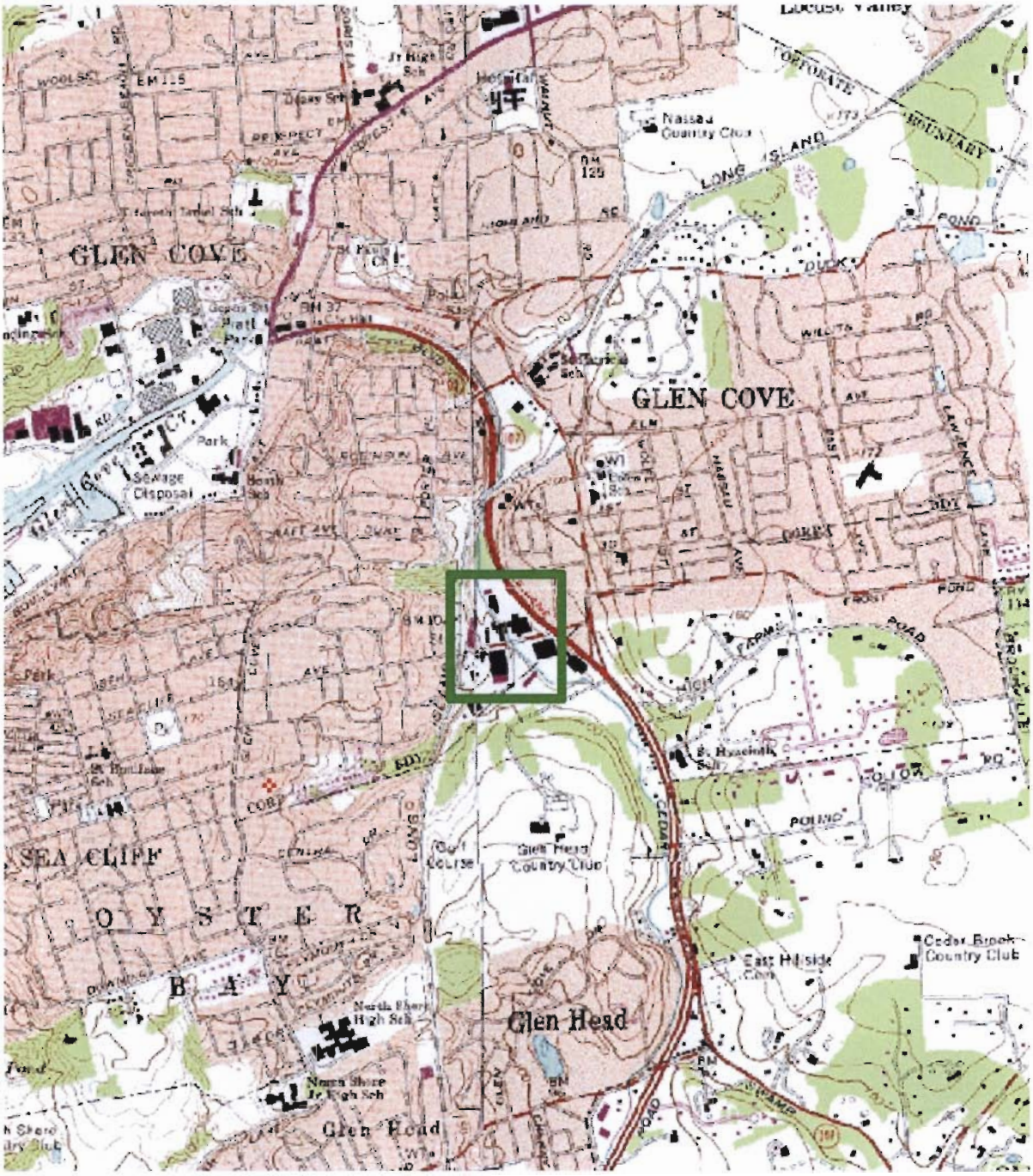
Existing Monitoring Well Construction Details						
Site/Property	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Public Supply Well Field Monitoring Wells	GC-1D	NA	175-195	No	NA	
	GC-2S	NA	19-39	40.42	NA	
	GC-2D	NA	188-208	216.70	NA	
	GC-3S	NA	4-24	23.53	NA	
	GC-3M	NA	94-114	116.15	NA	
	GC-3D	NA	180-200	203.80	NA	
	GC-4S	NA	34-54	55.45	NA	
	GC-4D	NA	200-220	225.25	NA	
	GC-5S	NA	85-105	115.70	NA	
	GC-5D	NA	234-254	265.60	NA	
	GC-10S	NA	20-40	No	NA	
	GC-11S	NA	95-115	No	NA	
	GC-11D	NA	210-230	No	NA	

Notes:
1. List of wells to be sampled will be updated and modified after completion of the well survey task.
2. To be checked during well survey; available well information is contradictory; well logs not yet acquired.

TD = Total Depth
"Well TD" column based on data reported in Apex report (May, 2006).

Table 2-3
Proposed Well Installation and Drilling Summary
Photcircuits/Pall Corp Site Deep Groundwater RI/FS

Hollow Stem Auger Drilling	Proposed Depth (ft)	Rationale
Photocircuits		
01MW-101S	60	Upgradient shallow well, characterize groundwater entering the Study Area
01MW-101D	100	Upgradient deep well, characterize groundwater entering the Study Area
01MW-104S	70	Shallow well near the SVE system, characterize groundwater at Photocircuits
01MW-104I	90	Intermediate well near the SVE system, characterize groundwater at Photocircuits
01MW-104D	130	Deep well near the SVE system, characterize groundwater at Photocircuits
01MW-104D2	160	Very deep well near the SVE system, characterizxe groundwater at Photocircuits
01MW-105D	150	Near SVE area, contingent on hydropunch results
01MW-106D	150	Near SVE area, contingent on hydropunch results
01MW-107D	150	Near SVE area, contingent on hydropunch results
Pall Site		
04MW-102S	60	Shallow well, characterize groundwater entering the Pall Site
04MW-102I	100	Intermediate well, characterize groundwater entering the Pall Site
04MW-102D	140	Deep well, characterize groundwater entering the Pall Site
MW-4PD2	155	Very deep well at existing triplet MW-4P
MW-6PD2	130	Very deep well at existing well triplet MW-15
MW-8PD	130	Deep well at existing doublet at MW-8P
MW-11PD2	155	Very deep well at existing triplet MW-11P
MW-12PD2	155	Very deep well at existing triplet MW-12P
August Thomsen		
MW-2AD2	155	Very deep well at existing triplet MW-2A
Carney St WF		
06MW-103S	80	Shallow well, characterize groundwater near Municipal well #21
06MW-103I	120	Intermediarte well, characterize groundwater near Municipal well #21
06MW-103D	160	Deep well, characterize groundwater near Municipal well #21
06MW-103D2	220	Very deep well, characterize groundwater near Municipal well #21
Hydropunch Drilling/Sampling		
Photocircuits		Comment
01DP-01	150	Stratigraphic characterization of SVE area
01DP-02	150	Stratigraphic characterization of SVE area
01DP-03	150	Stratigraphic characterization of SVE area



LEGEND

SITE LOCAT ON

0.2 0 0.2 0.4

GRAPHIC SCALE

NUMBER	DESCRIPTION	DATE	APPROVED
	REVISIONS		

Prepared by: EarthTech

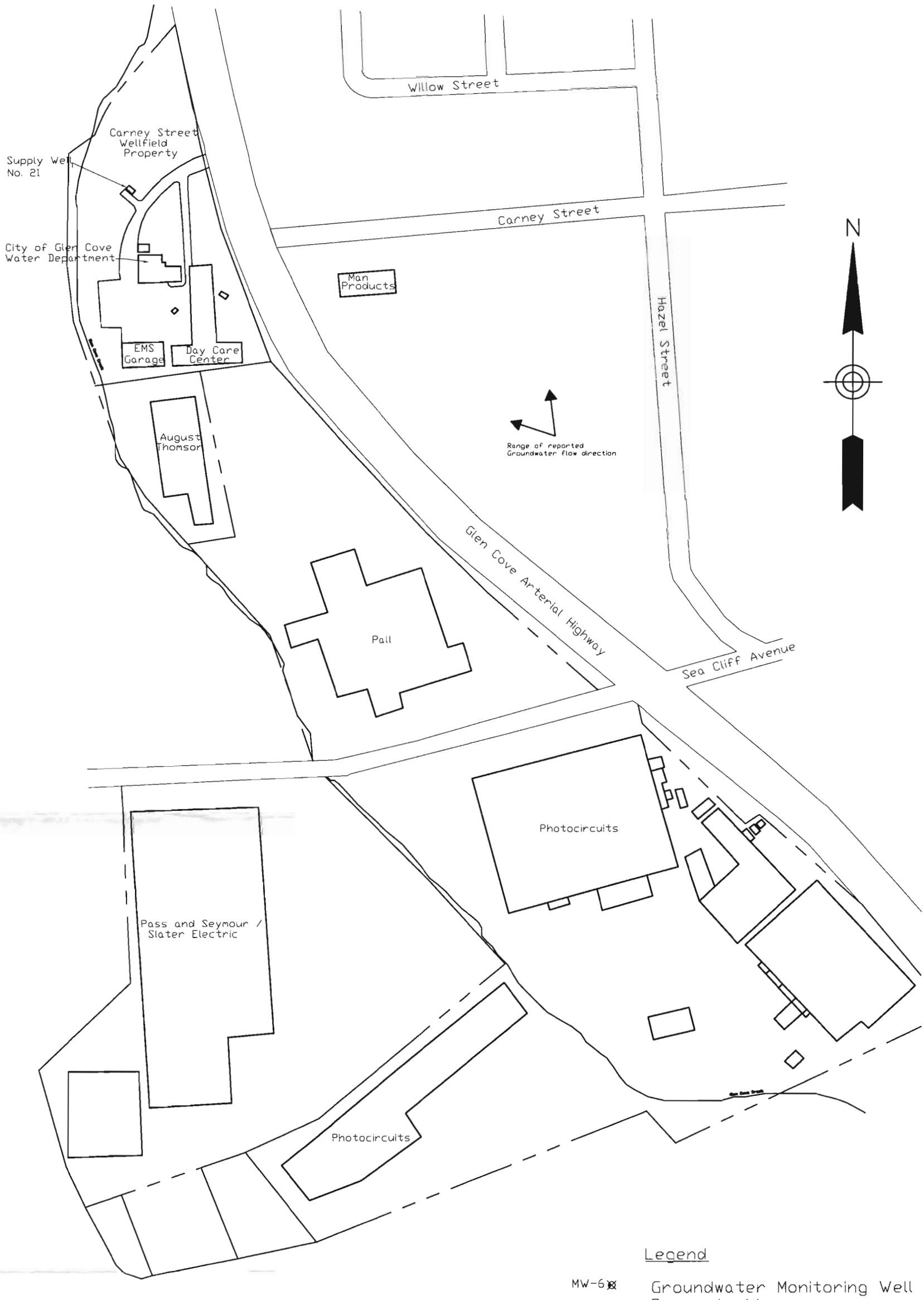
Prepared for: New York State Department of Environmental Conservation

DESIGNED BY	RS
DRAWN BY	RS
CHECKED BY	AB
SUBMITTED BY	AB

Photocircuits / Pall Corp.
GLEN COVE, N.Y.

