REPORT

RCRA Facility Investigation
Former Phillips Display Components Facility
Seneca Falls, New York
for
GTE Operations Support Incorporated
Volume I

URS Job No.: 27010-040-007
June 28, 2002

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EXECUTIVE SUMMARY

This RFI Report for the former Philips Display Components Facility in Seneca Falls, New York, was prepared by URS Corporation for GTE Operations Support Incorporated. The original RFI work plan was prepared by SECOR International in 1996. Three work plan addenda expanded the scope of the investigation, and were prepared and carried out by O'Brien & Gere Engineers, Inc. (O'Brien & Gere). Prior to the implementation of these work plans, various SWMUs and areas of concern had been investigated and closed by others between 1980 and 1995.

The purpose of the RFI is to identify releases from those SWMUs or areas of concern that may warrant corrective action, and use existing data to remove other areas from further consideration. This process focuses resources on those units or areas that pose unacceptable risks. Further investigation of Site hydrology and hydrogeology will be performed to develop strategies to mitigate the risks posed.

The original RFI objective was to characterize the nature and extent of residuals in environmental media. The objective was modified to include assessing the vertical extent of groundwater residuals transport and potential preferential migration pathways. As the investigation proceeded, these objectives were further refined to evaluate potential impacts at the soil-bedrock interface and in the bedrock aquifer. Work Plan Addenda described the installation of three bedrock interface monitoring wells and six bedrock monitoring wells, as well as the collection of a sample from the interceptor sewer effluent, a survey of the building sumps and pits, and an evaluation of indoor air quality. Changes to the work plans were made in consultation with NYSDEC. Indoor air evaluation procedures will be addressed in the near future. The main objective of this RFI report is to identify potential sources of Site-related residuals that may pose unacceptable risks.

The Site includes 85 acres in the Village of Seneca Falls, New York, with 13 acres of buildings and the remainder covered by asphalt parking lots, grassy areas, or woods. The Site is bordered by Van Cleef Lake and the Seneca River/Barge Canal to the south, undeveloped and agricultural areas to the north and east, and residential areas to the north and west, including the Prospect Hill Apartments, which were constructed and occupied in 2001. The apartment property was previously part of the Site and was used as a parking lot. The original Site buildings were constructed to manufacture pumps in 1914. In the 1940s, the plant expanded and began to manufacture black and white television tubes. During the 1960s, the plant began to manufacture color television tubes. The operation ceased and the facility was subsequently sold to the Seneca County Industrial Development Agency. In 1989, H.P. Neun Company, Inc. began leasing the Site and currently subleases building space to industrial/commercial tenants including offices, light manufacturing, and warehousing. The current land use is not expected to change in the foreseeable future.

Topography across the Site is generally flat although a 35-foot escarpment borders the southern boundary of the property adjacent to the river/canal. The property is underlain by fill material and 20-45 feet of glaciolacustrine silt and clay with varying amounts of sand to boulder-size material overlying bedrock. The limestone bedrock consists of an upper weathered zone, a thick and massive zone, and a deeper zone that is fractured and artesian. The glaciolacustrine and bedrock units are likely not in direct hydraulic connection beneath the facility. Groundwater flow in the glaciolacustrine unit was estimated by O'Brien & Gere to be to the south/southeast at a rate of 1.5 to 2.5 ft/yr. Groundwater flow in the bedrock has yet to be adequately determined but appears to be to the south. Groundwater flow within the bedrock occurs principally through secondary porosity features such as fractures, joints, and bedding planes although vertical fractures were not evident in the two rock cores. Groundwater elevations in two of the bedrock wells at the base of the escarpment appear to be influenced by the surface water elevations in the adjacent lake and river/canal. The lake upstream of the dam appears to be locally recharging the bedrock groundwater, but groundwater in the upper weathered zone of bedrock normally discharges to the river/canal, which is at a much lower elevation than the lake. One bedrock well along the river is artesian. The screen for this well was set beneath the massive portion of the bedrock unit, into the deeper portion where fractures are present.

RCRA Corrective Action activities began with the RFA and a series of sampling visits in the early 1990s at five on-Site units that were eventually closed (Interim Drum Storage Area, Satellite Storage Area, former Underground Fuel Oil Tank, PCB Capacitor Storage Area, and a former open burning area). In addition, selected sumps, pits and floor drains were investigated but areas beneath floor slabs were not investigated, since the former plant buildings were declared to be an inaccessible SWMU. Removal and RCRA closure of the former wastewater sludge holding and effluent lagoons, the former incinerator and underground waste feed tanks, and former container storage areas were also completed. In addition, 11 methanol or fuel products USTs and associated soils impacted by releases have been closed. Installation of new sewer lines required the segregation and ultimate disposal of 2,300 tons of soils impacted with Site related constituents. Finally, numerous process tanks and units have been decontaminated and/or dismantled and disposed, thereby removing potential future sources of releases.

Groundwater samples have been collected regularly since 1993 to assess groundwater quality changes with time. Elevated levels of chlorinated solvents (TCE and daughter products) have been identified in three primary areas on the south side of the buildings. The data indicate that total chlorinated VOC concentrations decreased between 1993 and present. The distribution of these constituents indicates that Building 2 and Building 11 represent likely source areas. The Building 7 area, which lies between those two potential source areas, may represent the fringe area of one or both of the potential source areas, or may represent an unrelated diffuse area of impact. The presence of daughter products demonstrates that TCE is degrading in the environment and in some areas only daughter products remain. Historic drum failures of mixed chlorinated solvents are documented in or near each of these likely source areas. In addition, during the rerouting of the sewer lines, certain sections of the trenches were excavated and disposed because they had been impacted. These areas are also adjacent to or near Buildings 2, 7, and 11. A pit near Building 2 has been identified where TCE was managed historically.

DNAPL was visually identified by O'Brien & Gere (primarily TCE) as a heavy residual in the soil at 25-28 feet while installing a monitoring well outside of Building 2. However, this well is screened into the top of competent bedrock at 35 feet, and has remained dry since it was installed. Therefore, the potential for vertical migration to bedrock groundwater is low. DNAPL has not been visually identified elsewhere on the Site; however, the potential presence of DNAPL may be inferred from groundwater concentrations near Building 11. Free-phase

DNAPL has not been observed in groundwater in any of the monitoring wells at the Site. Other than TCE and daughter products, residuals that exceeded applicable guidance, standards, and/or background concentrations with a degree and frequency that warrants further evaluation include BTEX, acetone, cadmium, and zinc.

Many areas require no further action because the applicable guidance, standards, and/or background concentrations have not been exceeded, or the area is being addressed as part of another unit, including:

- **Building 9A** (See Section 2.6);
- **Building 13 Truck Dock Area** (See Section 2.12);
- **Historic Outfalls – Interceptor Trench Outfall only** (See Section 2.13);
- **Grassy Areas Near Buildings** (See Section 2.14);
- **Interceptor Sewer Areas - soil** (See Section 2.16);
- **Overburden Temporary Well Pairs** (See Section 2.17);
- **Bedrock Interface Wells** (See Section 2.18); and
- **Bedrock Monitoring Wells** (See Section 2.19).

Many other areas require no further action since the detected concentrations were of low frequency or marginally exceeded screening values, and are below values for unrestricted residential use, including:

- **Courtyard Area** (See Section 2.2);
- **Building 2A** (See Section 2.3);
- **Building 3 Sump** (See Section 2.4);
- **Six-inch Effluent Line Area** (See Section 2.8);
- **Building 9** (See Section 2.9);
- **MW-20 Area** (See Section 2.10);
- **Building 13 Fuel Oil Tank Area** (See Section 2.11);
- **Historic Outfall HO-3 only** (See Section 2.13); and
- **Fields East of the Buildings** (See Section 2.15).

The results of the RFI indicate that some investigative areas contain Site-related constituents at concentrations and frequencies that warrant further consideration, including:

- **Building 2** (See Section 2.3);
- **Building 7** (See Section 2.5);
- **Building 11** (See Section 2.7);
- **Historic Outfalls HO-1, 2, 4, 5, and 6/7** (See Section 2.13);
- **Interceptor Sewer Effluent** (See Section 2.20); and
- **Remaining Sumps and Pits** (See Section 2.21).

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT: FORMER PHILIPS DISPLAY COMPONENTS FACILITY GTE OPERATIONS SUPPORT INCORPORATED SENECA FALLS, NEW YORK

1.0 INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the former Philips Display Components Facility in Seneca Falls, New York (the "Site"), was prepared by URS Corporation (URS) on behalf of GTE Operations Support Incorporated (GTEOSI). The original work plan was prepared by SECOR International (SECOR) in 1996. The work plan addenda and field work were prepared and conducted by O'Brien & Gere. A description of the original work plan and the three work plan addenda is included in Attachment 1. Prior to the implementation of this work plan and addenda, various Solid Waste Management Units (SWMUs) and other areas had been investigated by others under the RCRA Corrective Action Program.

The original SECOR Work Plan, approved by New York State Department of Environmental Conservation (NYSDEC), was designed to investigate ten areas of the Site based on their past use. Prior to the implementation of the SECOR Work Plan, O'Brien & Gere prepared a work plan addendum expanding the scope of the investigation. NYSDEC approved the work plan addendum in October 2000. Following completion of the amended scope of work, O'Brien & Gere prepared work plan Addendum No. 2, which was developed and issued in collaboration with NYSDEC in January 2001. Finally, Addendum No. 3 was prepared to address various issues raised by NYSDEC at a meeting between NYSDEC, GTEOSI, and O'Brien & Gere, and was approved in May 2001. To date, the expanded scope of work has resulted in the investigation of 21 areas.

Although the installation of bedrock interface (BI) monitoring wells (MWs) was conceptually included in Addendum No. 1, Addendum No. 2 was issued to provide specific locations and to describe the Sonic® drilling method. Addendum 3 was based primarily on the finding that trichloroethene (TCE) and its breakdown products were present in subsurface soil above New York State (NYS) Technical and Administrative Guidance Manual #4046 guidance levels (TAGMs). Addendum 3 was designed to further evaluate whether identified compounds migrated to down gradient areas or environmental media and included the installation of six bedrock groundwater monitoring wells (MW-BR-01 through MW-BR-06). Addendum 3 also included the collection of a sample from the interceptor sewer effluent, a survey of the building sumps and pits, and an evaluation of indoor air quality. The indoor air evaluation procedures have not been finalized, but indoor air issues will be addressed in the near future.

1.1 INVESTIGATION OBJECTIVES

The original RFI objectives were directed at characterizing the nature and extent of residuals in environmental media at select areas throughout the facility, and obtaining the data necessary to support a Corrective Measures Study, if necessary (SECOR 1996). The investigation objectives were modified to include assessing the vertical extent of groundwater residuals transport and potential preferential migration pathways. As the investigation proceeded and preliminary data was obtained, these modified objectives were further refined to include an evaluation of potential impacts at the soil-bedrock interface and in the bedrock aquifer. The underlying main objective of this investigation is to identify potential sources of Site-related residuals that might pose unacceptable risks.

1.2 REPORT ORGANIZATION

Section 1 of the report briefly describes the Site and environmental setting and Site background, although more detailed descriptions of the Site and regional setting, geology and hydrogeology, and Site history are included in the attachments, as well as maps and drawings depicting noteworthy features. Attachments 2 and 3 include the report references and an acronym list. Other attachments and appendices include a description of the methods used to collect Site data and present the collected data in tabular format. Appendices are also included for boring and well sampling logs, air monitoring logs, data validation reports and photographs. Section 2 of this report describes the data collected from each area and compares the data to screening criteria to evaluate potential sources of Site-related residuals. Section 3 summarizes the constituents and media across the Site as a whole, describes the likely source areas, and explains the approach used to further screen the data. Finally, Section 4 concludes with a description and justification for those areas that require no further action and those that do.

1.3 SITE DESCRIPTION

The Seneca Falls facility encompasses approximately 85 acres east of and adjacent to the Village of Seneca Falls in Seneca County, New York (Figure 1). The property includes a series of interconnected buildings covering approximately 13 acres (Figure 2). The remainder of the Site is covered by asphalt parking lots, grass, or woods. The property is bordered by Van Cleef Lake and the Seneca River/Barge Canal to the south, undeveloped and agricultural areas to the north and east, and a residential area to the west. During its operation, numerous SWMUs have been identified and investigated at locations across the site (Figure 3).

1.4 ENVIRONMENTAL SETTING

A general description of the key factors affecting Site and regional setting are included in this section. A detailed Site and regional setting description is included in Attachment 4.

The climate of Seneca County is classified as humid continental. A water surplus from December through April promotes groundwater recharge. However, late spring and summer months create water deficit conditions that normally prevent significant recharge. Water budget conditions change as climatic conditions fluctuate.

The Former Philips Display Components Site is in the northern portion of Seneca County, near the northwestern end of Cayuga Lake. The Central Lowland province makes up approximately the northern third of the County. Between the New York State Thruway and the northern ends of Seneca and Cayuga Lakes, the topography is nearly flat, with very little relief (Mozola 1951). The Site lies within the glacial lake plain of the Central Lowland province.

Topography across the Site is generally flat with the ground elevation decreasing towards the river/barge canal. A 35-foot escarpment borders the southern boundary of the property. The property is underlain by fill material of varying thickness, and approximately 20 to 45 feet of glaciolacustrine deposits consisting of silt and clay with varying amounts of fine to medium-grained sand to boulder-size material overlying bedrock. Thin sandy lenses were also observed within the glaciolacustrine deposits in several of the on-Site borings. These sand lenses are not of sufficient thickness or areal extent to be correlated across the Site. However, localized transport of groundwater residuals likely occurs within these thin sand lenses.

The glaciolacustrine materials are underlain by fractured limestone known as the Bertie Limestone. The Bertie Limestone is reported to be approximately 30 feet thick in Seneca County; however, at least 120 feet of limestone was penetrated at monitoring well MW-BR-01. The Camillus Shale underlies the Bertie Limestone and consists of calcareous shale layers with occasional thin dolomite limestone beds (Mozola 1951).

The bedrock within the county generally strikes east-west with a gentle regional southward dip (Crain 1974). Based on the elevations from bedrock wells, the top of bedrock slopes to the northeast and south beneath the Site. A bedrock elevation contour map of the northern portion of Seneca County is shown on Figure 4. As shown on this figure, a relatively narrow bedrock trough is present near Seneca Falls. This trough lies to the north of and does not directly coincide with the Cayuga-Seneca Canal, and may therefore represent a paleochannel. Bedrock cores were collected on top of the escarpment north of the facility (MW-BR-02) and below the escarpment adjacent to the Cayuga-Seneca Canal (MW-BR-05). The core logs for these wells are contained in Appendix A. These core logs and those from other historic bedrock wells have been used to construct geologic cross section maps (Figure 5). The character of the bedrock encountered in the core holes can be described as slightly fractured to sound. The bedrock consists of an upper highly weathered zone, a massive dry zone, and a deeper fractured zone. Monitoring well MW-BR-04 is screened in this deeper fractured zone and is artesian.

The environmental setting and land use vary across the Site. The predominant current and anticipated future land use for the Site is industrial/commercial. There are four environmental settings/land uses on and adjacent to the Site. These settings include the industrial, undeveloped and agricultural, waterways, and residential. The Site is comprised of interconnected industrial buildings covering approximately 13 acres and associated infrastructure. The Site is bordered by undeveloped and agricultural areas to the north and east. The property is bordered by Van Cleef Lake and the Seneca River/Barge canal to the south. The Seneca Falls facility is bordered to the west by a residential apartment building, the Van Cleef Lake Apartments, which were constructed and occupied in 2001. This land was previously owned by the Former Philips Display Components and was used as a parking lot.