SITE LOCATION PLAN

DATE	SCALE	DRAWING NO.
SEPTEMBER 2006	AS SHOWN	FIGURE 1



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE:
SITE PLAN

DRAWN BY: MC
CHECKED BY: KS
SCALE: As Shown
DATE: 11/20/06
PROJECT NO. 95636
DRAWING NO.
FIGURE 2

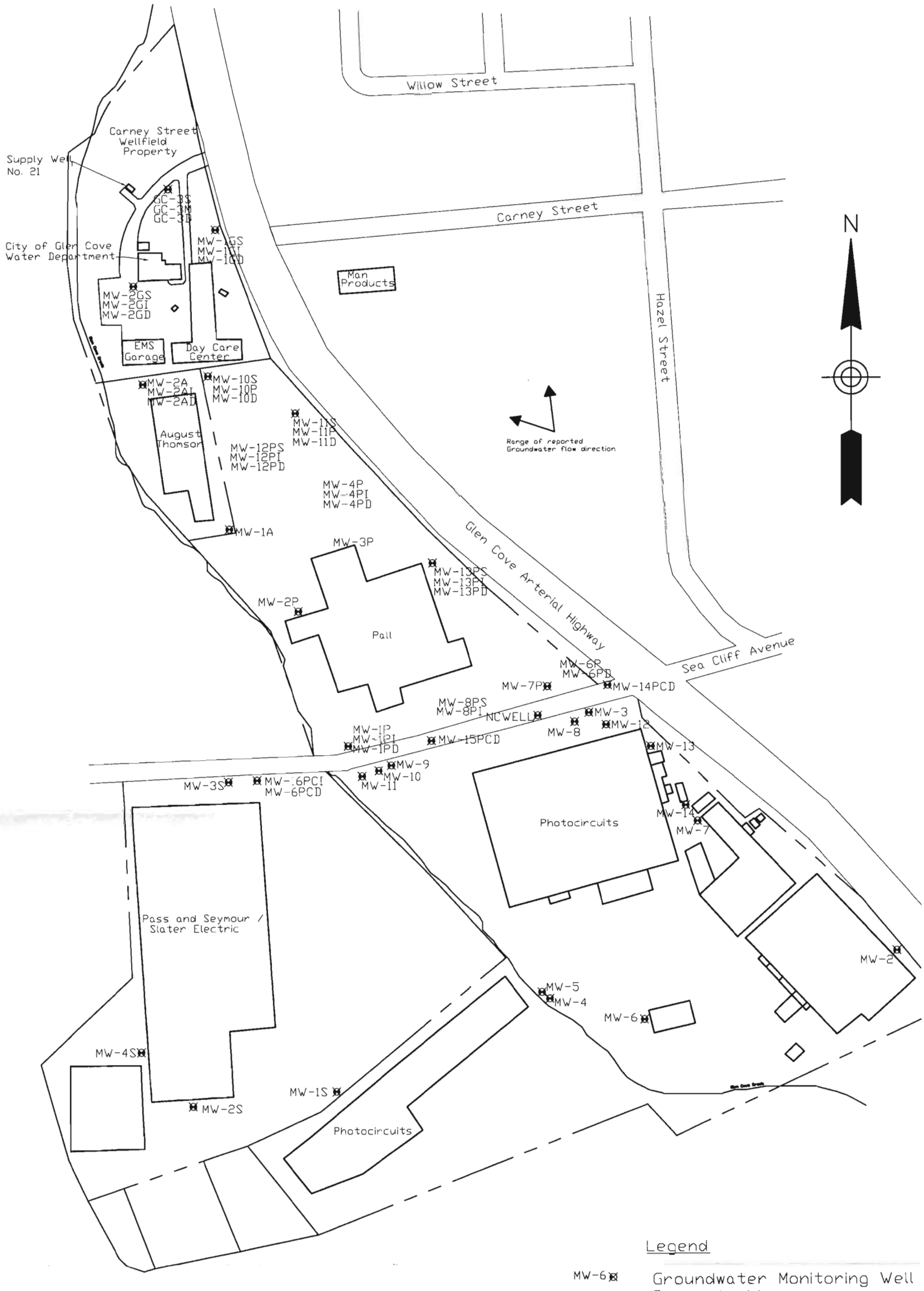
PROJECT:
Photocircuits and Pall Corp.
Glen Cove, New York

CLIENT:
NYSDEC
Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE: ***Existing Monitoring Wells***

DRAWN BY: MC

CHECKED BY: KS

SCALE: As Shown

DATE: 11/20/06

PROJECT NO. 95636

DRAWING NO. ***FIGURE 3***

PROJECT:

Photocircuits and Pall Corp.

Glen Cove, New York

CLIENT:

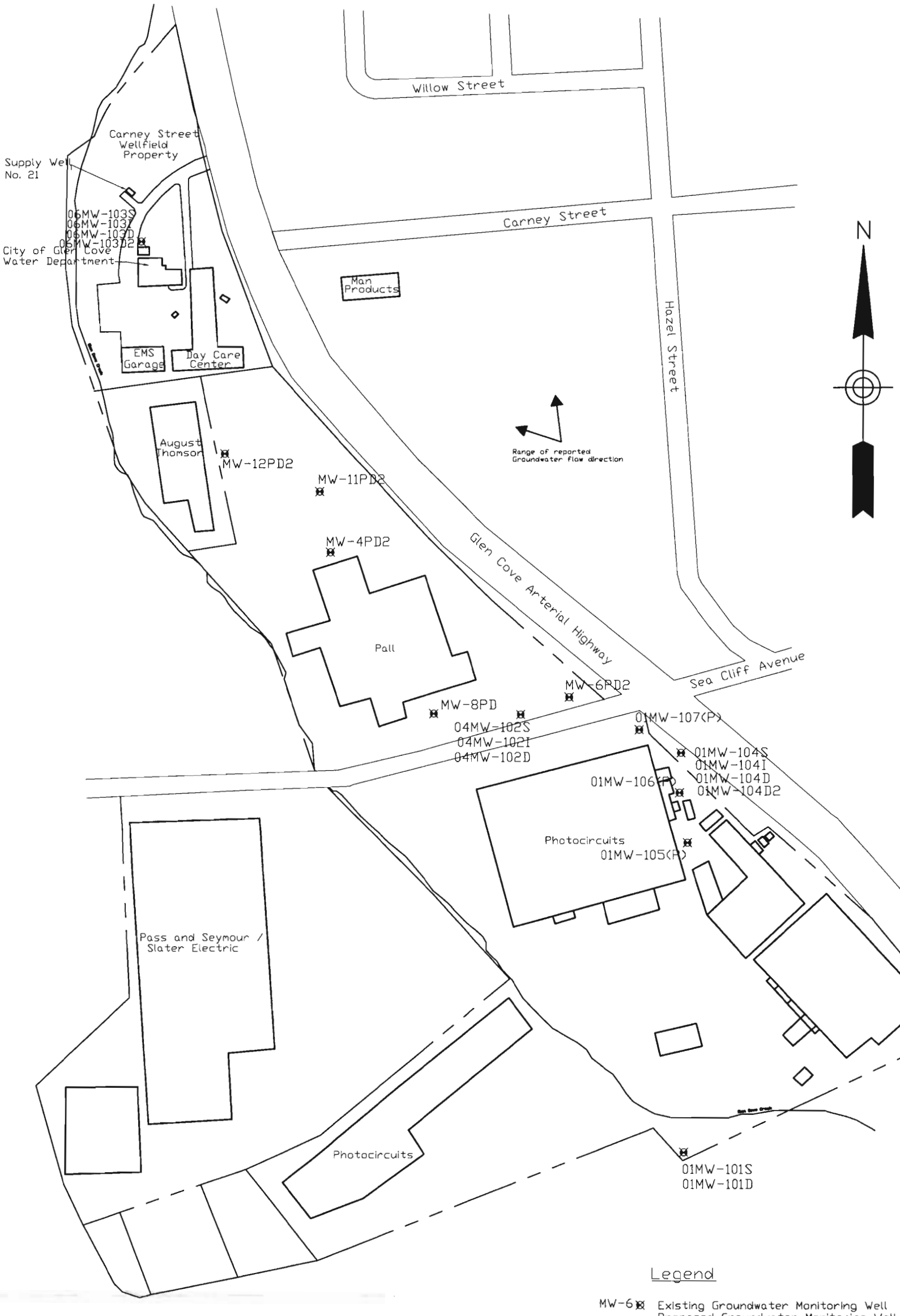
NYSDEC

Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE:
Proposed Monitoring Well Locations

DRAWN BY: MC
CHECKED BY: KS
SCALE: As Shown
DATE: 11/20/06
PROJECT NO. 95636
DRAWING NO.
FIGURE 4

PROJECT:
Photocircuits and Pall Corp.
Glen Cove, New York

CLIENT:
NYSDEC
Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH

EarthTech
A Tyco International Ltd. Company

DIRECT PUSH BORING LOG

Boring No.:

PROJECT:				PAGE 1 OF
PROJECT No.:		CONTRACTOR:		DATE:
LOCATION:		DRILLERS NAME:		ET REP.:
WATER LEVELS		DESIGNATION OF DRILL RIG:		
DATE	TIME	DEPTH	SIZE AND TYPE OF EQUIPMENT:	
			REFERENCE ELEVATION:	DEPTH OF BOREHOLE:
			THICKNESS OF OVERBURDEN:	DISPOSITION OF BOREHOLE:
LABORATORY ANALYSES:				

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

EarthTech
A Tyco International Ltd. Company

BORING LOG

Boring No.: (MW-)

PROJECT:			CONTRACTOR:			PAGE 1 OF	
PROJECT No.:			LOCATION:			DATE:	
SURFACE ELEVATION:			DATUM:	DRILLER:		ET REP.:	
WATER LEVELS			DRILLING AND SAMPLING				
DATE	TIME	DEPTH	CASING		SAMPLER	CORE	TUBE
			TYPE	Steel	split spoon		
			I.D.	6-inch	1 3/8 inch		
			WT./Fall	--	140 lbs.		

Depth (ft)	Sample Number & Time	Blows per/6"	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

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A tyco International Ltd. Company

WELL NO. MW-

WELL DEVELOPMENT FORM	PROJECT	SHEET OF SHEETS
1. LOCATION	4. DATE WELL STARTED	5. DATE WELL COMPLETED
2. COMPANY	6. NAME OF INSPECTOR	
3. DRILLING COMPANY	7. SIGNATURE OF INSPECTOR	

ONE WELL VOLUME: WELL TD: PUMP INTAKE:

Time	Depth to Water (ft)	Purge Rate (gpm)	FIELD MEASUREMENTS				REMARKS
			Temp. (C)	Conduct. (ms/cm)	pH	Turbidity (ntu)	

Take a photo at completion

Pump Type:

Analyses:

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WELL NO.

WELL SAMPLING FORM	PROJECT	PROJECT No.	SHEET / SHEETS OF
LOCATION		DATE WELL STARTED	DATE WELL COMPLETED
CLIENT		NAME OF INSPECTOR	
DRILLING COMPANY		SIGNATURE OF INSPECTOR	

ONE WELL VOLUME : WELL TD: PUMP INTAKE DEPTH:

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	
									Static water level
									pump on

Pump Type: _____

Analytical Parameters: _____

INVESTIGATION-DERIVED WASTE LOG SHEET

Job Name and ET Number **Location**

Site

Inventory Date: _____ **No. of Drums:**

Waste Source	Drum ID Number	Date Generated	Cross Reference to Specific Sample	Contents (solid / liquid)	Approx. Volume	Drum Location / Comments	Date Moved to Staging Area	Date Removed From Staging Area	Final Disposition

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A Tyco International Ltd. Company

EQUIPMENT CALIBRATION LOG SHEET - RAE Systems MultiRAE Plus

Project:

Meter:

Date	By (Initials)	10.6 Lamp Reading	O_2 Reading	LEL Reading	CO Reading	H_2S Reading	Adjustment Required?	Battery OK?	Comments

Cal sheets-air.xls.xls MultiRAE plus

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A Tyco International Ltd. Company

EQUIPMENT CALIBRATION LOG SHEET - Dissolved Oxygen Meter

Project:

Meter:

Date	By (Initials)	DO Calibration Temperature		Adjustment Required?	Battery OK?	Membrane Replacement?	Comments
		Temp	DO (Table or %)				

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A Tyco International Ltd. Company

EQUIPMENT CALIBRATION LOG SHEET - pH Meter

Project:

Meter:

Date	By (Initials)	pH Buffer Initial Reading			Adjustment Required?	Battery OK?	Comments
		4	7	10			

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A Tyco International Ltd. Company

EQUIPMENT CALIBRATION LOG SHEET - Conductivity Meter

Project:

Meter:

Date	By (Initials)	Calibrant Used (µMHO)		Meter Reading (µMHO)		Adjustment Required?	Battery OK?	Comments
		1,000	10,000	1,000	10,000			

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A Tyco International Ltd. Company

EQUIPMENT CALIBRATION LOG SHEET - Turbidity Meter

Project:

Meter:

Date	By (Initials)	Calibrant Used (NTU)		Meter Reading (NTU)		Adjustment Required?	Battery OK?	Comments
		0	40 (or other)	0	40 (or other)			

Cal sheets-water.xls.xls Turbidity

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A Tyco International Ltd. Company

EQUIPMENT CALIBRATION LOG SHEET - Oxidation Reduction Potential Meter

Project:

Meter:

Date	By (Initials)	Calibrant Used		Meter Reading	Adjustment Required?	Battery OK?	Comments
		237	Other				

WORK PLAN APPENDIX B
QUALITY ASSURANCE PROJECT PLAN (QAPP)
DRAFT (80 Percent Submission)

Photocircuits/Pall Corp
OU2 (Deep Groundwater) RI/FS

Photocircuits (#130009),
Pall Corp (#130053B)

Work Assignment No. D004436-04

Prepared for:

SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
625 Broadway
Albany, New York 12233

November 2006

Prepared by:

Earth Tech Northeast, Inc.
300 Broadacres Drive
Bloomfield, New Jersey

Photocircuits/Pall Corp Deep Groundwater RI/FS
Quality Assurance Project Plan (Work Plan Appendix B)
Table of Contents

Tables

Figures

1 QUALITY ASSURANCE PROJECT PLAN - INTRODUCTION

1.1 PURPOSE AND OBJECTIVE

The purpose of this Quality Assurance Project Plan (QAPP) is to document planned investigative activities and establish the criteria for performing these activities at a predetermined quality for the remedial investigation and feasibility study (RI/FS) for the deep groundwater (Operable Unit [OU] 2) at the Pall Corporation and Photocircuits Sites in Glen Cove, Nassau County, New York. The Pall Site, 30-36 Sea Cliff Avenue, is a New York State Department of Environmental Conservation (NYSDEC) Class 2 Inactive Hazardous Waste Site, Site Code 1-30-053B, and for the purpose of this investigation also includes the August Thomsen site (36 Sea Cliff Avenue, formerly owned by Pall Corp). The Photocircuits Site, 45 Sea Cliff Avenue, is NYSEC Class 2 Site 1-30-009; for the purpose of this investigation it also includes the former Pass and Seymour Site (NYSDEC Site ID 1-30-053A), which is currently occupied by Photocircuits. The work is being completed by Earth Tech under NYSDEC Superfund Standby Contract Investigation/Design Engineering Services Work Assignment No. D004436-05.

Project work will be conducted in general accordance with the United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988), TAGM #4030, Selection of Remedial Activities at Inactive Hazardous Waste Sites, and NYSDEC Draft DER-10, Technical Guidance for Site Investigation and Remediation (NYSDEC, 2002).

The objective of the RI is to provide a sufficient characterization of the nature and extent of deep groundwater contamination in the vicinity of the Pall and Photocircuits sites, including its impact and relationship to groundwater at the currently inactive Carney Street Wellfield, due north of Pall and Photocircuits. The onsite and off-site data generated for the RI will be used to complete a feasibility study, which will identify and evaluate alternatives available for remediation of the deep groundwater and will be used as the basis for final selection of the appropriate remedial response. A site location plan is included as Figure 1, and a site plan is provided as Figure 2.

1.2 PROJECT MANAGEMENT AND ORGANIZATION

1.2.1 Personnel

The general responsibilities of key project personnel are listed below, and an organization chart is provided as Figure 3.

Project Advisor – Mike Thiagaram, P.E. (Earth Tech), Program Manager, will have responsibility for overall program management and coordination of subcontractors to complete the work.

Project Manager – Mr. Allen Burton (Earth Tech), will have responsibility for overall project management and coordination with NYSDEC, and along with the RI Task Leader will coordinate the initiation and implementation of the Task 2 activities.

RI Task Leader and Field Team Leader – Mr. Paul Kareth (Earth Tech), will share the responsibility of implementing and coordinating the Remedial Investigation (Task 2) project activities, and will have day-to-day responsibility for on-site implementation of the Remedial Investigation (Task 2) project activities.

FS Task Manager – TBD (Earth Tech), will be responsible for management, coordination and implementation of the Task 3 Feasibility Study.

QA Officer – Mr. Chris Taylor (Earth Tech) will serve as Quality Assurance Officer, and. will be responsible for oversight of the data validation and laboratory subcontractors, as well as data usability reports.

H & S Officer – Mr. Bob Poll (Earth Tech) will be responsible for oversight of the preparation of the project health and safety plan, approving it, and tracking of its implementation.

Community Participation Coordinator – Ms. Karen Coghlan (Earth Tech) will oversee the preparation of Participation the community participation plan and its implementation.

Resumes for most of the Earth Tech personnel have previously been submitted to the Contract Development Section.

1.2.2 Specific Tasks and Services

Earth Tech has obtained standby subcontractor specialists for services relating to drilling and monitoring well installation, laboratory/analytical services, data validation services, and field surveying. The planned subcontractors for utilization for the RI/FS are:

Laboratory Analysis – TBD

Data Validation – TBD

Utility Clearance/Geophysical Survey – TBD

Drilling and Monitoring Well Installation – TBD

Hydropunch Sampling - TBD

Surveying - YEC, Inc.

1.3 SITE DESCRIPTION AND LOCATION

Background data on the site, including the site description and location, site history, previous investigations, and current conditions, are summarized in the Field Activities Plan (FAP; sections 1.2 through 1.5) and not repeated here.

2 SITE INVESTIGATION

A list of all the known wells (monitoring and other wells) in the site vicinity is provided as Table 1; Table 2 lists the wells to be sampled. The expected number of samples for each matrix (including the frequency of QC samples) is provided in Table 3.

2.1 Field Sampling Procedures

Field activities are detailed in the Field Activities Plan and not repeated here.

2.2 Equipment Decontamination

To avoid cross contamination, sampling equipment (defined as any piece of equipment which may contact a sample) will be decontaminated according to the following procedures specified in the FAP (Section 2.11) and not repeated here.

3 SAMPLE HANDLING

3.1 SAMPLE IDENTIFICATION AND LABELING

Samples will be assigned a unique identification using the sample location or other sample-specific identifier. Sample identification may be limited to a specific number of alphanumeric characters to be consistent with the limitations of the laboratory tracking/reporting software. The general sample identification format follows.

Due to the overlap and similar numbering of wells on different properties, existing (and new) monitoring wells are identified by an initial two-digit code which indicates the property or area on which the well is located (see FAP, section 3.4). For existing monitoring wells, the remainder of the existing well ID is retained. For example, MW-13 at Photocircuits is referenced as 01MW-13.

New wells added to existing clusters will include the sample location code but retain the original numbering sequence (see Table 2). Where there is already a deep well (typically, an existing triplet consisting of a shallow ["S" suffix], intermediate [I], and deep [D] wells), the new (proposed) deep well be "D2". For example, the new deep well at location MW-2A (on the August Thomsen property) will be designated as 05MW-2AD2.

New well clusters will include the location code, "MW", and then be numbered sequentially beginning with 101. (Numbers will not be re-used on multiple properties; for example, if there is a well 01MW-101 on the Photocircuits property, there will not be a well 0xMW-101 on any other property; the next well will be 0xMW-102, regardless of which property on which it is located.) Well suffixes (S, I, D, D2) will continue to indicate relative depth.

FB = Field (Equipment Rinsate) Blank

TB = Trip Blank

XX = Numerical sample identifier (up to five characters). This will ordinarily be the number of the monitoring well from which the sample was obtained.