1.5 SITE HYDROGEOLOGY

A more detailed discussion of Site hydrogeology is contained in Attachment 4. The overburden and bedrock units are likely not in direct hydraulic connection. Groundwater flow in the overburden unit is predominantly to the southeast. Based on monitoring data and questionable well construction techniques, groundwater flow in the bedrock has yet to be adequately determined. Figure 6 depicts the potentiometric surface in the overburden unit. O'Brien & Gere concluded that the rate of groundwater flow within the overburden unit varies seasonally from approximately 0.007 ft/day (2.5 ft/year) to 0.004 ft/day (1.5 ft/year), to the south and southeast.

Groundwater flow within the bedrock hydrogeologic unit underlying the Site occurs principally through secondary porosity features such as fractures, joints, and bedding planes. Regional information indicates that two distinct sets of joints occur in Seneca County (Mozola 1951). Vertical fractures were not evident from the rock cores at wells MW-BR-02 and MW-BR-05.

Review of the static bedrock groundwater elevations shown on Figure 7 indicate that the bedrock wells at the base of the escarpment adjacent to Van Cleef Lake and the Cayuga-Seneca Canal (MW-BR-05 and MW-BR-06) are influenced locally by those surface water bodies. Van Cleef Lake is locally recharging the bedrock groundwater near MW-BR-06. In addition, the groundwater elevation at MW-BR-01, which is approximately 250 feet north of Van Cleef Lake, is similar to the lake elevation.

The groundwater elevation recorded at MW-BR-05 indicates that bedrock groundwater is locally discharging near the Cayuga-Seneca Canal. Bedrock groundwater near MW-BR-05 appears to be in good hydraulic connection with the Cayuga-Seneca Canal. Water levels in this well were noted to rise rapidly when the lock gate was opened to release water to the Canal and quickly decline upon gate closure. At certain times of the year the Cayuga-Seneca Canal appears to recharge the bedrock groundwater. At other times, the bedrock groundwater likely discharges to the Cayuga-Seneca Canal. This is particularly likely when the surface water elevation of the river is lowered during winter months. In addition, groundwater elevations at MW-8 to MW-BR-05 and the surface water elevation of the Cayuga-Seneca Canal indicate that bedrock groundwater flows to the south toward the Cayuga-Seneca Canal.

1.6 SITE HISTORY AND REGULATORY BACKGROUND

A general description of the key factors affecting Site history and regulatory background are included in this section. A detailed Site history and chain-of-title report is included in Attachment 5.

The five original Site buildings were constructed by Rumsey Pump in 1914. In the 1940s, Sylvania purchased the plant, expanded the facilities, and began the manufacture of black and white television tubes. During the 1960s, Sylvania began to manufacture color television tubes and eventually became GTE. Philips Display Components acquired the property in the early 1980s and continued production until the mid-1980s. The facility was subsequently sold to the Seneca County Industrial Development Agency (SECOR 1996). In 1989, H.P. Neun Company, Inc. began leasing the Site and currently subleases building space to several tenants. The facility is currently used for commercial and industrial purposes including offices, light manufacturing, and warehousing.

Between 1948 and 1972, the facility discharged process waters to Van Cleef Lake and the Seneca River/Barge Canal through several outfalls along the escarpment south of the facility. In 1971 and 1972, Sylvania segregated the sewer lines handling non-process wastewater (storm and floor drains) from those handling process wastewater requiring treatment. In conjunction with these changes, an industrial wastewater treatment plant (IWWTP) was constructed and a sewer line was installed on the south side of the facility to divert the wastewater to the IWWTP. Plant wastewater was subsequently conveyed to a settling lagoon prior to discharge to the Seneca River/Barge Canal under a NYS Pollution Discharge Elimination System (SPDES) Permit (Chester 1995a). By 1992, the lagoons and IWWTP were decommissioned (Keystone 1992b). The SPDES permit was canceled in February 1990. Currently the sewer system conveys storm water runoff from roof drains and exterior catch basins and discharges the storm water to the Seneca River/Barge Canal.

Prior to this RFI, several soil and groundwater investigations were conducted between the early 1980s and 1996. A RCRA Part B application was also submitted by Philips in 1984. The application was not formally processed by NYSDEC because Phillips withdrew the application during the Interim Status period, before a draft RCRA permit was issued by the State. The application was withdrawn in 1986 when Phillips chose to close the Interim Status hazardous waste management units (lagoons, incinerator, incinerator feed tanks, and container storage areas). The decision to withdraw the permit triggered RCRA Closure of the listed units, Post-Closure monitoring on the surface impoundments, and Corrective Action at SWMUs. A RCRA Post-Closure permit was never issued, and after three years of groundwater monitoring at the former impoundments, post-closure activities were discontinued. The hazardous waste management units were closed according to the *Report on Soil Sampling for Closure Documentation – Hazardous Waste Management Units* (Chester 1989). The RFI work plan (SECOR 1996), which was submitted to NYSDEC also states: "All regulated units at the facility have been closed in accordance with the Facility Closure Plan. Closure has been approved by the New York State Department of Environmental Conservation (NYSDEC)."

The Corrective Action activities began with the RCRA Facility Assessment (RFA) and a series of sampling visits in the early 1990s, and continuing into an RFI, reported herein. According to the RCRA Facility Assessment Sampling Visit Investigation Report (Chester 1994b), five on-Site units were originally investigated. The units investigated were the Interim Drum Storage Area, the Satellite Storage Area, the former Underground fuel oil tank, the polychlorinated biphenyl (PCB) Capacitor Storage Area, and a former open burning area. In addition, selected sumps, pits and floor drains were investigated. Investigations of areas beneath floor slabs were not performed, since the former plant buildings were declared to be an inaccessible SWMU (Chester 1994b). The current RFI investigation continues and expands on the investigation of these units.

1.7 RESULTS OF PREVIOUS INVESTIGATIONS

Investigations and remedial activities were conducted over the last 20 years to identify and address areas of environmental concern. The investigations were performed in conjunction with the operation and subsequent RCRA closure of the surface impoundments. The impoundment (Waste Water Effluent Settling Lagoon), which discharged to SPDES Outfall 001 in the Seneca River, was closed in conformance with RCRA regulations in 1987 (Chester 1994b). In addition to the closure of the impoundments and other regulated units under RCRA, 11 underground storage tanks (USTs) previously used to store methanol or fuel products have been closed (Keystone 1992, Chester 1994b). In 1993 and 1994, Chester Environmental collected samples of shallow soils/sediments adjacent to seven historic outfalls. Samples were analyzed for volatile organic compounds (VOCs), cadmium, chromium, lead, zinc, fluoride and pH. VOCs were not detected, although several inorganic compounds were detected at levels above the NYSDEC TAGMs.

To supplement the historic data collected during earlier Site investigations, a groundwater monitoring program was implemented. The groundwater monitoring was performed as a separate task from the work delineated in the RFI Work Plan. Groundwater samples have been collected regularly from on-Site monitoring wells since 1993. These sample data were used to assess whether groundwater quality has changed with time (O'Brien & Gere 1999). A summary of the groundwater data from 1993 through March 2002 is provided and compared to NYSDEC (Class GA) groundwater standards on Figure 8. As shown on this figure, the results of the groundwater monitoring activities indicate the presence of certain VOCs in several areas. Constituents in these areas can be generally divided into petroleum-related compounds and chlorinated solvent compounds.

The first group, petroleum-related compounds, specifically benzene, toluene, ethyl benzene, and xylene (BTEX), are present at relatively low levels and low frequency in the groundwater near several former USTs. These levels are localized due to the low permeability soils. Concentrations of petroleum-related compounds in groundwater appear to be decreasing. The decreasing levels are likely the result of attenuation via natural degradation processes.

The second group includes areas in which elevated levels of chlorinated solvents such as TCE and its daughter product cis-1,2-dichloroethene (cis-1,2-DCE), have been identified. In three areas represented by monitoring wells MW-23, MW-24, and MW-25, total concentrations in groundwater exceed 1.0 mg/l. The data indicate that total chlorinated VOC concentrations decreased between 1993 and present.

Figure 8 illustrates that the chlorinated VOCs are present primarily in the monitoring wells on the south side of the building. The wells are near both the building and industrial drain lines. The sewer interceptor line on the south side of the building, which runs nearly perpendicular to the predominant groundwater flow direction, was believed to intercept shallow groundwater. In this area, groundwater flow is toward Van Cleef Lake and the Seneca River/Barge Canal. The invert of the interceptor line is 10 to 15 feet below ground surface (bgs) with the deepest point at the eastern end of the facility. Prior to the RFI conducted in 2000 and 2001 by O'Brien & Gere, the trench backfill material was believed to be comprised of a permeable sewer bedding that could act as a preferential pathway for migration of subsurface residuals and redirect a portion of groundwater flow along the trench backfill to the eastern side of the Site. However, the RFI investigation indicated that sewer backfill material appears to be native soil indistinguishable from surrounding soils.

1.8 PREVIOUS REMEDIAL WORK

Various remedial efforts have been implemented at the Site since 1986, when Philips decided to withdraw the RCRA permit application, triggering RCRA closure and corrective action. These efforts were often expansive in scope and took considerable resources and time to complete. A brief summary of remedial efforts at the Site include:

- Removal and RCRA closure of the former wastewater sludge holding and wastewater effluent lagoon, the former incinerator and underground waste feed tanks, and former container storage areas;
- Removal or in-place closure of numerous fuel and product underground storage tanks and associated soils impacted by releases; and
- Installation of new sewer lines that involved the segregation and ultimate disposal of 2,300 tons of soils impacted with Site related constituents.

In addition, numerous process tanks and units have been decontaminated and/or dismantled with the generated wastes disposed of properly, thereby removing potential future sources of releases to the environment.

2.0 RFI SAMPLING AND DATA

The rationale for an environmental investigation and the sampling approach for each investigative area are provided in the RFI work plan and related documents cited in Section 1 and Attachment 1. This section of the RFI report summarizes the approach and results of the RFI by investigative area. Figures 9 and 10 respectively, summarize the soil and groundwater results. Boring logs, well sampling logs, and air monitoring logs generated by O'Brien & Gere during the RFI are included in Appendix A, B, and C, respectively. Summary tables of results for the investigations of soil, sediment, and groundwater are presented in Appendix D and E, and data validation reports are in Appendix F. A photolog showing field activities is presented in Appendix G. The RFI data were evaluated by comparing them to the published values listed below.

- For soil comparison values, NYSDEC TAGMs were used (United States Environmental Protection Agency [USEPA] Region 9 preliminary remediation goals [PRGs] for residential use were used if no TAGM value was available, and Site-specific background values were also used for inorganic compounds);
- For groundwater comparison values, NYSDEC Technical and Operational Guidance (TOGs) values for Class GA groundwater were used (USEPA Region 9 PRGs for tap water were used if no TOG value was available).

Since samples collected from temporary groundwater wells were very turbid, inorganic analysis included field-filtered and unfiltered samples. The results of filtered groundwater samples were compared to published criteria. The detected constituents that exceeded published comparison values are considered potential Site-related constituents. The results of TAGMs and background comparisons of Site soil data are presented in Appendix E, Tables E-1, E-2, and E-3; while results of groundwater data comparisons to Class GA values are presented in Tables E-4 and E-5. Figures 9 and 10 present summaries of Site data and the results of screening comparisons.

2.1 BACKGROUND EVALUATION

Chester Environmental (Chester) collected background soil samples in the former agricultural area northeast of the Site (Chester 1994b). Fourteen samples were collected from two soil borings that were advanced to 16 feet bgs. The samples were submitted for laboratory analysis for total metals fluoride, cadmium, chromium, lead, and zinc.

To investigate Site-specific background concentrations of metals in sediment and soil, samples were collected by O'Brien & Gere adjacent to the shore near Trinity Church, located upstream of the Site. These samples were submitted for laboratory analysis of VOCs, target analyte list (TAL) metals, and fluoride. The two background samples did not have concentrations of VOCs above TAGMs (Table E-1). The only VOC detected in the background samples was methylene chloride, a common laboratory artifact. It was detected in both samples at concentrations well below TAGMs. The background samples were compared for consistency with published values for background concentrations of inorganics listed in TAGMs.

Inorganic data is handled differently than organic compound data in the TAGM guidance. Most of the inorganic metals have the Site-specific background data specified as the recommended soil cleanup objective. Some metals also have a recommended value as an option, if Site-specific data are not available. Finally, most of the metals have a State or regional background value specified, if there is no recommended value or Site-specific background available. As discussed above, Region 9 PRGs for residential use (a very conservative criteria) were used as substitutes in those cases where no other recommended or State or Regional background criteria were available (antimony, silver, thallium, and fluoride).

In 2001, O'Brien & Gere collected two background soil/sediment samples for 24 inorganic analytes. In 1994, Chester collected 14 surface/subsurface soil samples for five common inorganic metals (Cd, Cr, Pb, Zn, and F). Overall, the concentrations of fluoride detected in the O'Brien & Gere background samples were consistent with the levels detected by Chester (1994b). Cadmium and chromium were detected in the O'Brien & Gere background samples at concentrations lower than those measured in 1994, while lead and zinc were measured at higher concentrations in the Fall 2000 sampling event than in 1994. The following table compares the Chester and O'Brien & Gere background data.

BACKGROUND DATA COMPARISON TABLE

Metal	Chester # of detects	Chester Range (mg/kg)	Chester Average (mg/kg)	O'Brien & Gere Average (mg/kg)
Cadmium	2 out of 14	1.3 and 1.7	1.5	0.20
Chromium	14 out of 14	12.3 to 26.4	16.0	10.0
Lead:	14 out of 14	10.8 to 30.3	15.9	37.3
Zinc:	14 out of 14	33.1 to 49.3	41.0	111.5
Fluoride:	14 out of 14	1.0 to 1.8	1.6	1.3

The State and regional values specified in TAGMs are considered representative background values, and the Chester and O'Brien & Gere values are Site-specific background values. Inorganic results from the Site were compared to these two background data sets. The O'Brien & Gere background samples contained concentrations of beryllium, iron, and zinc above the optional recommended levels in TAGMs. In each case, TAGMs allows the Site-specific value to also be used as the background value, so these values are not considered to be exceedences. Inorganic constituents were retained for further consideration if the concentration in the sample exceeded both Site-specific and State or regional background data or PRGs.

2.2 COURTYARD

On April 30, 1999, an area of distressed vegetation was observed in the Courtyard during a Site walkover. To identify the nature and potential source of the distressed vegetation and to evaluate the presence of chlorinated VOCs in the subsurface soils noted during the installation of a new sewer line, surface soil, subsurface soil, and groundwater samples were collected from the Courtyard. One surface soil sample, four subsurface soil samples, and two groundwater samples were collected and analyzed to characterize the Courtyard Area. Subsurface soil samples were analyzed for VOCs, semi-volatile organic compounds (SVOCs), and inorganics; groundwater samples were analyzed for VOCs; and surface soil samples were analyzed for VOCs and inorganics.

Surface Soil

VOCs were not detected in the surface soil sample above TAGMs (Table E-1). Iron, nickel, and potassium were detected above the Site-specific value but below the regional background value. The following inorganic constituents were detected in surface soil above their respective Site-specific and regional background concentrations: cadmium, copper, mercury, and zinc (Table E-3). However, the mercury value was only barely exceeded (0.22 versus 0.2 mg/kg).

Subsurface Soil

VOCs and SVOCs were not detected in subsurface soils above TAGMs (Table E-1 and E-2). Aluminum, beryllium, chromium, copper, manganese, and potassium were detected above the Site-specific but below the regional background value. Only nickel was detected in a subsurface soil sample in the Courtyard above its respective Site-specific and regional background values, although it barely exceeded the regional value (25.4 versus 25 mg/kg) in only one sample.

Groundwater

The concentrations of TCE detected in both groundwater samples exceeded the Class GA values. Total xylenes in groundwater were also detected at levels just above Class GA values in one sample (Table E-4).