QC field duplicate samples will be submitted blind to the laboratory; a fictitious sample ID will be created using the same system as the original by adding 50 to the original well ID (e.g., 01MW-151S would be a field duplicate of 01-MW-101S). The sample identifications (of the original sample and its field duplicate) will be marked in the field book and on the copy of the chain-of-custody kept by the sampler and copied to the project manager. All sample containers will be labeled in the field prior to the collection of samples. Affixed to each sampling container will be a non-removable label on which the following information will be recorded with permanent water-proof ink:

- Site name, location, and job number;
- Sample identification code;
- Date and time;
- Sampler's name;
- Preservative;
- Type of sample (e.g., water, soil, sludge, sediment); and,
- Requested analyses.

3.2 SAMPLE. BOTTLES, PRESERVATION, AND HOLDING TIME

Table 4 specifies the analytical method, matrix, holding time, containers, and preservatives for the various analyses to be completed as part of the RI. Sample bottle requirements, preservation, and holding times are discussed further below.

3.2.1 Sample Bottles

The selection of sample containers used to collect samples is based on the criteria of sample matrix, analytical method, potential contaminants of concern, reactivity of container material with the sample, QA/QC requirements and any regulatory protocol requirements.

Sample bottles will be provided by the analytical laboratory and will conform to the requirements of USEPA's Specifications and Guidance for Contaminant-Free Sample Containers. Aqueous samples for volatile organic compound (VOC) analysis will be collected in 40-mL vials with teflon septa.

3.2.2 Sample Preservation

Samples will be preserved as indicated below and summarized on Table 4.

Aqueous Samples:

Volatile organics - cooled to 4 °C; HCl added to pH $\leq$ 2.

Chemical preservatives will be added to the sample bottles (prior to sample collection) by the analytical laboratory. The pH of samples will be spot-checked in the field and additional preservative will be added as needed. Sample preservation is checked upon sample receipt by the laboratory; this information is reported to the Earth Tech Quality Assurance Officer (QAO). If it appears that the level of chemical preservation added is not adequate, laboratory preservative preparation and addition will be modified or additional preservative will be added in the field by the sampling team.

3.2.3 Holding Times

Holding times are judged from the validated time of sample receipt (VTSR) by the laboratory; samples will be shipped from the field to arrive at the lab no later than 48 hours from the time of sample collection. Holding time requirements will be those specified in the NYSDEC ASP 2000; it should be noted that for volatile organics analyses, these holding times are more stringent than the holding time NYSDEC 2004 ASP Laboratory Certification Manual.

Although trip blanks are prepared in the analytical laboratory and shipped to the site prior to the collection of environmental samples, for the purposes of determining holding time conformance, trip blanks will be considered to have been generated on the same day as the environmental samples with which they are shipped and delivered. Procurement of bottles and blanks will be scheduled to prevent trip blanks from being stored for excessive periods prior to their return to the laboratory; the goal is that trip blanks should be held for no longer than one week prior to use.

3.3 CHAIN OF CUSTODY AND SHPPING

A chain-of-custody form will trace the path of sample containers from the project site to the laboratory. A sample Chain of Custody is included in Appendix C, Field Forms.

Sample bottle tracking sheets or the chain-of-custody will be used to track the containers from the laboratory to the containers' destination. The project manager will notify the laboratory of upcoming field sampling events and the subsequent transfer of samples. This notification will include information concerning the number and type of samples, and the anticipated date of arrival. Insulated sample shipping containers (typically coolers) will be provided by the laboratory for shipping samples. All sample bottles within each shipping container will be individually labeled with an adhesive identification label provided by the laboratory. Project personnel receiving the sample containers from the laboratory will check each cooler for the condition and integrity of the bottles prior to field work.

Once the sample containers are filled, they will be immediately placed in the cooler with ice (in Ziploc plastic bags to prevent leaking) or synthetic ice packs to maintain the samples at 4° C. The field sampler will indicate the sample designation/location number in the space provided on the chain-of-custody form for each sample. The chain of custody forms will be signed and placed in a sealed plastic Ziploc bag in the cooler. The completed shipping container will be closed for transport with nylon strapping, or a similar shipping tape, and two paper seals will be affixed to the lid. The seals must be broken to open the cooler and will indicate tampering if the seals are broken before receipt at the laboratory. A label may be affixed identifying the cooler as containing "Environmental Samples" and the cooler will be shipped by an overnight delivery service to the laboratory. When the laboratory receives the coolers, the custody seals will be checked and lab personnel will sign the chain-of-custody form.

4 DATA QUALITY REQUIREMENTS

4.1 ANALYTICAL METHODS

Analyses for volatile organic compounds will utilize USEPA SW-846 Methods:

Volatile Organics - SW-846 Method 8260B

Analytical methods used during this project are presented in the NYSDEC Analytical Services Protocol (ASP), 2000. It is the laboratory's responsibility to be familiar with this document and procedures and deliverables within it pertaining to New York State Superfund work. For this RI, full Category B deliverables will be required.

Earth Tech will obtain analytical laboratory services under subcontracts approved by NYSDEC. For the Photocircuits/Pall Deep Groundwater (OU2) RI/FS, a single laboratory (TBD) will be utilized. The proposed laboratory will be certified by the NYSDOH Environmental Laboratory Approved Program (ELAP ID #xxxxx) for superfund category volatile organics. TBD was confirmed to be in good standing for the applicable ASP/CLP parameter groups.

4.2 QUALITY ASSURANCE OBJECTIVES

Data quality objectives (DQOs) for measurement data in terms of sensitivity and the PARCC parameters (precision, accuracy, representativeness, comparability, and completeness) are established so that the data collected are sufficient and of adequate quality for their intended uses. Data collected and analyzed in conformance with the DQO process described in this QAPP will be used in assessing the uncertainty associated with decisions related to this site.

4.2.1 Sensitivity

The sensitivity or detection limit desired for each analysis or compound is based on the DQOs established for the project. In order to adequately assess contaminant migration and potential degradation products, and also for comparability with existing data (e.g., data presented in RI reports for Pall and Photocircuits), a reporting limit (RL) goal of 1 µg/L has been established for the contaminants of concern (chlorinated solvents, especially TCE, PCE, 1,2-DCE, and 1,1,1-TCA). USEPA Method SW-846 Method 8260B with a 25 mL purge volume can meet this goal; as the low level calibration standard is set to 1 µg/L, and the method detection limits (MDLs) typically a factor of five or ten lower than the RL.

The RL for nondetected analytes will be the lowest calibration standard associated with the analysis. Analytes detected analytes at concentrations below the RL but above the MDL will be flagged "J" (estimated) by the laboratory.

4.2.2 Precision

The laboratory objective for precision is to equal or exceed the precision demonstrated for the applied analytical methods on similar samples. Precision is evaluated by the analyses of laboratory and field duplicates. Matrix spike duplicate analyses will be performed once for every 20 samples for VOCs.

Relative Percent Difference (RPD) criteria, prescribed by the NYSDEC, and those determined from laboratory performance data, are used to evaluate precision between duplicates. A matrix spike duplicate will be performed once for every twenty samples for volatile organics.

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. Precision is usually stated in terms of standard deviation but other estimates such as the coefficient of variation, relative standard deviation, range (maximum value minus minimum value), and relative range are common, and may be used pending review of the data.

The overall precision of measurement data is a mixture of sampling and analytical factors. Analytical precision is easier to control and quantify than sampling precision; there are more historical data related to individual method performance and the "universe" is not limited to the samples received in the laboratory. In contrast, sampling precision is unique to each site or project.

Overall system (sampling plus analytical) precision will be determined by analysis of field duplicate samples. Analytical results from laboratory duplicate samples will provide data on measurement (analytical) precision.

Precision will be determined from field duplicates, as well as laboratory matrix duplicate samples for metals analyses, and matrix spikes and matrix spike duplicates for organic analyses; it will be expressed as the relative percent difference (% RPD):

$$\% \text{ RPD} = 100 \times 2(X_1 - X_2) / (X_1 + X_2)$$

where:

X_1 and X_2 are reported concentrations for each duplicate sample and subtracted differences represent absolute values.

Criteria for evaluation of laboratory duplicates are specified in the applicable methods. The objective for field duplicate precision is ≤ 50% RPD for all matrices for analytes detected at concentrations at least 2× the reporting limit. Where on or both analytes are detected at less than 2 x the RL, the criterion

4.2.3 Accuracy

The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for the applied analytical method on similar samples. Percent recovery criteria, published by the NYSDEC as part of the ASP, and those determined from laboratory performance data, are used to evaluate accuracy in matrix (sample) spike and blank spike quality control samples. A matrix spike and blank spike will be performed once for every sample delivery group (SDG) as specified in the ASP-CLP. This will apply to inorganics and volatile and semivolatile organics analyses. Other method-specific laboratory QC samples (such as laboratory control samples for metals, and continuing calibration standards) may also be used in the assessment of analytical accuracy. Sample (matrix) spike recovery is calculated as:

% Recovery = 100 × (SSR-SR)/SA

Where:

SSR = Spiked sample Result

SR = Sample Result, and

SA = Spike Added

Accuracy measures the bias in a measurement system. It is difficult to measure accuracy for the entire data collection activity. Accuracy will be assessed through use of known QC samples. Accuracy values can be presented in a variety of ways. Accuracy is most commonly presented as percent bias or percent recovery. Percent bias is a standardized average error, that is, the average error divided by the actual or spiked concentration and converted to a percentage. Percent bias is unitless and allows accuracy of analytical procedures to be compared.

Percent recovery provides the same information as percent bias. Routine organic analytical protocol requires a surrogate spike in each sample. Surrogate recovery will be defined as:

% Recovery = (R/S) x 100

Where:

S = surrogate spike concentration

R = reported surrogate compound concentration

Recovery criteria for laboratory spikes and other laboratory QC samples through which accuracy may be evaluated are established in the applicable analytical method.

4.2.4 Representativeness

The representativeness of data is only as good as the representativeness of the samples collected. Sampling and handling procedures, and laboratory practices are designed to provide a standard set of performance-driven criteria to provide data of the same quality as other analyses of similar matrices using the same methods under similar conditions. Representativeness will be determined by a comparison of the quality controls for these samples against data from similar samples analyzed at the same time.

4.2.5 Comparability

Comparability of analytical data among laboratories becomes more accurate and reliable when all labs follow the same procedure and share information for program enhancement. Some of these procedures include:

- Instrument standards traceable to National Institute of Standards and Technology (NIST), the US Environmental Protection Agency (EPA), or the New York State Departments of Health or Environmental Conservation;
- Using standard methodologies;
- Reporting results for similar matrices in consistent units;
- Applying appropriate levels of quality control within the context of the laboratory quality assurance program; and,
- Participation in inter-laboratory studies to document laboratory performance.

By using traceable standards and standard methods, the analytical results can be compared to other labs operating similarly. The QA Program documents internal performance. Periodic laboratory proficiency studies are instituted as a means of monitoring intra-laboratory performance.

Comparability within the RI/FS is also assessed by comparison of the RI/FS data to data generated previously; and also be comparison of the data for the two sampling events planned for this RI/FS. Comparability (consistency) of sampling techniques is also assessed, to some extent, by analysis of field duplicates; although it should be noted that large differences between field duplicates may result from a wide variety of causes, not just inconsistent sampling.

4.2.6 Completeness

The goal of completeness is to generate the maximum amount possible of valid data for all planned samples. Completeness of 100 percent indicates that all planned samples were collected; and the resultant data were fully valid and acceptable. As completeness is a function of both field activities and laboratory activities, separate completeness goals are established for each.

The goal for sampling completeness is 95 percent, as is calculated as

Sampling Completeness (%) = (Sc/Sp) × 100

Where:

Sc = Samples collected (submitted) for analysis (as documented from field records or COC)

Sp = Samples planned (as documented in the FAP or QAPP)

The goal for analytical completeness is also set at 95 percent. Analytical completeness may be less than 100 percent either due to systemic failures that result in the rejection or loss of data for an entire sample; or compound-specific rejection (e.g., 2-hexanone) within an otherwise valid analysis.

For this RI, the overall completeness goal is 90 percent useable data. The impact of rejected or unusable data will be made on a case-by-case basis. If the RI/FS can be completed without the missing datum or data, or if data from a different sampling event can be used to fill the data gap, no further action would be necessary. However, loss of critical data may require resampling or reanalysis.

4.3 FIELD OUALITY ASSURANCE

Blank water generated for use during this project must be "demonstrated analyte-free". The criteria for analyte-free water is based on the USEPA-assigned values for the Contract Required Quantitation Limits (CRQLs).

Volatile organics < 1 µg/L

However, specifically for the common laboratory contaminants (acetone and 2-butanone), the allowable limits are five times the CRQL. For methylene chloride, the limit is 2.5 times the CRQL.

The analytical testing required for the water to be demonstrated as analyte-free must be performed prior to the start of sample collection; thus, blank water will be supplied by the laboratory.

4.3.1 Equipment (Rinsate) Blanks

Equipment blanks consist of demonstrated, analyte-free water that show if sampling equipment has the potential for contaminant carryover to give a false impression of contamination in an environmental sample. When blank water is used to rinse a piece of sampling equipment (before it is used to sample), the rinsate is collected and analyzed to see if sampling could be biased by contamination from the equipment.

Field Equipment (Rinsate) blanks for bailers: For initial sampling, as well as at subsequent rounds of sampling when bailers are reused, at least one of the bailers used per decontamination batch, will be used to generate equipment (rinsate) blanks during groundwater sampling. Disposable bailers will be obtained from a single vendor for this project. One rinsate blank will be collected for each groundwater sampling event.

One rinsate blank will be collected for every 20 Geoprobe samples collected or one per week whichever is more frequent. The rinsate blanks will be collected from the Geoprobe soil sampler and Geoprobe groundwater sampling equipment.

4.3.2 Field Duplicate Samples

Field duplicate samples are used to assess the variability of a matrix at a specific sampling point and to assess the reproducibility of the sampling method. Aqueous field duplicate samples are second samples collected from the same location, at the same time, in the same manner as the first, and placed into a separate container (technically, these are co-located samples). Each duplicate sample will be analyzed for the same parameters as the original sample collected that day.

The blind field duplicate Relative Percent Difference (RPD) objective will be ≤50% percent RPD for all matrices. Field duplicates will be collected at a frequency of one per 20 environmental samples for both matrices (aqueous and non-aqueous) and all test parameters.

4.3.3 Split Samples

Split samples are used for performance audits or inter-laboratory comparability of data. A split sample will be defined as at least two separate sub-samples taken from a single original sample which has been thoroughly mixed or homogenized prior to the formation of the split samples. The exception to this is samples for volatile organics analysis which will not be homogenized. Collection of split samples is not planned.

4.3.4 Trip Blanks

The purpose of a VOC trip blank (using demonstrated analyte-free water) is to place a mechanism of control on sample bottle preparation and blank water quality, and sample handling. The trip blank travels from the lab to the site with the empty sample bottles and back from the site with the collected samples. There will be a minimum of one trip blank per shipment containing aqueous samples for VOC analysis.

Trip blanks will be collected only when aqueous volatile organics are being sampled and shipped; except that a trip blank is not required when the only aqueous samples in a shipment are QC samples (rinsate blanks).

4.4 FIELD TESTING QC

Field testing of groundwater will be performed during purging of wells prior to sampling for laboratory samples. Field QC checks of control limits for pH, specific conductance (conductivity) and turbidity are detailed below. The calibration frequencies discussed below are the minimum. Field personnel can and should check calibration more frequently in adverse conditions, if anomalous readings are obtained, or subjective observations of instrument performance suggest the possibility of erroneous readings. Calibration logs for the instruments discussed below are provided in Appendix A of the FAP.

4.4.1 pH Meter

The pH meter is calibrated daily, using two standards bracketing the range of interest (generally 4.0 and 7.0). If the pH QC control sample (a pH buffer, which may be the same or different than those used to initially calibrate the instrument) exceeds 0.1 pH units from the true value, the source of the error will be determined and the instrument recalibrated. If a continuing calibration check with pH 7.0 buffer is off by more than 0.1 pH units, the instrument will be recalibrated. Expired buffer solutions will not be used.

Note that gel-type probes take longer to equilibrate (up to 15 minutes at near-freezing temperatures); this must be taken into account in calibrating the instrument and reading samples and standards.

4.4.2 Specific Conductivity

A vendor-provided conductivity standard will be used to check the calibration of the conductivity meter daily. Specific conductance QC samples will be on the order of 0.01 or 0.1 molar potassium chloride (KCl) solutions in accordance with manufacturer's recommendations.

4.4.3 Turbidity

The turbidity meter should be calibrated using a standard as close as possible to 50 NTU (the critical value for determining effectiveness of well development and evacuation). The turbidimeter will be checked daily. The turbidity QC sample will be a commercially prepared polymer standard (Advanced Polymer System, Inc., or similar).

4.4.4 Temperature

Temperature probes associated with instruments (such as the YSI SCT-33 conductivity and temperature meter) are not subject to field calibration, but the calibration should be checked to

monitor instrument performance. It is recommended that the instrument's temperature reading be checked against a NIST-traceable thermometer concurrently with checking the conductivity calibration. The instrument manual will be referenced for corrective actions if accurate readings cannot be obtained.

4.5 LABORATORY QUALITY ASSURANCE

4.5.1 Method Blanks

A method blank is laboratory water on which every step of the method is performed and analyzed along with the samples. They are used to assess the background variability of the method and to assess the introduction of contamination to the samples by the method, technique, or instruments as the sample is prepared and analyzed in the laboratory. Method blanks will be analyzed at a frequency of one for every twenty samples analyzed or as otherwise specified in the analytical protocol.

4.5.2 Laboratory Duplicates

Laboratory duplicates are sub-samples taken from a single aliquot of sample after the sample has been thoroughly mixed or homogenized (with the exception of volatile organics), to assess the precision or reproducibility of the analytical method on a sample of a particular matrix. Laboratory duplicates will be performed on spiked samples as a matrix spike and a matrix spike duplicate (MS/MSD) for volatile organics.

4.5.3 Spiked Samples

Two types of spiked samples will be prepared and analyzed as quality controls: matrix spikes and matrix spike duplicates (MS/MSD) are analyzed to evaluate instrument and method performance and performance on samples of similar matrix. MSMSD will be analyzed at a frequency of one (pair) for every 20 samples. In addition, matrix spike blanks (MSBs) will also be prepared and analyzed by the laboratory as required by NYSDEC ASP.

5 FIELD DATA DOCUMENTATION

Field reporting documentation, including field logbooks and field data reporting forms, is discussed in FAP Section 3, especially sections 3.1 and 3.2, and not repeated here.

6 EQUIPMENT CALIBRATION AND MAINTENANCE

6.1 STANDARD WATER AND AIR QUALITY FIELD EQUIPMENT

Field equipment used during the collection of environmental samples includes a turbidimeter (turbidity per EPA Method 180.1), pH meter (pH per EPA Method 150.1), conductivity meter (specific conductance per EPA Method 120.1), thermometer, and photoionization detector. See also Section 4.4 of this QAPP for additional discussion.

The organic vapor analyzer (MultiRAE, HNu-PI 101, or equivalent organic vapor analyzer) used for soil screening and health and safety air monitoring will be calibrated following the manufacturer's instructions, at the beginning of the day, whenever the instrument is shut off for more than two hours, and at the field technician's discretion.

6.2 LABORATORY EQUIPMENT

Laboratory equipment will be calibrated according to the requirements of the 2000 NYSDEC ASP, Exhibit E, Part IV, and maintained following professional judgment and the manufacturer's specifications, and additional requirements as specified in the 2004 ELAP certification manual.

7 CORRECTIVE ACTIONS

If instrument performance or data fall outside acceptable limits, then corrective actions will be taken. These actions may include recalibration or standardization of instruments, acquiring new standards, replacing equipment, repairing equipment, and reanalyzing samples or redoing sections of work.

Subcontractors providing analytical services should perform their own internal laboratory audits and calibration procedures with data review conducted at a frequency so that errors and problems are detected early, thus avoiding the prospect of redoing large segments of work.

Situations related to this project requiring corrective action will be documented and made part of the project file. For each measurement system identified requiring corrective action, the responsible individual for initiating the corrective action and also the individual responsible for approving the corrective action, if necessary, will be identified.

As part of its total quality management program, Earth Tech provides relevant excerpts and conclusions from data validation reports to the analytical laboratories. The laboratories are therefore made aware of non-critical items and areas where improvement may be made in subsequent NYSDEC ASP work.

8 DATA REDUCTION, VALIDATION, AND REPORTING

The guidance followed to perform quality data validation, and the methods and procedures outlined herein and elsewhere in the Work Plan, pertain to initiating and performing data validation, as well as reviewing data validation performed by others (if applicable). An outline of the data validation process is presented here, followed by a description of data validation review summaries.