Screening Summary

The only potentially Site-related soil constituents that exceeded both sets of background values are cadmium, copper, and zinc in the one surface soil sample. It appears that TCE and xylenes detected in groundwater must originate from an area other than the Courtyard, since no VOCs were detected in soil samples above TAGMs.

2.3 BUILDING 2 AND 2A AREA

Trenching activities conducted south of Buildings 2 and 2A indicated the presence of stained soils and a previously unknown UST. The UST and surrounding impacted soils were removed in January 1994. Soil samples collected during these excavation activities indicated the presence of several VOCs including cis-1,2-DCE, TCE, 1,3-dichlorobenzene (1,3-DCB), 1,4-DCB, and xylenes. Soil boring samples collected near Building 2 during the RFA contained detected concentrations of cis-1,2-DCE (SECOR 1996).

Previous groundwater sampling at monitoring well MW-24 located just southeast of Building 2, indicated the presence of chlorinated compounds that may be associated with process residuals. It had been speculated that potential sources of these residuals could be the previously unknown UST, the sump located in Building 3, the former process sewers associated with Outfall 2, and the interceptor sewer that discharged from this area (SECOR 1996).

To better characterize the presence of Site-related constituents in the area near Building 2 and the area near Building 2A, soil borings were advanced for soil and groundwater sampling. After field screening for VOCs, soil samples were collected from each location at the approximate depth of sewers associated with former Outfall 2 and the interceptor sewer. Groundwater grab samples were also collected from the borings. Samples were sent to the laboratory for analysis of VOCs, TAL metals, and fluoride.

Building 2A

One surface soil sample, two subsurface soil samples, and four groundwater samples were collected from the Building 2A area. Subsurface soil and groundwater samples were analyzed for VOCs. Surface soil samples were analyzed for inorganics.

Surface Soil

Aluminum, antimony, beryllium, chromium, copper, iron, and potassium were detected above the Site-specific but below the regional background value. Only cadmium was above Site-specific and regional background values in the surface soil sample collected from this area (Table E-3).

Subsurface soils

VOCs were not present in subsurface soils above TAGMs (Table E-1) in the Building 2A area.

Groundwater

The compounds 1,2-dichloroethane (1,2-DCA), TCE, vinyl chloride (VC), and cis-1,2-DCE were detected in groundwater at concentrations greater than Class GA values (Table E-4). The constituent 1,2-DCA was not detected in three of the four samples and was detected just above the criteria at 1.0 ug/L (estimated concentration) in the fourth sample. VC was not detected in two wells and was detected at 3 ug/L in the remaining two wells, just above the criteria of 2 ug/L. Measured TCE concentrations ranged from 0.3 ug/L to 790 ug/L. Cis-1,2-DCE was not detected in two wells and was detected at 13 ug/L and 150 ug/L in the remaining two wells.

Screening Summary

Cadmium was the only soil constituent that exceeded both sets of background values in the single surface soil sample collected. For groundwater, 1,2-DCA, TCE, VC, and cis-DCE in groundwater exceeded Class GA values, although the VC and 1,2-DCA concentrations only marginally exceeded the criteria and were estimated values. VOCs detected in groundwater appear to originate from a different area since no VOCs were detected in soil samples above TAGMs.

Building 2

To investigate the presence of VOCs in media near Building 2, one surface soil, 23 subsurface soil, and 14 groundwater samples were collected and analyzed. For inorganics, one surface soil, eight subsurface soil, and nine groundwater samples were analyzed.

Surface soil

Antimony, chromium, copper, iron, lead, nickel, potassium, silver, sodium, and fluoride were detected above the Site-specific background value but below the regional background value in the surface soil sample. The single surface soil sample collected from this area contained levels of cadmium, mercury, and zinc greater than Site-specific and regional background levels (Table E-3).

Subsurface soil

The Building 2 area contained the highest detected concentrations of VOCs identified at the Site in subsurface soils. TCE was detected in all 23 subsurface soil samples and exceeded the TAGM in 18 of those samples (Table E-1). The detected concentrations of TCE ranged from 0.032 to 1,200 mg/kg. Other VOCs that exceeded their TAGM in at least one instance include 1,2-DCA, 1,1,2,2-tetrachloroethane (1,1,2,2-PCA), VC, acetone, toluene, and total xylenes. Measured concentrations of 1,2-DCA ranged from non-detected to 10 mg/kg and 1,1,2,2-PCA ranged from non-detected to 4.4 mg/kg. In addition, dense non-aqueous phase liquid (DNAPL) was observed via ultraviolet (UV) light screening in the soil during the installation of monitoring well MW-BI-01.

Aluminum, beryllium, chromium, copper, iron, nickel, potassium, and fluoride were detected above the Site-specific background value but below the regional background value in the subsurface soil samples (Table E-3). No inorganic analytes exceeded their Site-specific and regional background level in the subsurface soil samples.

Groundwater

The Building 2 area contained the highest detected concentrations of VOCs identified at the Site in groundwater (Table E-4). Groundwater contained TCE at concentrations up to 230,000 μg/L. Groundwater from the area around Building 2 contained TCE, 1,2-DCA, cis-1,2-DCE, VC, and toluene at concentrations greater than their respective Class GA values (Table E-4). Concentrations of cis-1,2-DCE exceeded Class GA values in all 14 groundwater samples, while TCE and VC exceeded in 13 out of the 14 samples. Groundwater concentrations of four inorganic constituents (iron, magnesium, manganese, and sodium) were greater than the Class GA values (Table E-5).

Screening Summary

Among the Site-related constituents detected in subsurface soil in the Building 2 area, TCE, VC, 1,2-DCA, and 1,1,2,2-PCA exceeded TAGM comparison values. In addition, evidence of DNAPL was observed in the soil at monitoring well MW-BI-01. In groundwater, TCE, VC, 1,2-DCA, cis-1,2-DCE, and toluene exceeded the Class GA values. Cadmium, mercury, and zinc were detected in surface soil above both background criteria, although no metals were detected above both criteria in subsurface soil. None of these three metals were detected in groundwater, although four other non-Site related metals/nutrients (iron, magnesium, manganese, and sodium) were detected slightly in excess of their respective criteria. Based on the data, the area around Building 2 appears to be a potential source area for chlorinated VOCs.

2.4 BUILDING 3 SUMP

Previous investigations at MW-24 indicated the presence of chlorinated compounds that may be associated with process residuals. The sump located in Building 3, which is just north of MW-24, had been identified as a potential source. A sample of sump water and a sludge/sediment sample were collected and submitted to the laboratory for analysis of VOCs, TAL metals, and fluoride, although the samples do not represent environmental media and evidence of leakage is not confirmed.

Sump Solids and Water

Concentrations of VOCs in sump solids and water were below the TAGMs and Class GA values, respectively (Tables E-1 and E-4). The following inorganic constituents were detected in sump solids at concentrations above the Site-specific and regional background levels for soils: arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc (Table E-3). The water sample collected in the sump did not contain any inorganic constituents above Class GA values (Table E-5).

Screening Summary

Although the sump samples were not collected from environmental media, soil and groundwater comparison values were used to provide some perspective on the relative magnitude of Site-related constituents present in the unit. Numerous inorganic analytes were detected in the solids sample above the comparison values. Only mercury is not commonly associated with picture tube manufacturing, based on USEPA data from that industry. Mercury was also detected at relatively low concentrations. However, none of these analytes were detected in the sump water above Class GA values, suggesting that the metals in the sump solids are not leachable.

2.5 BUILDING 7 AREA

Several USTs formerly located east of Building 7 were removed in October 1986. UST 005 held gasoline and USTs 006 and 007 contained diesel fuel. Soil samples collected during the RFA from this area did not indicate the presence of VOCs or SVOCs exceeding TAGMs. However, stained soils were noted in the backfill of the former USTs. Therefore, eight soil pile samples were collected from excavated material and were found to contain benzene, toluene, and xylene at concentrations above TAGMs. Groundwater samples were collected from MW-23 located south of Building 7, and contained TCE at concentrations up to 16,000 $\mu g/L$. However, the TCE is not related to the USTs.

During the RFI, sample locations near Building 7 were chosen to evaluate the potential impacts from the former backfill areas of USTs 005, 006, and, 007 and the former process sewers associated with Outfall 3, which discharged from this area. At least one soil sample from each boring was analyzed for VOCs, TAL metals, and fluoride. Groundwater samples were also collected from select borings and analyzed for the same parameters. Nine subsurface soil samples and seven groundwater samples were analyzed to characterize the presence of VOCs, and five subsurface soil and groundwater samples were analyzed to characterize the presence of inorganics.

Subsurface Soil

VOCs were below TAGMs in seven of the nine subsurface soil samples analyzed (Table E-1). Benzene, 1,2-DCA, TCE, and total xylenes were each detected at concentrations greater than their TAGMs in one of the two other subsurface soil s rples. Benzene and xylenes were detected in B7-03 and TCE and 1,2-DCA were detected in B7-04. The levels of aluminum, beryllium, chromium, iron, potassium, and fluoride measured in subsurface soils near Building 7 were above the Site-specific background value, but below the regional background values (Table E-3). No metals exceeded both criteria.

Ground Water

In groundwater at the Building 7 area, several VOCs were detected at concentrations above their Class GA values (Table E-4). Compounds including BTEX, 1,2-DCA, cis-1,2-DCE, and TCE exceeded their Class GA values in at least one of the seven groundwater samples. Several inorganic constituents were identified in the groundwater at the Building 7 area. Iron, magnesium, and sodium were each detected in at least one groundwater sample at concentrations greater than their respective Class GA values (Table E-5), although these are believed to be non-Site related metals/nutrients.

Screening Summary

Among the Site-related soil constituents detected in the Building 7 area, benzene, 1,2-DCA, TCE, and total xylenes exceeded TAGMs. In groundwater, BTEX, 1,2-DCA, cis-1,2-DCE, and TCE exceeded Class GA values. BTEX exceedences were in the same sample (B7-GW-03), which is also located closest to the former USTs. The chlorinated solvent results were distributed across the borings in the area at relatively low levels, with the exception of one boring located near MW-23. Based on the data, the immediate area around the former USTs appears to be a potential source area for BTEX compounds, although it is not clear if the chlorinated VOCs are related to Building 7 or an adjacent potential source area.

2.6 BUILDING 9A AREA

Building 9A is attached to the south end of Building 9. Soil boring locations near Building 9A were advanced to further evaluate the potential impacts from the former backfill area of USTs 005, 006, and, 007, outside of Building 9, near the former truck dock. These are the same USTs that were addressed as part of the Building 7 sampling. Borings were advanced south of Building 9A to a minimum depth of 12 feet bgs. Based on field screening results for VOCs, at least one soil sample from each boring was analyzed for VOCs and SVOCs. If groundwater was encountered, groundwater samples were collected and analyzed for VOCs, TAL metals, and fluoride. Five subsurface soil samples and two groundwater samples were collected.

Subsurface Soil

At the Building 9A area, VOC and SVOCs were not detected above TAGMs in any of the five soil borings tested (Tables E-1 and E-2).

Groundwater

Groundwater concentrations of TCE and cis-1,2-DCE were above Class GA values in both of the wells tested. Trans-1,2-DCE and VC were detected at concentrations greater than their Class GA values in one of the two wells (Table E-4). Inorganic constituents were present at levels above Class GA values in groundwater (Table E-5). Iron, magnesium, manganese, and sodium were each detected in at least one sample at concentrations greater than their respective Class GA values. As stated previously, these same four constituents are not believed to be Site related.

Screening Summary

No VOCs or SVOCs exceeded the TAGMs soil criteria. For groundwater, cis- and trans-1,2-DCE, TCE, and VC exceeded Class GA values. However, the former petroleum storage tanks in the Building 9A area, which were the target of the investigation, are not the source of the chlorinated compounds detected in the groundwater. The groundwater constituents are likely attributable to impacts associated with Building 7.

2.7 BUILDING 11 AREA

Soil samples collected during the RFI indicated the presence of cis-1,2-DCE in two soil borings at concentrations above TAGMs. The measured concentrations of cis-1,2-DCE increased with increasing depth. In addition, groundwater samples collected from MW-22 (located south of Building 11) and MW-25 (located southeast of Building 11) contained TCE, cis-1,2-DCE, benzene and toluene at concentrations above NYSDEC standards for Class GA waters.

As part of the current RFI activities, additional soil and groundwater samples were collected near monitoring well MW-25 to evaluate potential residual migration along the interceptor sewer and other nearby potential sources, such as the former drum storage areas and the former TCE tank inside the building. Field screening for VOCs was conducted for soil samples collected from borings near Building 11. Groundwater samples were collected from the borings and analyzed for VOCs, TAL metals, and fluoride. Sixteen soil samples and eleven groundwater samples were analyzed for VOCs. Inorganic constituents were characterized via collection and analysis of one surface soil sample, thirteen subsurface soil samples, and seven groundwater samples.

Surface Soil

Aluminum, antimony, beryllium, chromium, iron, nickel, potassium, and fluoride were detected above the Site-specific background value, but below the regional background value in the one surface soil sample. The single surface soil sample collected from this area contained levels of cadmium and zinc greater than the Site-specific and regional background levels (Table E-3).

Subsurface Soil

In the Building 11 area, acetone, TCE, and toluene were detected above TAGMs in subsurface soil (Table E-1). TCE exceeded its TAGM in 5 of the 16 subsurface soil samples analyzed. The highest concentration of TCE in subsurface soil was at B11-SBS-02 (14 to 16 feet bgs), at a concentration of 140,000 μg/kg. At greater depths from the same sample boring (24 to 26 feet bgs), TCE concentrations were lower (3,600 μg/kg) but still exceeded TAGMs. Toluene was detected in three of the samples, with the maximum detected concentration of 2,100 ug/kg. The maximum concentration of acetone was 5,400 ug/kg.

Aluminum, antimony, beryllium, chromium, iron, manganese (one sample), nickel, and potassium were detected above the Site-specific background value but below the regional background value in the subsurface soil samples (Table E-3). Only cadmium and magnesium (one sample) exceeded their Site-specific and regional background level in the samples. However, most of these values only barely exceeded the criteria (cadmium was 1.2 and 1.4 versus 1.0, and magnesium was 57,300 versus 55,100).

Groundwater

VOCs were detected at concentrations above Class GA values in 10 of the 11 wells sampled (Table E-4). The following eight VOCs were detected at levels above their respective TAGMs: 1,1,-DCA, 1,1,1-TCA, cis-1,2-DCE, acetone, chloroform, toluene, TCE, and VC (Table E-1). The highest concentrations of VOCs were detected near B11-GW-09 where TCE was detected at

230,000 µg/L. The highest concentrations of acetone and 1,1-DCA in the Building 11 area were located in B11-GW-09 and B11-GW-10. These boring locations are adjacent to former outdoor drum storage areas where releases are known to have occurred.

Inorganic constituents in groundwater were above screening criteria for 6 of the 24 analytes. Cadmium, iron, magnesium, manganese, sodium, and zinc were detected in groundwater from Building 11 at concentrations above Class GA values (Table E-5). However, only the cadmium and zinc are believed to be Site-related constituents. The other four metals/nutrients have been detected throughout the Site above Class GA values.

Screening Summary
The former drum storage areas south of Building 11 may be potential source areas for the identified VOCs, cadmium, and zinc, since these constituents were detected in both soil and groundwater samples above their respective criteria.

2.8 SIX-INCH EFFLUENT LINE AREA

Static leak testing conducted in accordance with the Sewer Evaluation work plan indicated that the 6-inch effluent line had the potential for leakage (Keystone 1992). However, a subsequent video inspection did not reveal any major line breaks or failures. To investigate if the line is a source of Site-related constituents in the soil, borings were advanced within and below the sewer backfill material. Field screening for VOCs was conducted and soil samples from each of two borings were analyzed for VOCs, TAL metals, and fluoride.