8.1 LABORATORY DATA REPORTING AND REDUCTION

The laboratory will meet the applicable documentation, data reduction, and reporting protocols as specified in the 2000 revision of the NYSDEC ASP. Laboratory data reports for non-CLP data will conform to NYSDEC Category B deliverable requirements, as specified in Exhibit D, Part II.E, Section 3. Category B deliverables for volatile organics include:

- SDG narrative
- NYSDEC Data Summary (as defined in ASP Exhibit D, Section 2.D)
- Chain-of-custody
- Quality Control Summary, including
    - System Monitoring Compounds
    - Matrix Spike/Matrix Spike Duplicates
    - QC check/standard summary
    - Matrix spike blank

- Instrument performance check (BFB tune)
- Instrument Detection Limits
- Sample Data (Form I-VOA and Form I-VOA-TIC)
- Reconstructed Ion Chromatograms (RICs)
- Mass spectra (raw and processed; for target and non-target compounds) including library search
- Standards data (Form IV)
- Continuing Calibration (From VII)
- Raw QC data
- Matrix Spike and MS/MSD data
- Calculations
- Extraction Logs

Copies of the laboratory's generic Quality Management Plan (LQMP) (referred to as the laboratory QAP in the ASP) will be maintained at Earth Tech's New Jersey office and will be provided to NYSDEC upon request. (The LQMP would normally have been reviewed by NYSDOH as part of the ELAP certification process.) The laboratory's QMP will indicate the standard methods and practices for obtaining and assessing data, and how data are reduced from the analytical instruments to a finished report, indicating levels of review along the way.

In addition to the hard copy of the data report, the laboratory will be asked to provide the sample data in spreadsheet form on computer diskette. The diskette will be generated to the extent possible directly from the laboratory's electronic files or information management system to minimize possible transcription errors resulting from the manual transcription of data.

8.2 DATA VALIDATION

Data generated for this RI will be validated by a third-party subcontractor (not affiliated with the laboratory or with Earth Tech). Data validation will be performed by following guidelines established in the US EPA Region 2 SOP No. HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired Using SW-846 Method 8260B, Revision 2 (December, 1996). This SOP is a check list which is designed to formally and rigorously assess the quality and completeness of CLP data packages. The use of these USEPA SOPs will be adapted to conform to the specific requirements of the NYSDEC ASP (e.g., NYSDEC/ASP holding times; matrix spike blank requirements). Where necessary and appropriate, supplemental validation criteria may be derived from the EPA Functional Guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, Publication 9240.1-05, EPA-540-R-04-004, October 2004).

Validation reports will consist of text results of the review and marked up copies of Form I (results with qualifiers applied by the validator). Validation will consist of target and non-target compounds with corresponding method blank data, spike and surrogate recoveries, sample data, and a final note of validation decision or qualification, along with any pertinent footnote references. Qualifiers applied to the data will be documented in the report text. Where QC failures caused the laboratory to perform a re-analysis, the data validator will make a recommendation as to which of the two analyses should be used.

There may be some analyses for which there is no established USEPA or NYSDEC data validation protocol. In such cases, validation will be based on the Region 2 SOPs and EPA Functional Guidelines as much as possible, as well as the laboratory's adherence to the technical requirements of the method, and the professional judgment of the validator. The degree of rigor in such validation will correspond to the nature of the data and the significance of the data and its intended use.

8.3 DATA USABILITY

Subsequent to review of the items evaluated in the subcontractor data validator reports and accompanying tables, Earth Tech's QA staff then prepares a brief data usability summary. The data usability summary, which will be provided as part of the RI report, encompasses both quantitative and qualitative aspects, although the qualitative element is the most significant.

The quantitative aspect is a summary of the data quality as expressed by qualifiers applied to the data; the percent rejected, qualified (i.e., estimated), missing, and fully acceptable data are reported. As appropriate, this quantitative summary is broken down by matrix, laboratory, or analytical fraction or method.

The qualitative element of the data usability summary is the QA officer's translation and summary of the validation reports into a discussion useful to data users. The qualitative aspect will discuss the significance of the qualifications applied to the data, especially in terms of those most relevant to the intended use of the data. The usability report will also indicate whether there is a suspected bias (high or low) in qualified data, and will also provide a subjective overall assessment of the data quality. If similar analyses are performed by more than one method, a discussion of the extent of agreement among the various methods will be included, as well as discussion of any discrepancies among the data sets.

The QAO will also indicate if there is a technical basis for selecting one data type over another for multiple measurements which are not in agreement.

Non-CLP data which has not been validated and field data used for the RI will be discussed in the data usability summary.

8.4 FIELD DATA

Field chemistry data collected during air monitoring, soil screening (e.g., HNu readings), and water monitoring (i.e., pH, turbidity, specific conductance, and temperature) will be presented in tabular form with any necessary supporting text. Unless activities resulted in significant unexpected results, field data comments can be added as footnotes to the tables.

9 PERFORMANCE AND SYSTEM AUDITS

As part of the laboratory subcontractor procurement process under the Earth Tech/NYSDEC Superfund Standby Contract, the laboratory assigned to this project will been verified to be certified by the NYSDOH Environmental Laboratory Approval Program for the analytical protocols to be used. Therefore, no project-specific audit of the laboratory(s) will be performed unless warranted by a problem(s) that cannot be resolved by any other means, or at the discretion of Earth Tech and NYSDEC. Field audits are not planned.

10 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Monthly project status reporting to the NYSDEC will include aspects of quality control that were pertinent during the month's activities. Problems revealed during review of the month's activities will be documented and addressed. These reports will include a description of completed and on-going activities, and an indication how each task is progressing relative to the project schedule.

The project manager, through task managers, will be responsible for verifying that records and files related to this project are stored appropriately and are retrievable.

The laboratory will submit any memoranda or correspondence related to quality control of this project's samples as part of its deliverables package.

11 REFERENCES

New York State Department of Environmental Conservation (NYSDEC), 2000. Analytical Services Protocol (ASP) Manual. June.

NYSDEC, 2002. Technical Guidance for Site Investigation and Remediation. Draft. DER-10. Division of Environmental Remediation. December.

NYSDEC, 2006. Work Assignment D004436-04 Authorization letter and Scope of work for Photocircuits/Pall Corp OU2. August 15.

NYSOH Wadsworth Laboratory Environmental Laboratory Approval Program Certification Manual. Accessed on line at http://www.wadsworth.org/labcert/elapcert/index.html. Revised December, 2005; accessed November, 2006.

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USEPA, 1986. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. EPA SW-846. With revisions through June, 2004.

USEPA, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA.

TABLE 1

Photocircuits / Pall Corp. Site

Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Pall Corporation	MW-1P	1/21/1992	5-15	No	4	
	MW-1PI	3/10/1999	41-51	48.10	2	
	MW-1PD	3/11/1999	90-100	90.61	2	
	MW-2P	1/22/1992	4-14	No	4	
	MW-3P	1/21/1992	3-14	15.21	4	
	MW-4P	1/20/1992	13-23	23.80	4	
	MW-4PI	3/12/1999	45-55	48.35	2	
	MW-4PD	3/16/1999	91-101	101.50	2	
	MW-5P	1/20/1992	3-13	13.30	4	
	MW-5PI	3/17/1999	40-50	48.35	2	
	MW-5PD	3/17/1999	90-100 +5	98.82	2	Artesian 3/06
	MW-6P	8/14/1992	50-60	59.88	4	
	MW-6PD	3/9/1999	90-100	100.95	2	
	MW-7P	11/18/1996	3-18	17.55	4	
	MW-8PS	3/25/1999	5-15 +5	13.88	2	
	MW-8PI	3/25/1999	40-50	49.79	2	
	MW-10PS	3/19/1999	5-15 +2	15.16	2	
	MW-10PI	3/19/1999	40-50 +5	50.95	2	
	MW-10PD	3/22/1999	90-100 +5	96.59	2	Artesian 3/06
	MW-11PS	8/17/1999	5-15	11.78	2	
	MW-11PI	8/17/1999	40-50	49.95	2	
	MW-11PD	8/16/1999	85-95	96.59	2	Artesian 3/06
	MW-13-PS	9/19/1999	5-15	14.65	2	
	MW-13PI	8/19/1999	40-50	50.23	2	
	MW-13PD	8/18/1999	85-95	94.70	2	
	MW-17PS	Recent?		28.75	4	Data from Apex
	MW-17PI	Recent?		54.60	4	Data from Apex
	MW-18PS	Recent?		26.20	4	Data from Apex
	MW-18PI	Recent?		56.40	4	Data from Apex
	MW-19PS	Recent?		26.20	4	Data from Apex
	MW-19PI	Recent?		50.23	4	Data from Apex
Pall Corporation Pilot Test Wells	PT-MW-1S	Recent		14.15	4	Data from Apex
	PT-MW-1I	Recent		55.55	4	Data from Apex
	PT-MW-2S	Recent		14.39	4	Data from Apex
	PT-MW-2I	Recent		55.54	4	Data from Apex
	PT-MW-3S	Recent		12.09	4	Data from Apex
	PT-MW-3I	Recent		56.42	4	Data from Apex
	PT-MW-4S	Recent		14.39	4	Data from Apex
	PT-MW-4I	Recent		55.54	4	Data from Apex
	PT-MW-5S	Recent		14.35	4	Data from Apex
	PT-MW-5I	Recent		56.60	4	Data from Apex
	PT-MW-6S	Recent		14.32	4	Data from Apex
	PT-MW-6I	Recent		54.49	4	Data from Apex

TABLE 1

Photocircuits / Pall Corp. Site

Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
August Thomsen	MW-1A	1/23/1992	3-13	12.02	4	
	MW-2A	1/23/1992	3-13	13.05	4	
	MW-2AI	3/23/1999	40-50	49.85	2	Artesian 3/06
	MW-2AD	3/22/1999	80-90 +5	100.25	2	Artesian 3/06
	MW-12PS	8/23/1999	5-15	14.27	2	
	MW-12-PI	8/23/1999	40-50	49.65	2	
	MW-12PD	8/20/1999	85-95	100.70	2	Artesian 3/06
Photocircuits	MW-1	5/12/1987	15-25	No	2	
	MW-2	5/14/1987	10-25*	No	2	
	MW-3	5/13/1987	10-20	No	2	
	MW-4	5/14/1987	14-24	No	2	
	MW-5	5/20/1987	90-100	No	2	
	MW-6	5/13/1987	5.5-15.5	No	2	
	MW-7	8/30/1988	11-26	No	2?	
	MW-8	8/25/1988	155-170	No	2	
	MW-9	8/10/1988	10-25	No	2	
	MW-10	8/12/1988	115-130	No	2	
	MW-11	8/17/1988	160-175	No	2	
	MW-12	10/14/1999	40-50	No	4	
	MW-13	10/15/1999	40-50	No	4	
	MW-14	10/19/1999	45-45	No	4	
Pass & Seymour (Slater Elec.)	MW-1S	1/27/1992	6-21	No	4	
	MW-2S	1/27/1992	6-21	No	4	
	MW-3S	1/27/1992	5-20	No	4	
	MW-4S ***	4/22/1998	4-14	No	4	
Nassua County?	NC-WELL	NA	NA	No	NA	
Sea Cliff Avenue	MW-14PCS	UNK	UNK	23.20	4	Data from Apex
	MW-14PCI	UNK	UNK	49.95	2	Data from Apex
	MW-14PCD	1/4/2000	85-95	90.36	2	
	MW-15PCD	2/22/2000	90-100	99.00	2	
	MW-16PCI	1/6/2000	40-50	49.95	2	
	MW-16PCD	1/6/2000	85-95	96.80	2	
Associated Draperies	MW-1H	Pre-1998	7-27	No	2 or 4	
	MW-2H	Pre-1998	7-27	No	2 or 4	
	MW-1M	NA	19-34	No	2	
Carney Street Well Field	N-3466	NA	148-173	No	NA	
	N-8326 (No. 21)	NA	120-165	No	NA	
	N-8327	NA	115-165	No	NA	
	MW-1GS	NA	TD=23.75	See GC	NA	Duplicate listing?
	MW-1GI	NA	TD=113.5	See GC	NA	Duplicate listing?
	MW-1GD	NA	TD=205	See GC	NA	Duplicate listing?

TABLE 1
Photocircuits / Pall Corp. Site
Existing Monitoring and Supply Wells in Project Vicinity

Existing Monitoring Well Construction Details						
Site	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
City of Glen Cove	MW-1GS	1/17/2000	5-15	15.13	2 (A)	
	MW-1GI	1/18/2000	40-50	50.15	2 (A)	
	MW-1GD	1/18/2000	85-95	95.00	2 (A)	
	MW-2GS	9/7/1999	5-15	13.90	2 (A)	
	MW-2GI	9/7/1999	40-50	49.65	2 (A)	Artesian 3/06
	MW-2GD	9/7/1999	90-100	NR	2 (A)	Artesian 3/06
Public Supply Well Field Monitoring Wells	GC-1S	NA	19-39	No	NA	
	GC-1D	NA	175-195	No	NA	
	GC-2S	NA	19-39	40.42	NA	
	GC-2D	NA	188-208	216.70	NA	
	GC-3S	NA	4-24	23.53	NA	
	GC-3M	NA	94-114	116.15	NA	
	GC-3D	NA	180-200	203.80	NA	
	GC-4S	NA	34-54	55.45	NA	
	GC-4D	NA	200-220	225.25	NA	
	GC-5S	NA	85-105	115.70	NA	
	GC-5D	NA	234-254	265.60	NA	
	GC-6S	NA	130-150	No	NA	
	GC-6D	NA	255-275	No	NA	
	GC-7S	NA	80-100	No	NA	
	GC-8S	NA	86-106	No	NA	
	GC-8D	NA	169-189	No	NA	
	GC-9S	NA	40-60	113.34	NA	Depth anomaly
	GC-10S	NA	20-40	No	NA	
	GC-11S	NA	95-115	No	NA	
	GC-11D	NA	210-230	No	NA	
	GC-WP1	NA	5-10	No	NA	
Nassau County DPW GW Monitoring Wells	G-4 (N01152)	4/21/1965	125-130	No	4	(Screen 127-130.4)
	G-1A (N05250)	3/8/1967	96-101	No	1.25	
	G-3A (N09670)	4/4/1979	37.25-42.25	No	2	
	SC-2 (N11671)	3/19/1990	19.3-24.3	No	4	Glen Head
	SC-5 (N11675)	4/4/1990	23-28	No	4	Sea Cliff
	SC-7 (N11777)	9/25/1990	68-78	No	4	Sea Cliff

PT = Well to be sampled during pump test only.
Y (Pall) = based on Figure 3-1, this well actually on Pall Corp site
Y (P&S) = based on Figure 3-1, this well actually on Pass and Seymour site.
Y (SCA) = based on Figure 3-1, this well actually on Sea Cliff Avenue.
Y(GZA) = found on figure in GZA FRI report (1999) but not on D&B figures.
* = Well IDs MW-1GS, 1-GI, and 1-GD listed twice on table but shown only once on Figure 3-1; DB Table 4-1 lists Carney St Wells MW-GD1, GD2, GD3, and GD4.
** = Only GC-1 shown on Figure 3-2 (singlet, not GC-1S/1D doublet).
*** = MW-4S shown on figure 3-1 but not on vicinity well table; well log in McLaren-Hart RI, 9/28/98
Boring logs from Enviro-Science except CAR by C A Rich; FDG by Fluor Daniel GTI. Logs for county DPW wells requested but not yet received.
Highlighted data is anomalous (well depth from Enviro-Science sampling log does not match reported well depth).

TABLE 2

Photocircuits / Pall Corp. Site

List of Existing Monitoring Wells Included in the Sampling Program

Existing Monitoring Well Construction Details						
Site/Property	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Pall Corporation	MW-1P	1/21/1992	5-15	No	4	
	MW-1PI	3/10/1999	41-51	48.10	2	
	MW-1PD	3/11/1999	90-100	90.61	2	
	MW-4P	1/20/1992	13-23	23.80	4	
	MW-4PI	3/12/1999	45-55	48.35	2	
	MW-4PD	3/16/1999	91-101	101.50	2	
	MW-5P	1/20/1992	3-13	13.30	4	
	MW-5PI	3/17/1999	40-50	48.35	2	
	MW-5PD	3/17/1999	90-100 +5	98.82	2	Artesian 3/06
	MW-6P	8/14/1992	50-60	59.88	4	
	MW-6PD	3/9/1999	90-100	100.95	2	
	MW-10PS	3/19/1999	5-15 +2	15.16	2	
	MW-10PI	3/19/1999	40-50 +5	50.95	2	
	MW-10PD	3/22/1999	90-100 +5	96.59	2	Artesian 3/06
	MW-11PS	8/17/1999	5-15	11.78	2	
	MW-11PI	8/17/1999	40-50	49.95	2	
	MW-11PD	8/16/1999	85-95	96.59	2	Artesian 3/06
	MW-13-PS	9/19/1999	5-15	14.65	2	
	MW-13PI	8/19/1999	40-50	50.23	2	
	MW-13PD	8/18/1999	85-95	94.70	2	
August Thomsen	MW-2A	1/23/1992	3-13	13.05	4	
	MW-2AI	3/23/1999	40-50	49.85	2	Artesian 3/06
	MW-2AD	3/22/1999	80-90 +5	100.25	2	Artesian 3/06
	MW-12PS	8/23/1999	5-15	14.27	2	
	MW-12-PI	8/23/1999	40-50	49.65	2	
	MW-12PD	8/20/1999	85-95	100.70	2	Artesian 3/06
Photocircuits	MW-3	5/13/1987	10-20	No	2	
	MW-7	8/30/1988	11-26	No	2?	
	MW-8	8/25/1988	155-170	No	2	
	MW-9	8/10/1988	10-25	No	2	
	MW-10	8/12/1988	115-130	No	2	
	MW-11	8/17/1988	160-175	No	2	
	MW-12	10/14/1999	40-50	No	4	
Sea Cliff Avenue	MW-14PCD	1/4/2000	85-95	90.36	2	
	MW-15PCD	2/22/2000	90-100	99.00	2	
	MW-16PCI	1/6/2000	40-50	49.95	2	
	MW-16PCD	1/6/2000	85-95	96.80	2	
Carney Street Well Field	MW-1GS	NA	TD=23.75	TBC [2]	NA	Depth uncertain
	MW-1GI	NA	TD=113.5	TBC [2]	NA	Depth uncertain
	MW-1GD	NA	TD=205	TBC [2]	NA	Depth uncertain

TABLE 2

Photocircuits / Pall Corp. Site

List of Existing Monitoring Wells Included in the Sampling Program

Existing Monitoring Well Construction Details						
Site/Property	Well Designation	Date Installed	Screen Zone (ft bgs)	Well TD (Apex 2006)	Well Diam. (inches)	Comment
Public Supply Well Field Monitoring Wells	GC-1D	NA	175-195	No	NA	
	GC-2S	NA	19-39	40.42	NA	
	GC-2D	NA	188-208	216.70	NA	
	GC-3S	NA	4-24	23.53	NA	
	GC-3M	NA	94-114	116.15	NA	
	GC-3D	NA	180-200	203.80	NA	
	GC-4S	NA	34-54	55.45	NA	
	GC-4D	NA	200-220	225.25	NA	
	GC-5S	NA	85-105	115.70	NA	
	GC-5D	NA	234-254	265.60	NA	
	GC-10S	NA	20-40	No	NA	
	GC-11S	NA	95-115	No	NA	
	GC-11D	NA	210-230	No	NA	

Notes:

1. List of wells to be sampled will be updated and modified after completion of the well survey task.
2. To be checked during well survey; available well information is contradictory; well logs not yet acquired.

TD = Total Depth

"Well TD" column based on data reported in Apex report (May, 2006).

Table 3
Draft Quality Assurance Project Plan
Photocircuits/Pall Corp Deep Groundwater (OU2) RI/FS
Field Sample and QA/QC Sample Off-Site Laboratory Quantity Summary