Subsurface soil
Subsurface soils near the 6-inch effluent pipe did not contain VOCs above TAGM levels in either of the two samples analyzed (Table E-1). The subsurface soil samples detected inorganic constituents above Site-specific background values but below regional background values including aluminum, beryllium, chromium, iron, nickel, potassium, sodium, and fluoride (Table E-3). Arsenic, cadmium, and zinc were detected in one of the two samples at a concentration greater than both background criteria. However, the arsenic criteria was barely exceeded (12.8 versus 12.0 mg/kg).

Screening Summary
Cadmium and zinc are the only constituents detected in the subsurface soil near the 6-inch effluent pipe at concentrations in excess of both background values, although it is not clear that

the effluent line is the source of those constituents. Impacts observed at Building 11 may be the source of these constituents.

2.9 BUILDING 9 AREA

When trenching occurred approximately 35 feet south of former fuel oil UST 009 (located north of Building 9), stained soils were observed adjacent to the fill lines. One soil pile sample of excavated trench material contained concentrations of cis-1,2-DCE above TAGM levels. Benzo(a)anthracene, benzo(a)pyrene, and chrysene were also detected above their respective TAGM levels in one soil boring near the former UST. No SVOCs were detected in the other three soil borings located near the UST. Based on these previous findings, additional subsurface soil and groundwater samples were collected to characterize the area around Building 9. Each soil boring was advanced to a depth of at least 16 feet bgs. After field screening for VOCs, soil samples from each boring were analyzed for VOCs, SVOCs, and inorganics. If groundwater was encountered in sufficient quantity, samples were analyzed for VOCs. Six subsurface soil samples and four groundwater samples were collected.

Subsurface Soil

In the Building 9 area, VOCs were not detected above TAGM levels in five of the six soil borings. The remaining boring contained only acetone above the TAGM level at B9-02 (Table E-1). SVOCs were detected above TAGM levels in one of the six subsurface soil samples (Table E-2). At location B9-04, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, chrysene, and dibenzo(a,h)anthracene were present at concentrations above TAGM levels.

The subsurface soil samples detected the following inorganic constituents above Site-specific background values but below regional background values: aluminum, antimony (one sample with an estimated value), beryllium, chromium, iron, nickel, and potassium (Table E-3). Copper was detected in only one sample at a concentration greater than both background criteria.

Groundwater

Groundwater from the Building 9 area contained 1,2-DCA and cis-1,2-DCE at low concentrations just above Class GA values (Table E-4), although none of these chlorinated solvent compounds were detected in soil samples.

Screening Summary

Acetone, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, and chrysene were detected in subsurface soil at Building 9 at a concentration above their

TAGM levels in one sample each. The only constituent to exceed both background soil criteria was copper, in one of the six samples. The concentrations and distribution of soil constituents suggest that a small pocket of relatively immobile and low-level Site-related residuals exist in the Building 9 area near the former UST 009. The chlorinated solvent VOCs detected in groundwater above Class GA values appear to originate from another source area.

2.10 MW-20 AREA

MW-20 is located along the northern edge of the Site. Vinyl chloride and cis-1,2-DCE have been routinely detected in MW-20 at concentrations exceeding their respective Class GA values. However, the low concentrations of VC and cis-1,2-DCE have been declining since monitoring was initiated. The relatively minor impacts at MW-20 appear to be isolated and have minimal potential for impacting off-Site areas.

To evaluate whether two former drainage pipes near MW-20 have impacted groundwater, direct push soil borings and temporary groundwater sampling points were installed. Soil borings and temporary groundwater sampling points were located at the end of each pipe and between the pipes and MW-20. In addition, temporary groundwater grab sampling points were located between MW-20 and the northern property boundary. After field screening for VOCs, four subsurface soil samples and five groundwater samples were analyzed for VOCs. Additionally, three subsurface soil samples were collected for SVOCs and one surface soil sample was collected for inorganics.

Surface Soil
Aluminum, beryllium, iron, nickel, potassium, and fluoride were detected at concentrations above their respective Site-specific background values but below the regional background values. The single surface soil sample collected in the MW-20 area contained only cadmium above both background values (Table E-3).

Subsurface Soil
Concentrations of VOCs in subsurface soils were below TAGM levels in the five soil samples analyzed (Table E-1). SVOCs were present in subsurface soils above TAGM levels in two of the three subsurface soil samples analyzed (Table E-2). Benzo(a)pyrene is the only constituent that exceeded its TAGM level in boring SBS-01. Several polynuclear aromatic hydrocarbons (PAHs) exceeded their TAGM levels in boring SBS-04, including benzo(a)anthracene, benzo(a)pyrene, chrysene, and dibenzo(a,h)anthracene.

Ground Water

Concentrations of VC and cis-1,2-DCE were above Class GA values in one groundwater sample (Table E-4).

Screening Summary

Benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, and chrysene were detected in subsurface soil at Building 9 at a concentration above their TAGM levels. The only constituent to exceed both background soil criteria was cadmium, in the single surface soil sample. The concentrations and distribution of soil constituents suggest that a small pocket of relatively immobile and low-level Site-related residuals exist in the MW-20 area. The low concentration chlorinated solvent VOCs detected in groundwater above Class GA values appear to originate from another area, possibly off-Site.

2.11 BUILDING 13 FUEL OIL TANK AREA

When trenching was conducted for installation of a new storm sewer line in the early 1990s, stained soils were observed near a former fuel oil tank. However, VOCs were not detected in soil samples collected from trench sidewalls and a soil pile. Soil samples collected during the RFA indicated the presence of eight SVOCs in the soil (0.5-2 feet bgs) at concentrations above their respective TAGM levels.

To evaluate soil conditions in the area, additional soil and groundwater samples were collected and analyzed. Based on field screening results for VOCs, soil samples from each of the soil borings were composited at 2-foot intervals and submitted for SVOCs analysis. If groundwater was encountered in sufficient quantity, samples were collected and screened using a field gas chromatograph (GC). Samples were then sent to the laboratory for VOC analysis based on the highest potential for contamination. Four groundwater samples and one subsurface soil sample were analyzed for VOCs, and four subsurface soil samples were analyzed for the presence of SVOCs.

Subsurface Soil

VOCs in subsurface soils were all below TAGM levels (Table E-1) near the Building 13 fuel oil tank. Several PAHs were detected in subsurface soils slightly above TAGM levels (Table E-2) at one location. Soil boring SBS-01 (2 to 8 feet bgs) is the only boring where PAHs were detected at concentrations above TAGM levels. These PAHs are: benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, chrysene, and dibenzo(a,h)anthracene.

Ground Water
Benzene and ethylbenzene were detected in groundwater at concentrations just above their Class GA values in one well each (Table E-4).

Screening Summary
There were no VOCs detected in subsurface soils at concentrations above TAGM levels at the Building 13 fuel oil tank area, and only two VOCs were detected in groundwater at very low concentrations. However, five SVOCs were detected in subsurface soil at a level above TAGM levels in one boring. The concentrations and distribution of soil and groundwater constituents suggest that a small pocket of relatively immobile and low-level Site-related residuals exist in the area near the former Building 13 UST.

2.12 BUILDING 13 TRUCK DOCK AREA

During a previous investigation near the Building 13 truck dock area, groundwater analysis indicated 1,1-DCE, cis-1,2-DCE, TCE, and VC at concentrations exceeding their respective Class GA criteria at two sample locations. However, analytical results from groundwater collected at several other sampling points in the vicinity did not detect concentrations above the criteria.

As part of the current RFI, six direct push sampling points were advanced to a depth of at least 6 feet bgs near the Building 13 truck dock. Soil samples were collected at 2-foot intervals, screened in the field for VOCs, and analyzed for VOCs based on the field screening data. If groundwater was encountered in sufficient quantity, samples were collected and analyzed for VOCs. Two groundwater samples were collected based on the results of field GC screening of soil samples.

Subsurface Soil
VOCs were not detected in subsurface soil (Tables E-1) above TAGM levels at the Building 13 truck dock area.

Groundwater
VOCs were not detected in groundwater (Tables E-4) at concentrations in excess of Class GA values at the Building 13 truck dock area.

Screening Summary

No Site-related constituents were detected in soil or groundwater at concentrations above the respective soil and groundwater screening values.

2.13 HISTORIC OUTFALLS

The historic outfall (HO) areas were sampled to evaluate if the former surface water outfalls and the interceptor sewer trench outfall are potential sources of Site compounds. Surface soil/sediment samples were collected along Van Cleef Lake and along the canal area to evaluate the former outfalls. The samples were collected at the base of each of the historic outfalls and at the interceptor trench outfall (ITO). Sediment/soil samples were analyzed for VOCs, TAL metals, and fluoride. Three samples were collected from HO-1, HO-2, and the ITO; and one each was collected from HO-3, HO-4, HO-5, and HO-6/7.

Surface Soil Sediment

Surface soil/sediment samples collected from the HOs did not contain VOCs above TAGM levels (Table E-1). Concentrations of some inorganic constituents exceeded background levels in surface soil (Table E-3). The following sections present the inorganic results by outfall area.

HO-1

Aluminum, antimony, beryllium, chromium, copper, iron, mercury, nickel, potassium, silver, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in surface soil at HO-1 include cadmium and zinc (Table E-3).

HO-2

Aluminum, antimony, beryllium, chromium, copper, iron, nickel, potassium, silver, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in surface soil at HO-2 include cadmium and zinc (Table E-3).

HO-3

Aluminum, beryllium, chromium, iron, nickel, potassium, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in surface soil at HO-3 include only cadmium (Table E-3).

HO-4

Aluminum, antimony, barium, beryllium, iron, nickel, potassium, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in surface soil at HO-4 include cadmium, chromium, and zinc (Table E-3).

HO-5

Aluminum, antimony, beryllium, chromium, iron, nickel, potassium, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in surface soil at HO-5 include cadmium and zinc (Table E-3).

HO- 7

Aluminum, beryllium, iron, lead, nickel, potassium, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in surface soil at HO-6/7 include cadmium, copper, mercury, and zinc (Table E-3).

ITO

Three surface soil samples were collected from the ITO. Aluminum, antimony, beryllium, chromium, iron, nickel, potassium, and fluoride were detected above Site-specific background values, but below the regional background values. No constituents were detected above both background values in surface soil at the ITO (Table E-3).

Screening Summary

Surface soil/sediment samples collected from the historic outfalls contain several inorganic constituents at levels above both background criteria, with the most prevalent analytes being cadmium and zinc. ITO is an exception with no constituents above the relevant criteria, and HO-3 contained low levels of cadmium only.

2.14 GRASSY AREAS NEAR BUILDINGS

An investigation of the surface soils in grassy areas near on-Site buildings was performed to evaluate potential airborne deposition of Site related constituents. Surface soil samples were collected and composited from five grassy areas around the facility. These samples were collected according to New York State Department of Health (NYSDOH) draft guidance (NYSDOH 1995) and analyzed for TAL metals. Samples were collected from the grassy areas at locations in the Courtyard, MW-20, Building 2, Building 2A, and Building 11. The results for each of these samples are presented in the area-specific sections. They are also summarized in this section as a way to generally characterize the grassy areas interspersed throughout the building area.

Surface Soil

Inorganic constituents were detected in surface soil samples at concentrations above Site-specific and regional background levels in each of the areas tested (Table E-3), as summarized below:

- Building 2: Antimony, chromium, copper, iron, lead, nickel, potassium, silver, sodium, and fluoride were detected above the Site-specific background value but below the regional background value in the surface soil sample. Cadmium, mercury, and zinc were greater than both background levels.
- Building 2A: Aluminum, antimony, beryllium, chromium, copper, iron, and potassium were detected above the Site-specific but below the regional background value. Only cadmium was above Site-specific and regional background values in the surface soil sample collected from this area.
- MW-20: Aluminum, beryllium, iron, nickel, potassium, and fluoride were detected at concentrations above their respective Site-specific background values but below the regional background values. Only cadmium was detected above both background values.
- Building 11: Aluminum, antimony, beryllium, chromium, iron, nickel, potassium, fluoride were detected above the Site-specific background value, but below the regional background value in the surface soil sample. Cadmium and zinc were greater than both background values.
- Courtyard: Antimony, iron, nickel, and potassium were detected above the Site-specific but below the regional background value. Cadmium, copper, mercury, and zinc were greater than both background values. However, the mercury value was only barely exceeded (0.22 versus 0.2 mg/kg).

Screening Summary

The following inorganic constituents were detected in surface soils at concentrations above both background values at the grassy areas, with the frequency noted: cadmium (5 out of 5), zinc (3 out of 5), copper (1out of 5), and mercury (2 out of 5). These areas are being addressed as part of the specific building area each sample is associated with.

2.15 FIELDS EAST OF THE BUILDINGS

Surface soil samples were collected from the fields located east and southeast of the facility to identify potential airborne deposition of Site-related constituents in surface soil. Ten surface soil samples were collected and composited according to NYSDOH (1995) guidance and analyzed for TAL metals. The locations of samples FLD-SS-01 – 05 and 07 are approximately 300 to 600 feet away from the nearest edge of the Site buildings, in wooded or grassy areas. Sample locations FLD-SS-06, 08, 09 and 10 are inside of or adjacent to the Site roadways.

Surface Soil

Aluminum, beryllium, chromium, iron, manganese, nickel, potassium, thallium, and fluoride were detected above Site-specific background values, but below the regional background values. Constituents detected above both background values in the ten surface soil samples at the east fields include cadmium, nickel (one sample), and zinc (two samples).

Screening Summary

The following constituents exceeded both background criteria: cadmium, nickel, and zinc. The highest concentrations of these constituents were detected in the samples near the roadway (06, 08, 09, and 10).

2.16 INTERCEPTOR SEWER AREA

Previous investigations were performed to assess the potential for the interceptor storm sewer to serve as a preferential migration pathway for Site-related constituents in groundwater. Therefore, soil and groundwater samples were collected to determine if the interceptor sewer bedding is a potential source of Site-related compounds/residuals. Soil borings were advanced to at least 12 feet, the approximate depth of the sewer bedding. After field screening, seven soil samples were analyzed for VOCs. Groundwater was encountered in four borings/temporary wells and samples were analyzed for VOCs in all four, but TAL metals and total fluoride were only collected from three locations, apparently because the well went dry.

Subsurface Soil

Constituents in subsurface soils from along the interceptor sewer were all below TAGM levels (Table E-1).

Groundwater

Low concentrations of TCE, VC, cis-1,2DCE, and 1,1-DCA were detected in the groundwater samples above the Class GA values. Low concentrations of the inorganic constituent's manganese, magnesium, and sodium were detected above the Class GA values.

Screening Summary

Constituents in subsurface soils from the interceptor sewer area were below TAGM levels in all samples collected. Therefore, the VOCs detected in groundwater samples appear to be from other source areas. The temporary wells were located near Buildings 2 and 7, which are near suspected source areas. The inorganic constituents identified do not appear to be Site-related.

2.17 OVERBURDEN TEMPORARY WELL PAIRS

The objective of the overburden groundwater sampling in well pairs was to identify the vertical distribution and extent of Site-related constituents. Well pairs consisted of a shallow well (15 feet bgs) and a deeper well (25 feet bgs) to assess potential water quality differences at various depths, and to provide water level information to help evaluate groundwater flow. Two well pairs were installed near Building 11 and one well pair was installed near Building 2. One sample was collected from each of the wells, for a total of six samples for VOCs.

Groundwater

Well Pair 1 is located near Building 2. Both the shallow and deep wells contained concentrations of 1,2-DCA, cis-1,2-DCE, TCE, and VC at concentrations above Class GA values (Table E-4). Well Pair 2 is located near Building 11, just south of the pole barn. Both the shallow and deep well contained concentrations of the following VOCs above their respective Class GA values: cis-1,2-DCE, TCE, and VC (Tables E-4). Well Pair 3 is located near Building 11, just west of the former tank farm area. Constituents detected in the shallow well were below their respective Class GA values, although TCE was detected in the deep well at a concentration just above its Class GA value.

Screening Summary

Several chlorinated VOCs were detected in the well pairs above Class GA values, with the exception of the shallow well at Well Pair 3. The concentrations were generally higher in the shallow wells, although the correlation was less apparent as overall concentrations decreased and there were fewer compounds for comparison. The detected constituents will be addressed as part of the Building 2 or Building 11 areas.

2.18 BEDROCK INTERFACE MONITORING WELLS

A total of three BI monitoring wells were installed. Two of the BI wells were installed at locations chosen in collaboration with NYSDEC. A third well, which was not scoped in the work plan addenda, was installed near the pole barn where VOCs were detected in groundwater and soil. These BI wells were installed to collect sufficient data to: evaluate whether a confining layer is present on-Site; avoid cross contamination between distinct lithologic zones separated by a definable confining layer; investigate the presence or absence of residual or dissolved solvents at the bedrock interface; and if residuals were detected, evaluate the potential for horizontal migration along the overburden-bedrock interface.

Six soil samples were collected from MW-BI-01, which is near Building 2; three samples were collected from MW-BI-02, which is near Building 7; and three samples were collected from MW-BI-03, which is near Building 11. These samples were analyzed for VOCs. The BI wells did not produce water, so no groundwater samples were collected during the RFI.

Subsurface Soil

The samples collected from bedrock interface monitoring wells near Buildings 7 and 11 did not contain VOCs at concentrations above TAGM levels. The six samples were collected near Building 2 between 24 and 35 bgs, where bedrock was encountered. A thin sand lens was observed at 24 feet, and the impacted layer down to bedrock was composed of clay. The samples contained TCE at concentrations well above TAGMs, which likely caused other lesser constituents to be diluted out during analysis. The sample from 30 feet bgs had a TCE concentration of 1,200,000 ug/kg, approaching the soil saturation value of 1,300,000 ug/kg. In addition, soil screening via UV light indicated the presence of free product DNAPL within the soil core at about 28 ft bgs.

Screening Summary

TCE in subsurface soil near Building 2 was detected at concentrations above its TAGM level. A few other chlorinated compounds were detected as well, but others were likely diluted out by the high TCE concentrations. Groundwater was not produced in any of the wells. The compounds detected in soil from MW-BI-02 and 03 were all below TAGM levels.

2.19 BEDROCK MONITORING WELLS

Existing RFI data (collected from soil borings, temporary groundwater wells, and bedrock interface monitoring wells), and the ongoing groundwater monitoring program were evaluated.

The existing data set did not provide a sufficient basis for evaluating the bedrock groundwater. In April 2001, in collaboration with NYSDEC, GTEOSI agreed to install six bedrock wells. Figure 8 presents the locations of bedrock monitoring wells, which were installed around the perimeter of the facility. Groundwater and subsurface soil samples from the six bedrock monitoring wells were submitted for VOC analyses. The objectives of this task were to evaluate the nature of bedrock groundwater and the flow direction at the Site; the potential for migration of Site-related residuals to bedrock groundwater; and the potential for off-Site migration of residuals in bedrock groundwater.

Subsurface soil

The concentrations of VOCs detected in the subsurface soils during installation of the bedrock wells were all below TAGM levels (Table E-1).

Groundwater

The well located south of the electric power substation near Van Cleef Lake (MW-BR-06) contained TCE above its Class GA value (Table E-4). None of the other bedrock monitoring wells contained VOCs at concentrations above their respective standards. However, the boring log for MW-BR-06 suggests that it does not monitor groundwater in the bedrock. Drilling ceased upon auger refusal at 72-74 feet bgs and the 30-foot screen covers a zone of silt and gravel layers, with some sand, not competent limestone bedrock. The boring log, however, indicates that the top of weathered bedrock was interpreted to start at 24 feet bgs. The well location probably represents the face of the escarpment that is normally under water due to the presence of the dam. The eroded face of the escarpment was probably filled in with lake sediments over the years following construction of the dam.

Screening Summary

There were no constituents detected in soil collected from the bedrock monitoring wells at concentrations above both TAGM levels. TCE in groundwater from well MW-BR-06 was above the Class GA value. However, the manner in which the well was constructed suggests that bedrock groundwater is not being monitored.

2.20 INTERCEPTOR SEWER EFFLUENT WATER

During the RFI, the interceptor sewer bedding was evaluated by advancing soil borings along the sewer pathway (See Section 2.16 above). The materials surrounding the sewer pipe consisted of native-soils, which were primarily silty clays. Therefore, the bedding material does not appear to be a preferential migration pathway. Review of analytical results from the soil borings supports this conclusion. While the sewer bedding has been ruled out as a migration pathway, infiltration into and transport of Site residuals via the interceptor sewer system has not been evaluated.

Storm water is collected from the facility roof drains and outdoor catch basins. Most of this run-off is collected via an interceptor sewer, which runs along the south side of the facility. An interceptor sewer flow house is located in the southeast corner of the Site and is the last location where storm water effluent is accessible before the sewer discharges directly into the canal. Some sewer laterals run through areas where Site related constituents have been detected. In the event of a breach in the sewer, effluent could act to transport infiltrated residuals from subsurface source areas to the sewer-discharge point in the Seneca River. A water sample was collected from the interceptor sewer flow house, which is located in the southeast corner of the Site. The flow house is the last location where the effluent is accessible before the sewer discharges into the Seneca River. The sample was analyzed for VOCs.

Effluent Water
The grab sample (EFF-FH-01) contained cis-1,2-DCE and TCE above NYS Class GA values.

Sampling Summary
Two chlorinated solvent compounds are present at low concentration in the effluent water, suggesting that infiltration through a sewer lateral is possible.

2.21 SURVEY OF REMAINING SUMPS AND PITS

A sump and pit survey was performed as part of Addendum #3. The objective of the survey was to locate remaining Site sumps and pits. Many of the indoor sumps and pits were abandoned and filled with concrete during previous facility closure efforts (Chester 1995b). A total of 25 sumps, pits, or other subsurface structures were encountered and documented by O'Brien & Gere. The function or type of pit (cistern, steam condensate collection) was not determined. The survey was conducted by a team of two environmental professionals that systematically traversed the interior and exterior of the facility looking for subsurface structures that could have the potential to hold and transport water. When subsurface structures were encountered, the location was marked on a figure, a photograph was normally taken, and a brief description was noted. The only sump that has been sampled is in Building 3 (See Section 2.4). None of the other sumps and pits have been identified as potential sources of Site-related constituents in soil or groundwater. See Figure 11 and the photolog (Appendix G) for the locations of sumps and pits.

3.0 DATA SUMMARY

This section presents an evaluation of the impacts by Site-related residuals including the following:

- Identify specific residuals that are Site related;
- Identify the affected Site media;
- Identify potential source areas; and
- Assess whether the residuals exceed residential use criteria (unrestricted) values;

3.1 IDENTIFICATION OF SITE RELATED RESIDUALS AND MEDIA

For this evaluation, residual concentrations in soil and groundwater have been compared to NYSDEC TAGMs and TOGs recommended cleanup values, USEPA Region 9 PRGs, and background values. Residuals that exceeded applicable guidance, standards, and/or background concentrations have been identified for further evaluation. The residuals that have been detected above applicable guidance values, standards, and background values are summarized on Tables in Appendix E. The following subset of constituents have been identified as residuals that exceed the applicable guidance values, standards, or background values, with a degree and frequency that warrants further evaluation.

VOCs:

Soil: TCE, 1,2-DCA, VC, benzene; toluene; xylenes; acetone
Groundwater: TCE, 1,1-DCA, 1,2-DCA, VC, cis- and trans-1,2-DCE, 1,1,1-TCA, BTEX, chloroform, acetone

SVOCs:

Soil: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene, dibenzo(a,h)anthracene; chrysene; benzo(k)fluoranthene

Inorganics:

Soil: cadmium, copper, zinc
Groundwater: cadmium, zinc

3.2 POTENTIAL SOURCE AREAS

Several VOCs (TCE and daughter products in particular) have been detected in soil and groundwater at their highest concentrations in three areas along the southern portion of the Site. These areas are Building 2 near MW-24, Building 7 near MW-23, and Building 11 near MW-25. The specific sources of these constituents have not been confirmed, although historic drum failures are documented in or near each of these areas. The drums that failed contained mixed chlorinated solvents. In addition, during the rerouting of the process water sewer lines, several areas along the trenches were excavated and disposed because they had been impacted by Site related constituents. Many of these areas are adjacent to or near those sampling locations listed above. There have also been reports of a pit in or near Building 2 where TCE was dumped historically.

Bedrock interface monitoring well MW-BI-01 (located approximately 80 feet southwest of MW-24), is the only location where DNAPL was directly observed (at 25 to 30 feet bgs). DNAPL was observed in soil samples collected during installation of this well. Soil samples collected from this location indicate that the DNAPL consists primarily of TCE. The specific manner in which the DNAPL migrated to its current location is not completely understood. However, a sump in Building 3 was used to dump TCE historically and the first manhole at the end of that sewer line is adjacent to the location of this boring. A sand lens just above the impacted soil layers may also have allowed the TCE to migrate here from a location closer to the building. The presence of DNAPL below the water table near MW-BI-01 is likely a continuing source of residuals to overburden groundwater. However, the well is screened from 30-35 feet bgs and is set into the top of competent bedrock, but has remained dry since it was installed. Therefore, the potential for vertical migration to bedrock groundwater is reduced.

DNAPL has not been directly observed elsewhere on the Site. The TCE and related constituents detected in overburden and bedrock groundwater at the Site occur as dissolved phase constituents. However, the potential presence of DNAPL in the overburden soils may be inferred from concentrations of constituents in groundwater that are greater than 1% of their pure phase solubility ("1% rule of thumb" - USEPA 1994). For TCE, 1% of the pure phase solubility is equal to 11 mg/L. In the Building 11 area, just as in the Building 2 area, dissolved TCE was detected in overburden groundwater samples collected from temporary wells at concentrations in excess of this value, suggesting that DNAPL may exist in this area as well.

3.3 PRELIMINARY RISK COMPARISON

The previous sections have identified those constituents that are considered to be Site-related residuals. Although a complete exposure pathway analysis and risk assessment is not included in this report, a basic comparison to published risk values was conducted as a screening tool to eliminate from further consideration those constituents and media that do not pose unacceptable risk. The Region 9 PRGs have been used in this document previously in cases where a TAGM or TOG value was not available. In those cases, the residential soil exposure criteria or tap water criteria were used as a conservative surrogate value based on unrestricted use, even though the Site is clearly limited to industrial/commercial use currently and in the foreseeable future. The same PRG criteria are used again in the following section of this report, to determine whether the identified Site-related constituents warrant any future consideration.

4.0 CONCLUSIONS

The RFI has provided data that can be used to evaluate the potential impacts from Site-related constituents. Available data are sufficient to perform an evaluation of the current Site conditions and possible exposure pathways. A formal risk assessment may be necessary to determine what additional actions or controls may be necessary to reduce risk to acceptable levels. The purpose of the RFI is to identify releases from SWMUs or Areas of Concern (AOCs) that may warrant corrective action. Therefore, using the available data and Site information, certain areas can be removed from further consideration and others will be retained for additional possible actions (additional investigation, risk assessment, interim control measures, or corrective actions). This process is often iterative and results in a focusing of limited resources on those units or areas that represent the greatest risks to human health and the environment, until such risks are reduced or controlled to acceptable levels. A more detailed discussion of RFI conclusions is presented by investigative area in the remainder of this section.

4.1 AREAS REQUIRING NO FURTHER ACTION

Based on the results of the RFI, which are presented in Section 2, the following investigative areas require no further action (NFA) in the form of additional investigation or remedial action.

4.1.1 NFA Based on Screening Comparison

Based on the results of the screening approach presented in Section 2, several investigative areas were screened out. That is, a comparison of analytical results with NYSDEC or surrogate screening values for these areas indicated that there were no Site-related constituents exceeding the screening values. The following areas, therefore, were screened out and require NFA.

- **Building 9A** (See Section 2.6)
- **Building 13 Truck Dock Area** (See Section 2.12)
- **Historic Outfalls - ITO only** (See Section 2.13)
- **Grassy Areas Near Buildings** (See Section 2.14) This "area" does not represent a specific potential release point or area. Rather, the samples referred to collectively here are incorporated into the specific building or release area where they were collected.
- **Interceptor Sewer Areas - soil** (See Section 2.16)

- **Overburden Temporary Well Pairs** (See Section 2.17) This "area" does not represent a specific potential release point or area. Rather, the samples referred to collectively here are incorporated into the specific building or release area where they were collected.
- **Bedrock Interface Wells** (See Section 2.18) This "area" does not represent a specific potential release point or area. Rather, the samples referred to collectively here are incorporated into the specific building or release area where they were collected.
- **Bedrock Monitoring Wells** (See Section 2.19) Only one constituent was above Class GA criteria in one well, and that well is not a true bedrock groundwater monitoring well.

4.1.2 NFA Based on Qualitative Assessment

In addition to the areas with results indicating no exceedance of NYSDEC screening values for Site-related constituents, several investigative areas require NFA since the detected concentrations were of low frequency or marginally exceeded screening values, and are below the USEPA Region 9 PRGs for unrestricted residential use.

- **Courtyard Area** (See Section 2.2) The concentrations of cadmium, copper, and zinc in the single surface soil sample are orders of magnitude below the PRG residential soil criteria. The low concentrations of TCE and xylenes in groundwater are likely from another source area since no VOCs were detected above TAGM levels in any of the soil samples.
- **Building 2A** (See Section 2.3) The concentrations of cadmium in soil samples are orders of magnitude below the PRG residential soil criteria. The concentrations of TCE and daughter products in groundwater are from another source area (most likely the adjacent Building 2 area) since no VOCs were detected above TAGMs in any of the soil samples.
- **Building 3 Sump** (See Section 2.4) Numerous metals were detected above screening values for soils, but sump solids are not an environmental media and the sump is not considered a continuing source of Site-related constituents. The sump water itself, as well as soil and groundwater from B2-05, located immediately adjacent to the sump, contained no metals above any NYSDEC criteria. In addition, no VOCs were detected in the sump solids or water.
- **Six-inch Effluent Line Area** (See Section 2.8) Cadmium and zinc exceeded the screening comparison values in one of two soil samples. However, no other VOCs or metals were detected in excess of relevant criteria from samples in this area. The concentrations of cadmium and zinc in soil samples are well below the PRG residential soil criteria.

- **Building 9** (See Section 2.9) Acetone, copper, and five SVOC compounds were detected in one of six soil samples above TAGM levels. The acetone and copper concentrations are well below the residential soil PRG. The SVOC constituents appear to be in an isolated pocket of relatively immobile residuals near the former fuel oil UST. Two very low concentration TCE daughter products detected in groundwater above Class GA values appear to originate from another source area, since no chlorinated VOCs were detected in the six soil samples above TAGM levels.
- **MW-20 Area** (See Section 2.10) No VOCs were detected above TAGM levels in the four subsurface soil samples analyzed. Instead, several PAH compounds and cadmium were detected at low to moderate levels in two samples. These results do not explain the source of the TCE daughter products in MW-20 and are likely the result of historic fill materials in the ground in this area, which is near the historic railroad siding.
- **Building 13 Fuel Oil Tank Area** (See Section 2.11) Several SVOC compounds were detected above TAGM levels in only one of four samples at relatively low concentrations and no VOCs were detected. Benzene and ethyl benzene were detected at levels just above Class GA values in one well each, but may be from another source since no soil VOCs exceeded TAGM levels. The SVOCs represent an isolated pocket of relatively immobile residuals near the former fuel oil UST.
- **Historic Outfall HO-3 only** (See Section 2.13) Cadmium was the only constituent that exceeded the background criteria, but the value is well below the residential soil PRG.
- **Fields East of the Buildings** (See Section 2.15) A total of ten surface soil samples were collected from this area. Four metals were detected above TAGMs in several samples. However, those constituents are well below the residential soil PRGs.