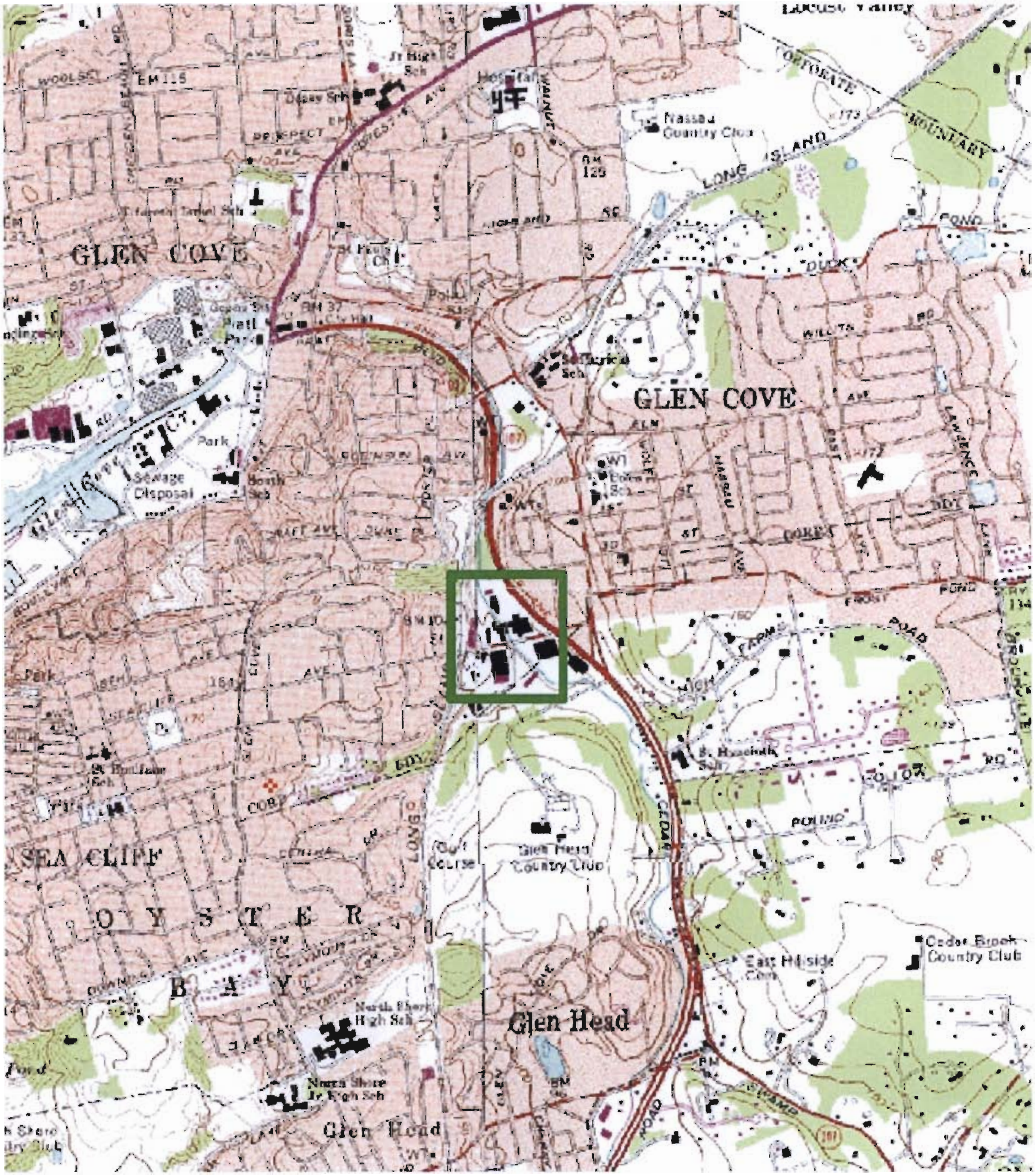
MATRIX/ANALYSIS	Analytical Method	Laboratory [1]	Reporting Limit Goal (units as specified)	Field Sample Quantity	Matrix Spike (MS)	MS Duplicate	Field Duplicate	Equipment Blank [6]	Trip Blanks
Hydropunch (Photocircuits) [2]									
Volatile Organics	SW 846 8260 B	TBD	1.0 ug/L (each) [4]	16	1/batch [5]	1/batch [5]	5%	1/wk	1/shipment
Groundwater - Round 1 [3]									
Volatile Organics	SW 846 8260 B	TBD	1.0 ug/L (each) [4]	76	1/batch [5]	1/batch [5]	5%	1/wk	1/shipment
Groundwater - Round 2 [3]									
Volatile Organics	SW 846 8260 B	TBD	1.0 ug/L (each) [4]	76	1/batch [5]	1/batch [5]	5%	1/wk	1/shipment
Pump Test GW samples [7]									
Volatile Organics	SW 846 8260 B	TBD	1.0 ug/L (each) [4]	45	1/batch [5]	1/batch [5]	5%	1/wk	1/shipment

(1) Proposed laboratory will be identified prior to submission of final QAPP.
(2) Hydropunch sample quanitity assumes two borings to 160 ft bgs each, sampled every 20 ft; no sample from shallow (0-20 ft) interval.
(3) Field sample quantity includes 53 existing wells to be sampled (FAP Table 2-2) and 23 proposed new monitoring wells (FAP Table 2-3).
(4) VOC analysis will utilize 25-mL purge to achieve nominal 1 ug/L reporting limit for chlorinated VOCs. RLs for low-response VOCs may be higher.
(5) Normal QC is one for each analytical batch of 20 field samples or fewer.
(6) Equipment (field) blanks will be taken once per week for dedicated sampling equipment; separate equipment blanks required for each sampling equipment type.
(7) Pump Test sample quantity assumes 48 hour test; sample every 12 hours (5 times); samples from Carney Well 21; Well 06MW-103 quadruplet; and MW-8P quadruplet.

Table 4
Draft Quality Assurance Project Plan
Photocircuits/Pall Corp Deep Groundwater (OU2) RI/FS
Sample Bottle, Volume, Preservation, and Holding Time Summary

MATRIX/ANALYSIS	Sample Prep Method [1]	Analytical Method [2]	Sample Bottles (3)				Minimum	Preservation	Holding Time (5)		Comment
			Mat'l	Size	Qty	Source	Vol Rqd	(4)	Extraction	Analysis	
Aqueous [5]											
Volatile Organic Compounds	SW-846 5030B	SW 846 8260B	G	40 mL	2 or 3	TBD	40 mL	HCl to pH <2	NA	7 days	

(1) Laboratory may propose alternate preparation method, subject to Earth Tech and NYSDEC approval
(2) 25 mL purge option required to meet project sensitivity objectives.
(3) Bottles to be provided by laboratory; number of VOC vials submitted is at laboratory discretion.
(4) samples bottles will be submitted pre-preserved by laboratory; pH adjusted in field if necessary.
(5) Holding time for calculated from day of collection.
G = Glass
SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. USEPA SW-846. Complete through Update IIIB, November 2004.
Bottle Sources:
TBD: Bottles provide by laboratory (to be determined)



LEGEND

SITE LOCATION

0.2 0 0.2 0.4

GRAPHIC SCALE

SYMBOL	DESCRIPTION	DATE	APPROVED
	REVISIONS		

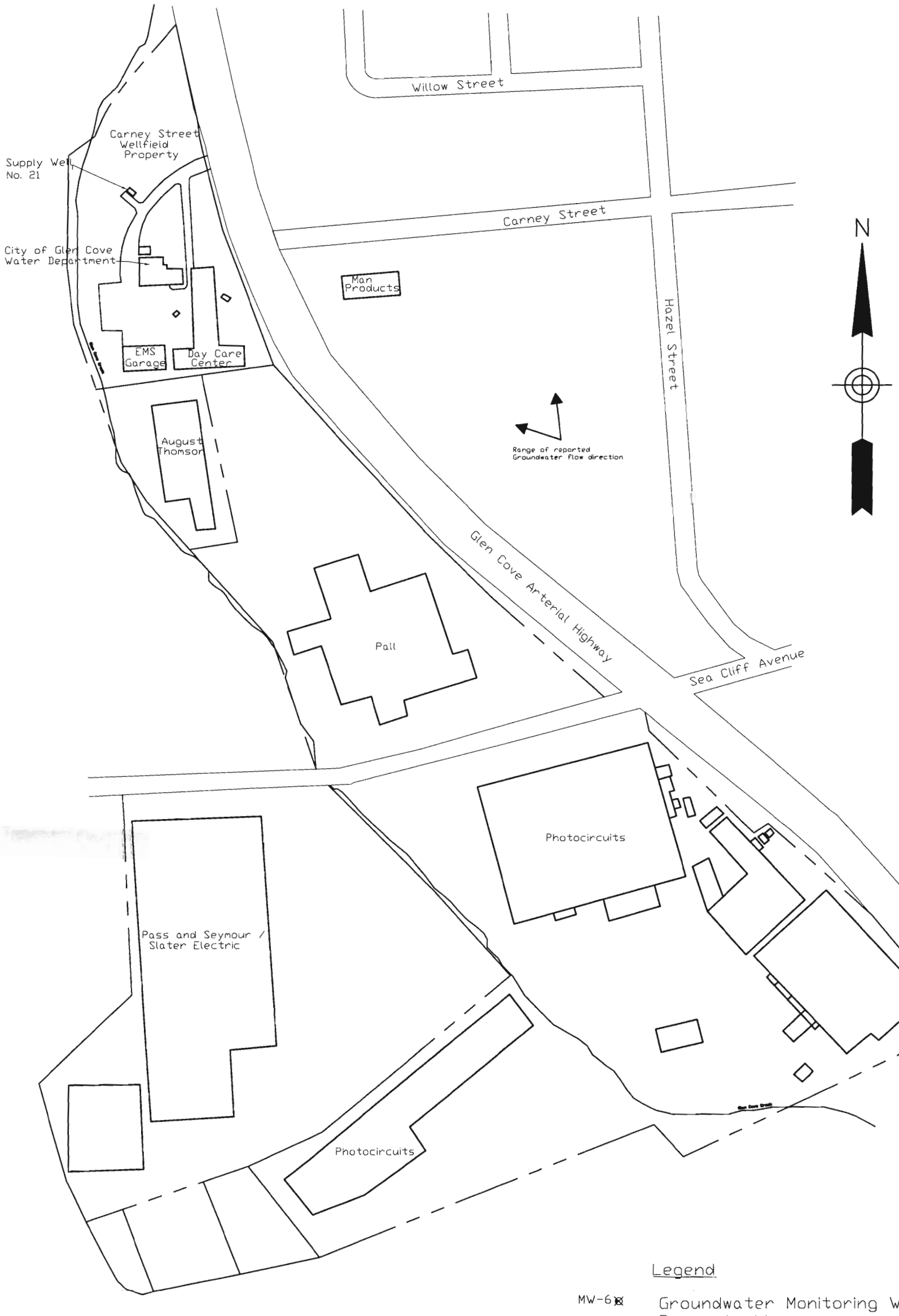
Prepared by: EarthTech

Prepared for: New York State Department of Environmental Conservation

Photocircuits / Pall Corp.
GLEN COVE, N.Y.

SITE LOCATION PLAN

DESIGNED BY:	RS
DRAWN BY:	RS
CHECKED BY:	AB
SUBMITTED BY:	AB
DATE:	SEPTEMBER 2006
SCALE:	AS SHOWN
DRAWING NO.:	FIGURE 1



300 BROADACRES DRIVE
BLOOMFIELD, NJ 07003

ENVIRONMENTAL / CONSULTING ENGINEERS

DRAWING TITLE: ***SITE PLAN***

DRAWN BY: MC
CHECKED BY: KS
SCALE: As Shown
DATE: 11/20/06
PROJECT NO. 95636
DRAWING NO. ***FIGURE 2***

PROJECT:
Photocircuits and Pall Corp.
Glen Cove, New York

CLIENT:
NYSDEC
Albany, NY

REVISIONS

NO.	DATE	DESCRIPTION

EARTH TECH

FIGURE 3
PROJECT ORGANIZATION CHART
PHOTOCIRCUITS / PALL CORP OU2 (DEEP GROUNDWATER) RI/FS
WORK ASSIGNMENT No. D004436-04