4.2 AREAS WITH RESIDUAL SITE-RELATED CONSTITUENTS

The results of the RFI indicate that several investigative areas contain Site-related constituents at concentrations and frequencies that may warrant further consideration. TCE and its daughter products are the primary Site related constituents. Soil containing TCE and daughter products could be acting as ongoing potential sources to impact Site groundwater and/or surface water. Therefore, the primary focus of the RFI is to identify soils impacted with these constituents that may be acting as continuing sources to other media. Other areas of the Site have been impacted to a lesser degree by BTEX, acetone, cadmium, or zinc. The areas that warrant further consideration are presented below.

- **Building 2** (See Section 2.3) Based on the data obtained, it appears that this area likely represents a source area for TCE and its daughter products. A letter from a former plant manager indicates that there was a pit near the old paint shop in this area where TCE was dumped historically. Soil from the sewer trenches was removed and disposed due to impacts from Site related constituents. Indications of DNAPL were observed in the soil boring at monitoring well MW-BI-01 just down gradient from this area. This area should be a primary focus of future actions.

- **Building 7** (See Section 2.5) Low to moderate concentrations of TCE-related and BTEX-related compounds were detected in a majority of the samples in this area. Historic spills or impacted soils in sewer trenches are potential sources of the Site related constituents. However, it is possible that the impacts observed in this area are attributable to another nearby source (i.e. on the fringe of a more distinct source area).

- **Building 11** (See Section 2.7) TCE, acetone, and toluene, as well as cadmium and zinc have been identified above the relevant criteria in this area. The VOC concentrations in this area are substantial enough that this area could also be considered a possible source area. A former drum storage area where spills occurred was identified in this area and a historic map indicates that a TCE tank was present inside. No direct evidence of DNAPL was obtained from this area but it can be inferred from some of the groundwater values. This area should be a primary focus of future actions, in addition to the Building 2 area.

- **Historic Outfalls HO-1, 2, 4, 5, and 6/7** (See Section 2.13) Cadmium was the only constituent that exceeded the background criteria and the residential soil PRG. Additional risk assessment analysis may be required to determine the significance of these concentrations in the soil/sediment.

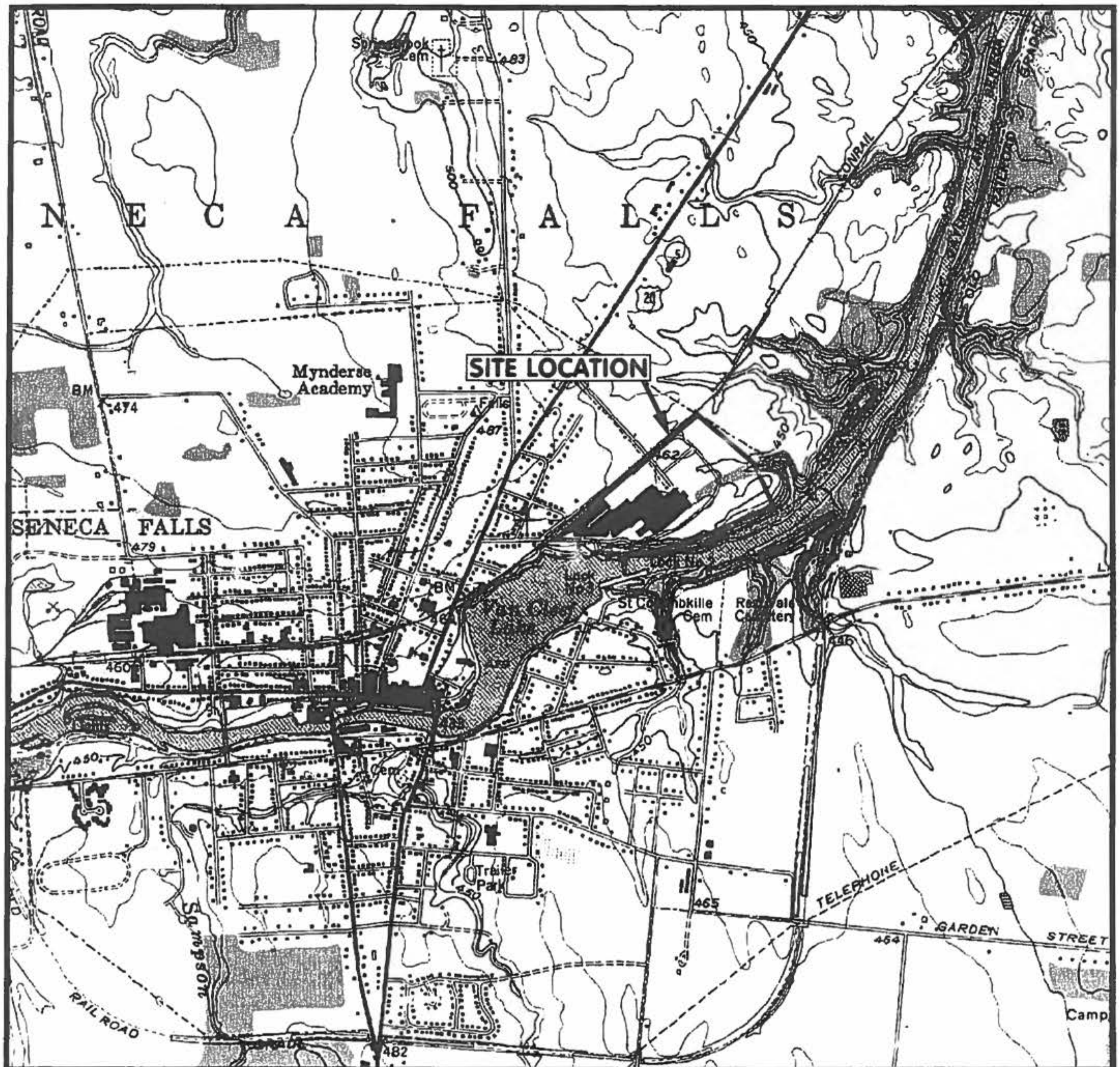
- **Interceptor Sewer Effluent** (See Section 2.20) Two chlorinated solvent compounds are present at low concentration in the effluent water, suggesting that infiltration through a sewer lateral is possible. This result should be confirmed and additional data should be collected to isolate the potential source of these constituents.

- **Remaining Sumps and Pits** (See Section 2.21) A total of 25 sumps, pits, or other subsurface structures were encountered and documented by O'Brien & Gere, although their functions were not determined. The only sump that has been sampled is in Building 3. None of the other sumps and pits have been identified as potential sources of Site-related constituents in soil or groundwater. Several sumps and pits contained water and were located near areas where constituents were detected in groundwater. More detailed information regarding the structure and function of these sumps and pits should be collected.

4.3 SITE-WIDE CONCLUSIONS

The distribution of the predominant Site related constituents (TCE and daughter products), is primarily in areas on the south (down gradient) side of the facility. Specifically, Building 2 and Building 11 represent likely or possible source areas. The Building 7 area, which lies between those two potential source areas, may represent the fringe area of one or both of the potential source areas, or may represent an unrelated diffuse area of impact. It is unclear if the identified constituents are the result of a single or multiple releases. However, they are contained in impermeable soils and were detected primarily in areas along the south side (down gradient) of the facility. In addition, the presence of daughter products demonstrates that TCE is degrading in the environment. In some areas, TCE is not detected and only the daughter products remain.

The goal of future efforts at the Site should involve a focusing of resources on those areas identified in Section 4.2 above, and completion/termination of efforts at other low and moderate priority areas of the Site. A large amount of historic data exists for this Site, and the low and moderate priority units or areas that do not pose an unreasonable risk to human health and the environment should be eliminated. As this iterative process moves forward, future efforts will be able to better target and resolve those areas identified in Section 4.2. Concurrent with this effort, further investigation of the Site hydrology and hydrogeology will be performed to develop successful strategies to mitigate the risks posed.



SCALE: 1:24 000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

NORTH

MAP REFERENCE:

PORTION OF U.S.G.S. QUADRANGLE MAP
7 ½ MINUTE SERIES (TOPOGRAPHIC)
SENECA FALLS, NEW YORK 1953
PHOTOREVISED 1978

QUADRANGLE LOCATION

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 1
SITE LOCATION MAP

DATE: MAY 7, 2002	
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: SB
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008
PHONE: 847.228.0707
FAX: 847.228.1115

SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 2
SITE LAYOUT AND SAMPLE LOCATION MAP

DATE: MAY 16, 2002	
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: SB
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

SWMU #	KEY TO SOLID WASTE MANAGEMENT UNIT DESCRIPTION
	Primary Storage Areas - SO1A and SO1B
1	SO1A - pole barn
2	SO1B - Area adjacent to the pole barn
3	Chemical storage bay IV
4	10 cubic yard filter cake lugger box previously located at WWTP
	Interim Storage Areas - SO1C and SO1D
5	SO1C - adjacent to incinerator
6	SO1D - Building #7 Truck Dock
	Satelite Storage Areas - SS-1 through SS-13
7	Waste Oil Collection Point - Building. #1
8	Coating Preperation Room - Building #4
9	Glass Buffing Dust Collector - Building #9
10	Frit Room - Building #10
11	Hydrofluoric Salvage Washing Pit - Building #13
12	Matrix Mix Room - Building #7
13	Fork Lift / Repair Area - Building #3
14	External Conductive Coating Mix Room- Building #7
15	Drum Collection Area - Building #11
16	Chemical Preperation Area - Building #13
17	Collector Point Hazardous Waste - Building #13
18	Loading/Unnloading Dock South of Building #11
19	Area Near Monitoring Well MW-1
	Old facility sewers prior to 1972
20	Outfalls 1 and 2 to Van Cleef Lake
21	Outfalls 3, 4, 4A, 5A, 5B, 6, and 7 to the Barge Canal
22	Outfall 8 to ditch north of plant
	Sumps and Drains Identified by NYSDEC
23	Floor Drain Room 7A (Building 13A)
24	Sump Room 6A (Building 13)
25	Waste Collection Pits in Room 4A (Building 13)
26	Floor Drains in Former Degreaser Area and TCE Fill Pipe (Building 11)
27	Sumps and Drains in Lead Treatment Room (Building 7A)
28	Trench and Sump (Building 9A)
29	Outside Lift Station No. 1 Sump
	Other Areas
30	PCB Capacitor Storage Area
31	Open Burning Area
	Building Sumps, Pits, Overhead and Underfloor Process Lines
32	Pit and Trench Drain in HF Acid Make-up, South of Room #4 (Building #13)
33	Sumps and Pits (locations throughout Buildings 6-13 not shown)
34	Overhead Wastewater Transfer Lines to WTP
35	Underground Wastewater Sewer Lines to WTP
	Hazardous Waste Management Units
36	Filter Cake Dump Pit
37	Wastewater Effluent Holding Lagoon
38	Organic Waste Incinerator
	Incinerator Feed Storage Tanks (2 - 5,000 gal.)
39	UST 003 - Incinerator Feed Storage Tanks
40	UST 004 - Incinerator Feed Storage Tanks
	Industrial Wastewater Treatment Plant
41	Industrial Wastewater Treatment Plant
42	Six Inch Effluent Line Investigative Area

SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

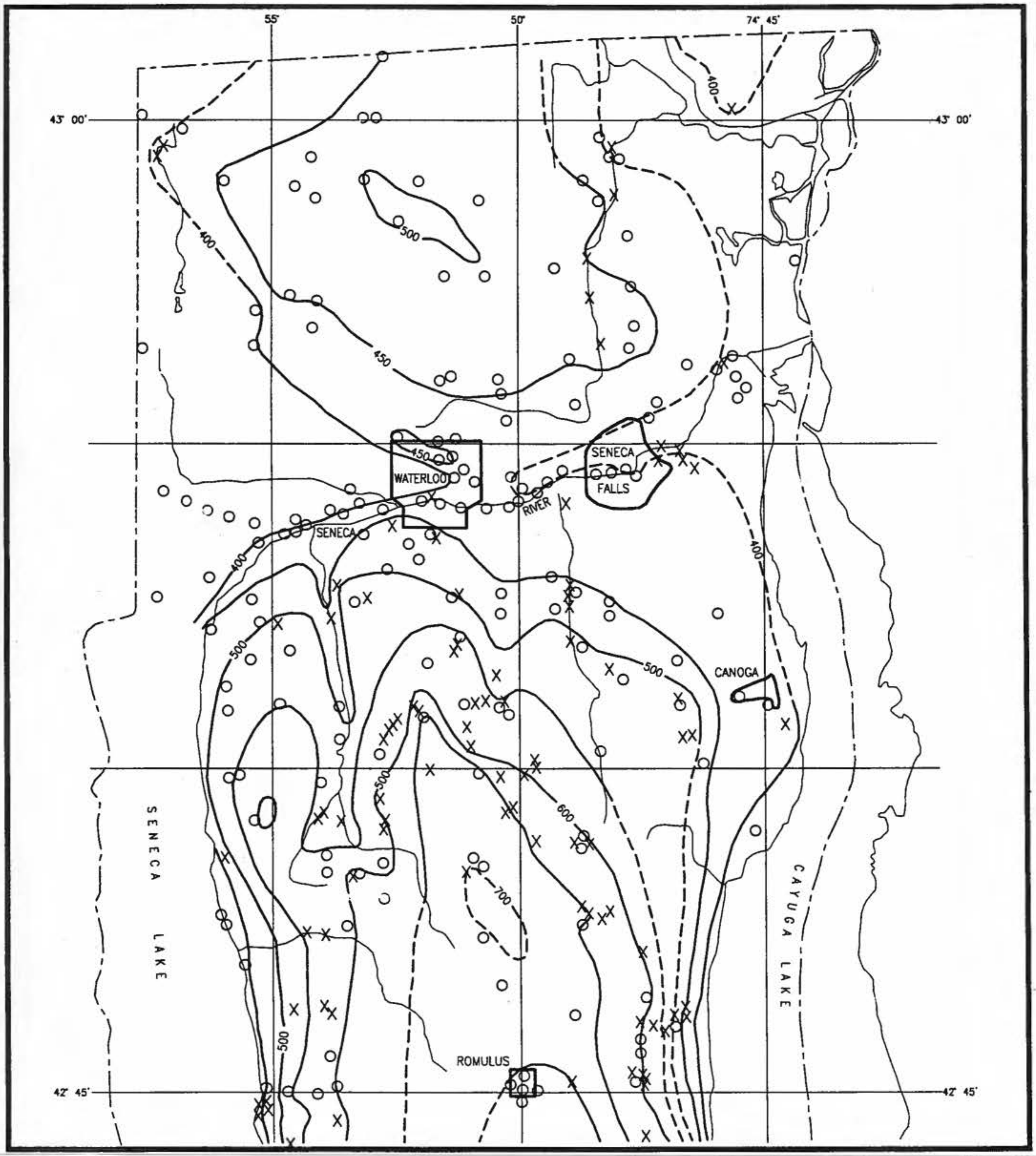
GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 3
FORMER SOLID WASTE MANAGEMENT UNITS

DATE:	MAY 16, 2002
JOB NO.:	27010-040-007
DRAWN BY: MAR	CHK'D BY: GA
SCALE:	AS SHOWN

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115



SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 2-1
Drawing Dated: November 2001

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 4
BEDROCK ELEVATION CONTOURS NEAR SENECA FALLS

DATE: MAY 16, 2002	URS
JOB NO.: 27010-040-007	
DRAWN BY: MAR / CHK'D BY: SB	
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008
PHONE: 847.228.0707
FAX: 847.228.1115

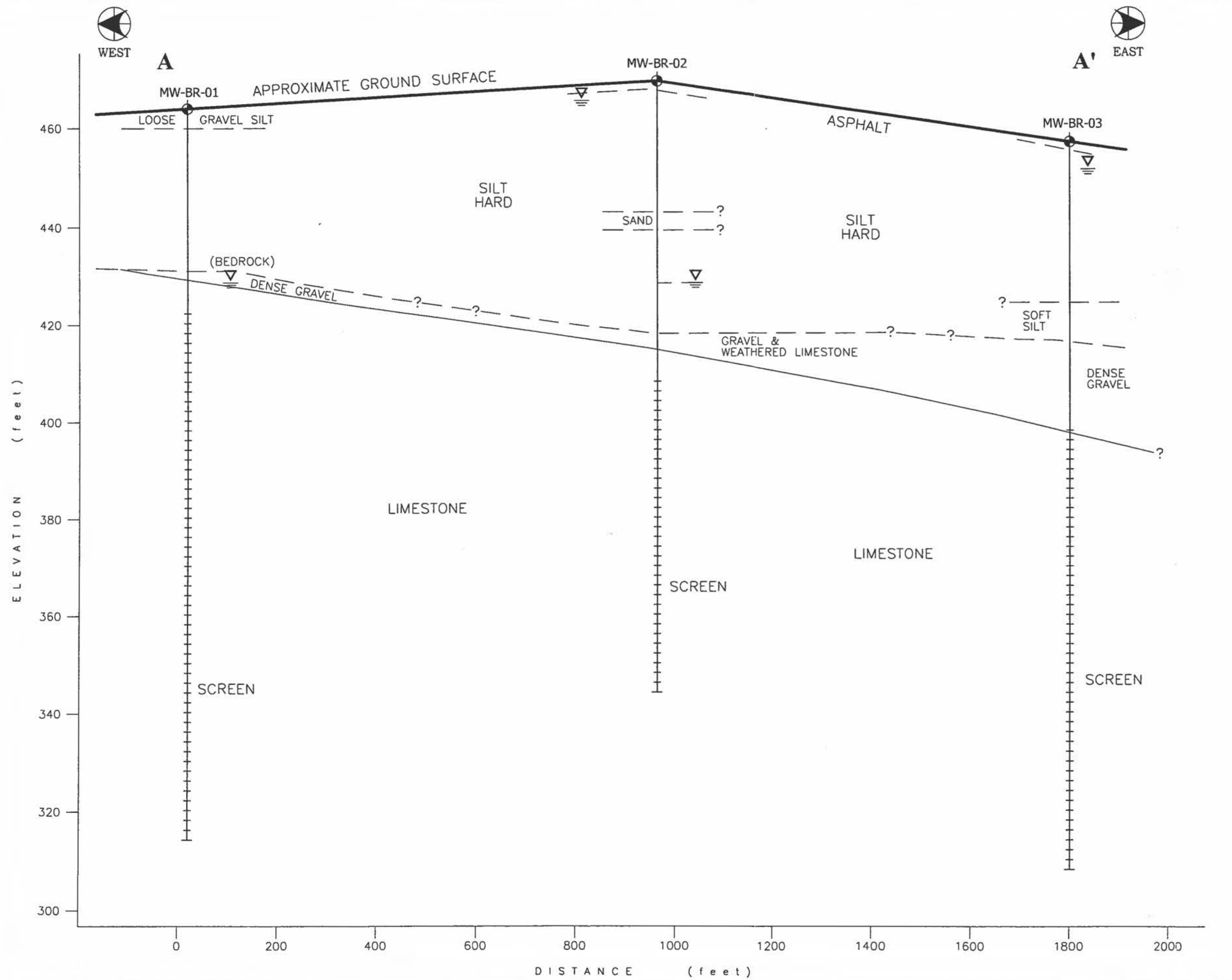
SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 5
GEOLOGIC CROSS SECTION REFERENCE MAP

DATE: MAY 16, 2002		
JOB NO.: 27010-040-007		
DRAWN BY: MAR	CHK'D BY: SB	
SCALE: AS SHOWN		

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

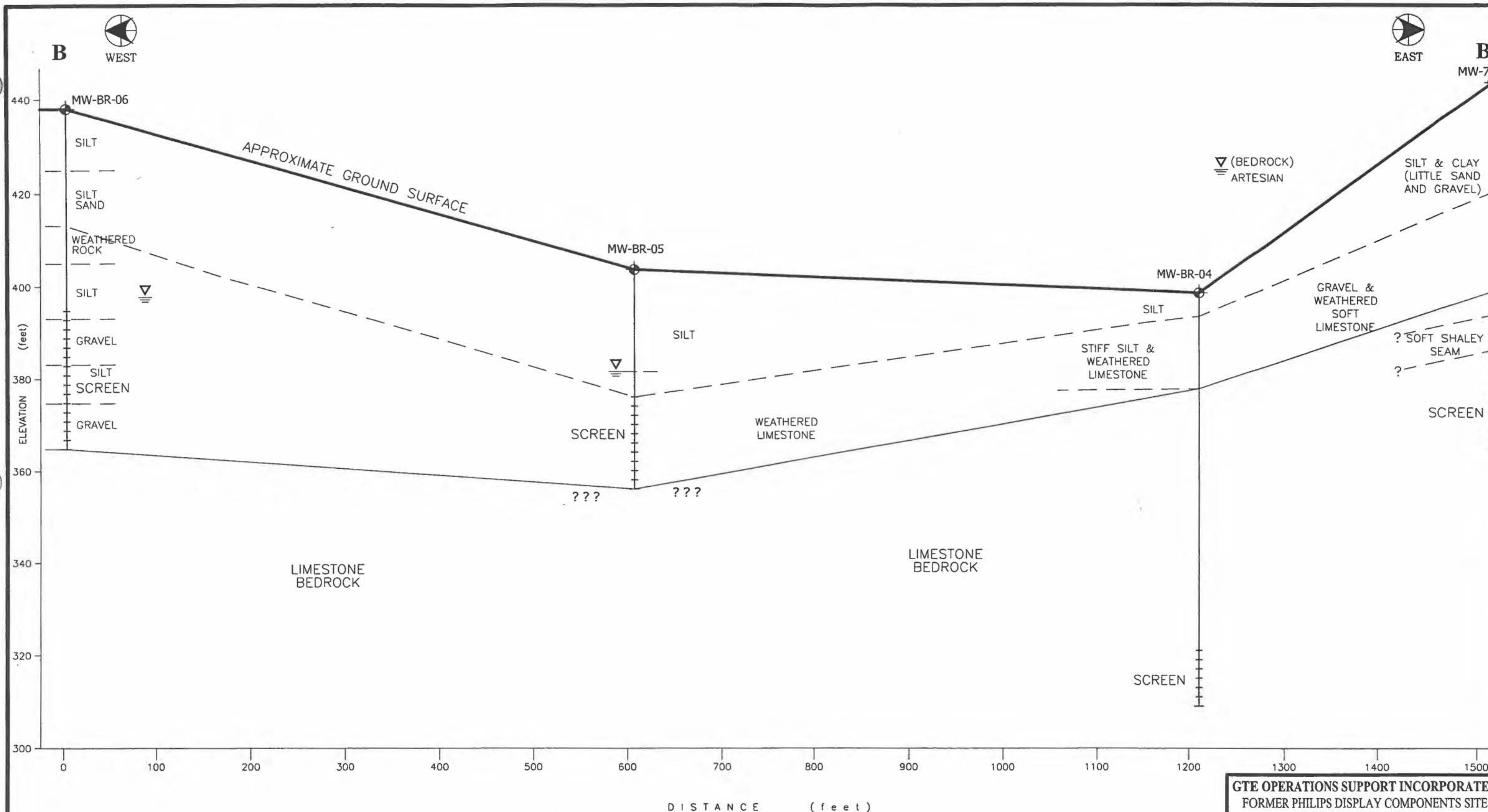


GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 5A
GEOLOGIC CROSS-SECTION A-A'

DATE: JULY 1, 2002	URS
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: PMC
SCALE: AS SHOWN	

1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE 847.228.0707
FAX: 847.228.1115

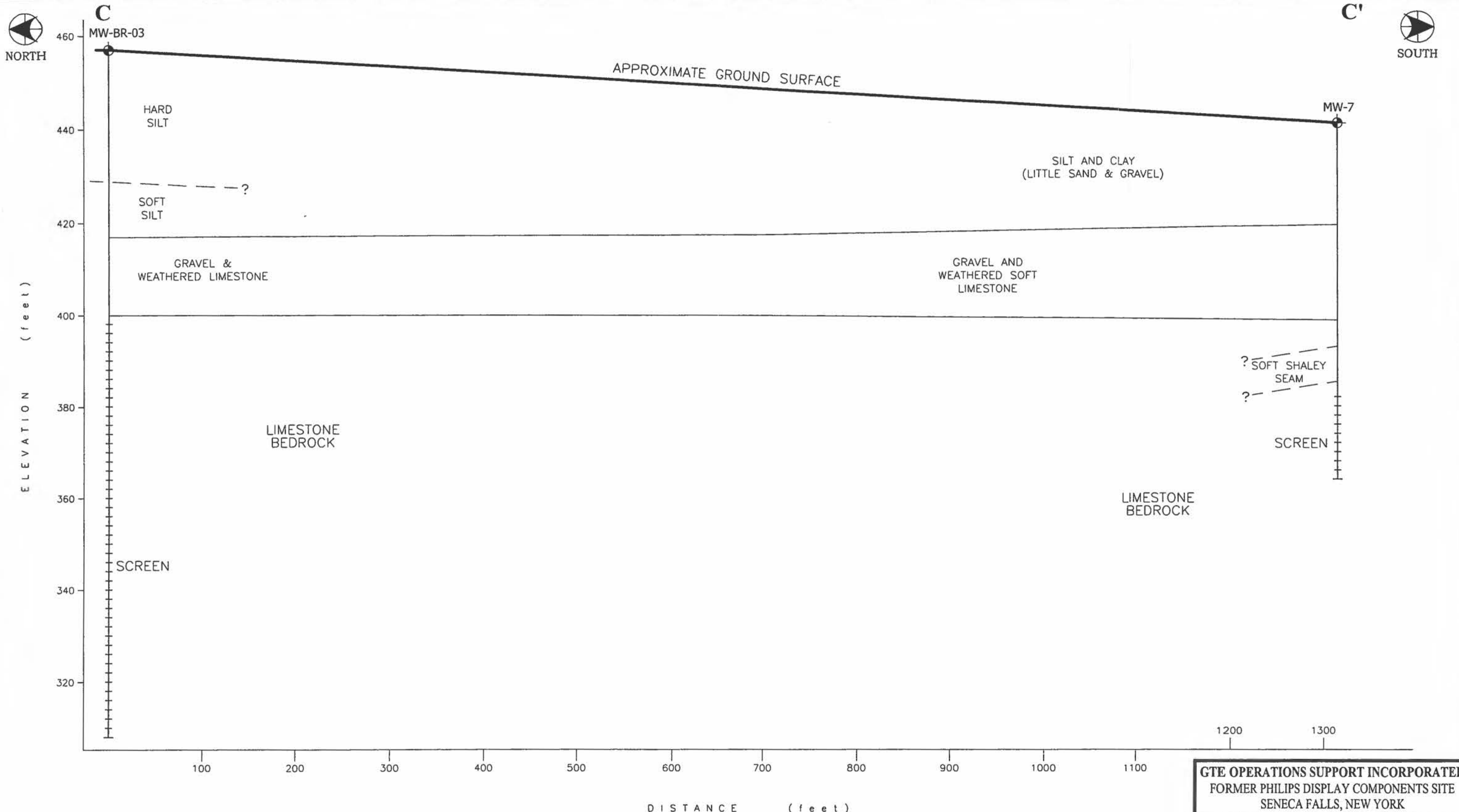


GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 5B
GEOLOGIC CROSS-SECTION B-B'

DATE: JULY 1, 2002
JOB NO.: 27010-040-007
DRAWN BY: MAR
CHK'D BY: PMC
SCALE: AS SHOWN

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

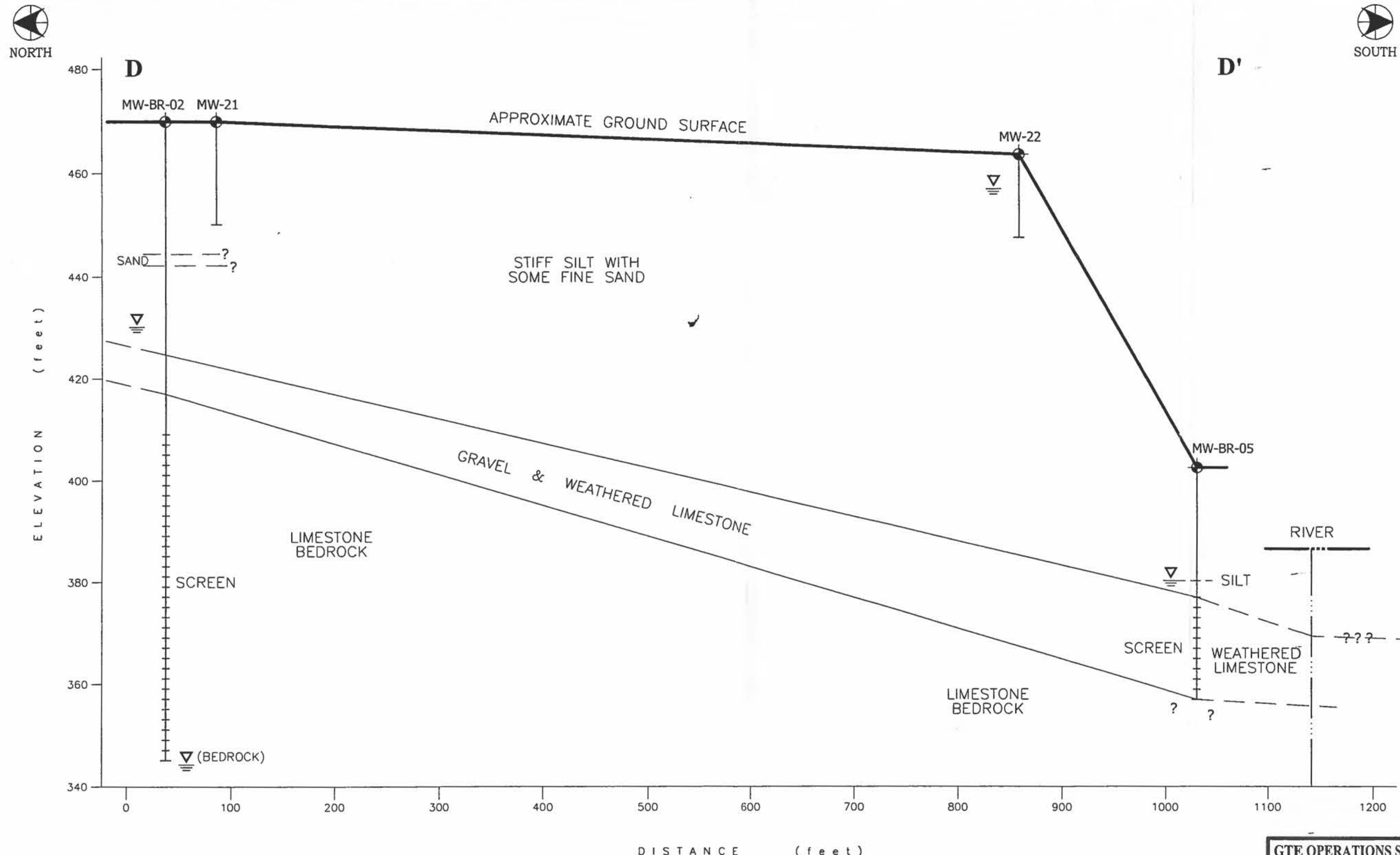


GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 5C
GEOLOGIC CROSS-SECTION C-C'

DATE: JULY 1, 2002
JOB NO.: 27010-040-007
DRAWN BY: MAR
CHK'D BY: PMC
SCALE: AS SHOWN

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

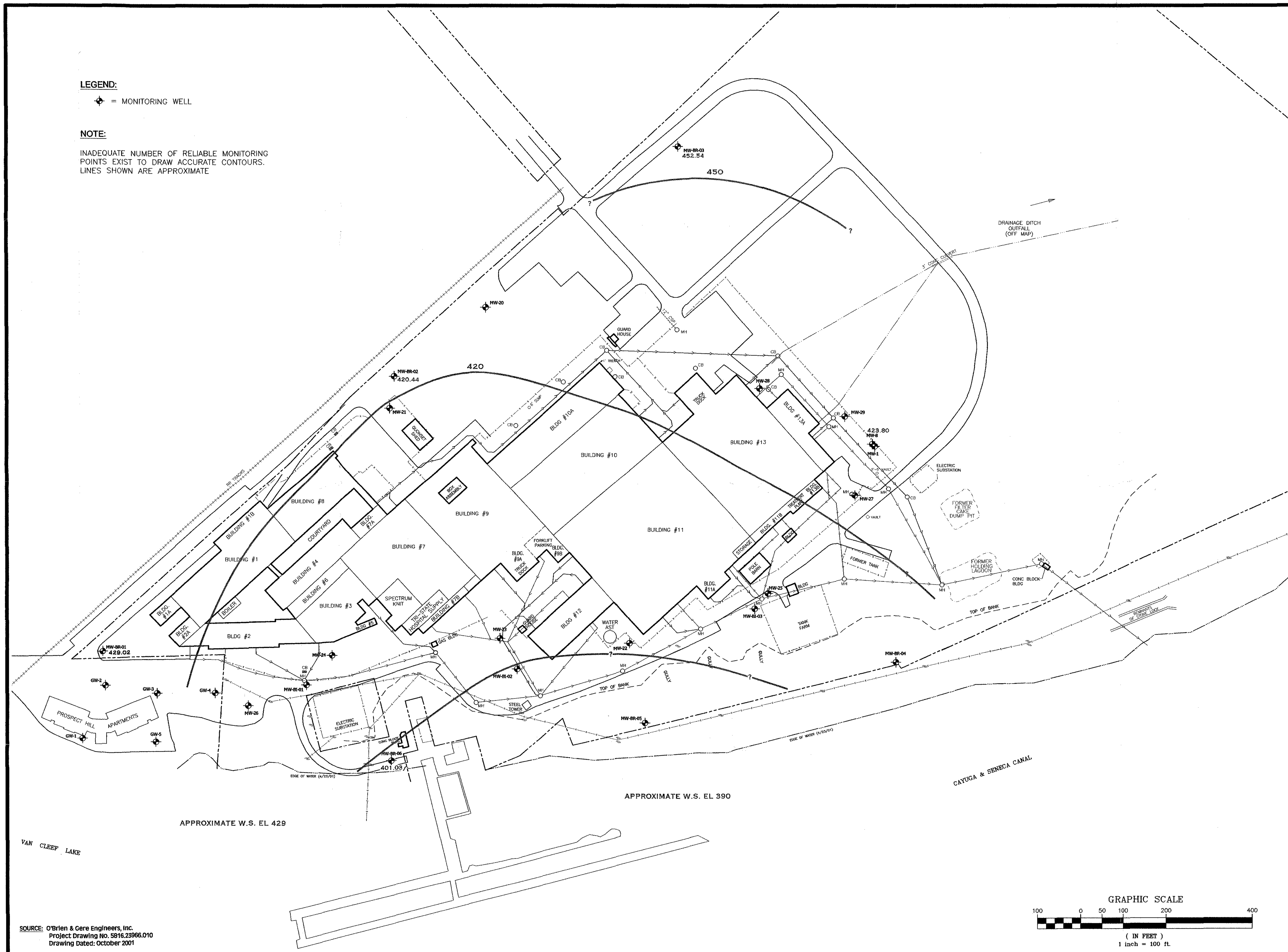


GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 5D
GEOLOGIC CROSS-SECTION D-D'

DATE: JULY 1, 2002	
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: PMC
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115



GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 7
BEDROCK GROUNDWATER ELEVATION CONTOURS

DATE: MAY 16, 2002	
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: PC
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

LEGEND:

- ——·—— = PROPERTY LINE
- ⊕ = MONITORING WELL
- NS = MONITORING WELL 29 WAS NOT SAMPLED IN MARCH 2001

ACTION LEVELS PROVIDED BY NYSDEC IN "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS." MEMORANDUM DATED JUNE 1998.

DATA ARE REPRESENTED FOR ALL ROUNDS OF SAMPLING FOR EACH PARAMETER THAT HAD DETECTED CONCENTRATIONS EXCEEDING ACTION LEVELS FOR AT LEAST A SINGLE ROUND OF SAMPLING.
FOR THE PARAMETERS WITH DATA BELOW ACTION LEVELS FOR A SAMPLING ROUND(S), CONCENTRATIONS ARE PRESENTED IN FINE PRINT.
CONCENTRATIONS BELOW ANALYTICAL QUANTITATION LIMITS ARE PRESENTED AS ESTIMATED (J).
CONCENTRATIONS THAT EXCEEDED ANALYTICAL CALIBRATION RANGE QUALIFIED WITH "E".
IF CONCENTRATIONS OF ALL PARAMETERS HAVE REMAINED BELOW ACTION LEVELS, THEN ONLY THE SAMPLING FREQUENCY IS SHOWN.

SOURCES: 1993 DATA COLLECTED BY CHESTER ENVIRONMENTAL INC. 1999, 2000, & 2001 DATA COLLECTED BY O'BRIEN & GERE ENGINEERS, INC. AND ANALYZED BY O'BRIEN & GERE LABORATORIES, INC. 2002 DATA COLLECTED BY URS CORPORATION AND ANALYZED BY STL LABAROTORIES. DATA FOR WELLS GW-1 THROUGH GW-5 COLLECTED BY URS-ALBANY AND ANALYZED BY CON-TEST ANAYTICAL LABORATORY.
BASE MAP PROVICED BY RYBINSKI SURVEYING.

UNITS = ug/L

Semi Annual Sampling

MW-20 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
cis-1,2-Dichloroethene	27	23	7.2	12	5.5	4.4	6.0	12	7.0	11	5J	5
Vinyl Chloride	120	43	21	35	8.0	14	21	37	25	39	19	2
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	0.62	--	0.83	1J	5

Semi Annual Sampling

MW-24 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-01	Mar-01	Sept-01	Mar-02	Action Level
1,2-Dichloropropane	10	--	--	--	--	--	--	--	--	--	--	5
1,1-Dichloroethene	100	--	66	68	65E	65J	--	--	62	71J	--	5
Xylene (total)	110		39	37J	36	--	--	--	15	--	--	5
Trichloroethene	11,000	13,000	3,200	5,200	2,000	3,800	4,500	4800	3700	630	2200	5
1,2-Dichloroethane	1,300J	1,200J	680	630	290J	810	660	480J	800	820J	500J	0.6
Toluene	140	--	48	37J	48E	--	--	--	44	63J	--	5
trans-1,2-Dichloroethene	150	--	130	120	120E	130J	--	--	120	130	110	5
Benzene	26	--	20	14J	17	--	--	--	18	--	--	0.7
cis-1,2-Dichloroethene	38,000	38,000	28,000	29,000	14,000	34,000	26,000	30,000	31000	44,000	28,000	5
Ethylbenzene	59	--	32	13J	24	--	--	--	15	--	--	5
Vinyl chloride	8,800	5,000	2,100	2,100	940J	1,800	1,800	2100	1600	2100	1600	2

Semi Annual Sampling

MW-26 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
Trichloroethene	310	450	58	230	190	160	190	210E	62	130	170	5
1,2-Dichloroethane	--	--	--	1.1	0.73	--	--	1.1	1.3	1.6J	--	0.6
cis-1,2-Dichloroethene	180	180	270	280	270	280	360	410E	190	270	310	5
Vinyl chloride	19	12	12	17	15	17	20	--	27	2.9	16	2
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	3	11	1.1	--	5

Semi Annual Sampling

MW-28 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
Trichloroethene	11	11	7.8	23	12	8.9	13	23	14	14	9	5
Methylene chloride	--	--	--	--	--	--	--	5.2	--	--	--	2
Chloroform	--	--	--	--	--	--	--	0.22J	--	0.16J	--	7
1,1,1-Trichloroethane	--	--	--	--	--	--	--	1.6	--	0.63	0.6J	5

Semi Annual Sampling

MW-29 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
Toluene	250	--	190	19	65	350	340	150	NS	7.4	9H	5
Benzene	6J	--	3.9	3.7	3.6	3.4	3.6	3.3J	NS	4.7	--	0.7
cis-1,2-Dichloroethene	64	69	18	15	21	22	20	19	NS	11	9	5
Vinyl chloride	51	31	14	12	--	14	13	8.1J	NS	4.2	3J	2
1,1-Dichloroethane	--	--	--	--	--	--	--	1.2J	NS	1.4	1J	5

No Longer Sampled

MW-8 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Action Level
1,1,1-Trichloroethane	22	--	3.8	0.43J	1.1	0.64	3.5	5

Semi Annual Sampling

MW-1 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
1,1,1-Trichloroethane	57	80	5.8	21	12	14	13	19	18	9.1	3J	5
1,1-Dichloroethane	7J	10J	3	4.8	2.6	3.1	2.7	5.2	--	4.5	0.8J	5
1,1-Dichloroethene	--	--	--	--	--	--	--	1.7	--	--	--	5
1,2-Dichloroethane	--	--	--	--	--	--	--	1.7	--	--	--	0.6

Well Sampled By Others

GW-3 — Monitoring Data

Parameter	July-00	Action Level
cis-1,2-Dichloroethene	3.9	5
Vinyl chloride	2.1	2

Semi Annual Sampling

MW-25 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
1,1,1-Trichloroethane	34	45J	14	23	15	16	18	24J	21	6.8J	7J	5
1,1-Dichloroethane	44	49J	31	41	39	32	34	38	36	30	23J	5
1,1-Dichloroethene	17	--	7.2	17	14	10J	1J	--	12	4.8J	5J	5
Trichloroethene	120	170	37	88	72J	57	64	60	57	36	26	5
Toluene	6J	--	--	0.89	0.47J	--	--	--	--	--	--	5
trans-1,2-Dichloroethene	6J	--	15	4.8	5.1	5.0J	4.5J	--	--	--	2J	5
Benzene	3J	--	0.32J	0.7	0.51	--	--	--	--	--	--	0.7
cis-1,2-Dichloroethene	2,000	2,100	800	1200	850	930	970	1300	840	690	490	5
Vinyl chloride	590	300	150	270	210	230	140	190	240	21J	21J	2
Methylene chloride	--	--	--	--	--	--	--	--	5.3	--	1J	5

Semi Annual Sampling

MW-BI-03 — Monitoring Data

Parameter	July-01	Sept-01	Mar-02	Action Level
Trichloroethene	DRY	DRY	29 *	5

* Purge water sample-well went dry

Well Sampled By Others

GW-4 — Monitoring Data

Parameter	July-00	Action Level
1,1-Dichloroethene	2.5	5
cis-1,2-Dichloroethene	9.4	5
Trichloroethene	2410	5

Semi Annual Sampling

MW-BI-06 — Monitoring Data

Parameter	July-01	Sept-01	Mar-02	Action Level
Trichloroethene	48	27	10	5

Semi Annual Sampling

MW-BR-02 — Monitoring Data

Parameter	July-01	Sept-01	Mar-02	Action Level
Trichloroethene	DRY	DRY	7 *	5

* Purge water sample-well went dry

Semi Annual Sampling

MW-22 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
Trichloroethene	43	43	23	30	22	17	19	27	18	20	12	5
cis-1,2-Dichloroethene	17	16	21	25	20	11	10	21	8.7	17	11	5
Vinyl Chloride	--	--	2.7	2.9	2.4	0.95J	0.61J	1.4	--	1.6	1J	2

Semi Annual Sampling

MW-23 — Monitoring Data

Parameter	Jun-93	Jul-93	Jun-99	Sept-99	Dec-99	Mar-00	Jun-00	Nov-00	Mar-01	Sept-01	Mar-02	Action Level
Trichloroethene	17,000	23,000	7500	19,000	11,000	10,000	14,000	12,000E	8800	4600	4500	5
1,2-Dichloroethane	64	--	38	110	26	36J	10J	67	39	--	--	0.6
cis-1,2-Dichloroethene	35	--	260	530	1,800	260	300	430	280	250	210J	5
Vinyl Chloride	--	--	5.3	32J	7.5	--	--	18J	--	--	--	2
Methylene Chloride	--	--	0.13J	--	--	17J	--	--	--	6.7J	14J	2
Chloroform	--	--	--	--	--	--	--	--	7.4	5.6J	--	7

SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 8
GROUND WATER MONITORING PROGRAM RESULTS SUMMARY

DATE:	MAY 16, 2002
JOB NO.:	27010-040-007
DRAWN BY: MAR	CHK'D BY: SB
SCALE:	AS SHOWN

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

LEGEND:

- ——·—— = PROPERTY LINE
- ▲ = SOIL BORING SAMPLE
- = TEMPORARY MONITORING WELL/SOIL BORING SAMPLE
- = SURFACE SOIL SAMPLE
- = PERMANENT MONITORING WELL/SOIL BORING SAMPLE

SAMPLE LOCATION ID — CONSTITUENT — CONCENTRATION IN (ug/Kg) organics (mg/Kg) metals

B7-SBS-04		
12-14	1,2-Dichloroethane	260

END DEPTH OF SAMPLE IN FEET

BEGINING DEPTH OF SAMPLE IN FEET

LAB_CHEM	TAGM or SITE-SPECIFIC BACKGROUND	REGIONAL BACKGROUND	UNITS
Arsenic	7.5	12	mg/Kg
Cadmium	1	1	mg/Kg
Chromium	10	40	mg/Kg
Copper	25	50	mg/Kg
Mercury	0.1	0.2	mg/Kg
Nickel	13	25	mg/Kg
Zinc	116	50	mg/Kg
Benzo(a)anthracene	224	NA	ug/Kg
Benzo(b)fluoranthene	1100	NA	ug/Kg
Benzo[a]pyrene	61	NA	ug/Kg
Chrysene	400	NA	ug/Kg
Dibenzo(a,h)anthracene	14	NA	ug/Kg
1,1,2,2-Tetrachloroethane	600	NA	ug/Kg
1,2-Dichloroethane	100	NA	ug/Kg
Acetone	200	NA	ug/Kg
Benzene	60	NA	ug/Kg
Toluene	1500	NA	ug/Kg
Trichloroethene	700	NA	ug/Kg
Vinyl Chloride	200	NA	ug/Kg
Xylene (total)	1200	NA	ug/Kg

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 9
CONSTITUENTS DETECTED IN SOIL EXCEEDING TAGMs AND BACKGROUND

DATE: MAY 16, 2002
JOB NO.: 27010-040-007
DRAWN BY: MAR
CHK'D BY: SB
SCALE: AS SHOWN

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

B2-GW-11 (legend example)

–	Trichloroethene	8

LAB_CHEM	CLASSGA	UNITS
Cadmium, filtered	0.005	mg/L
Iron, filtered	0.3	mg/L
Manganese	0.3	mg/L
Magnesium	35	mg/L
Sodium, filtered	20	mg/L
1,1,1-Trichloroethane	5	ug/L
1,1-Dichloroethane	5	ug/L
1,2-Dichloroethane	0.6	ug/L
Acetone	50	ug/L
Benzene	1	ug/L
Chloroform	7	ug/L
Ethylbenzene	5	ug/L
Toluene	5	ug/L
Trichloroethene	5	ug/L
Vinyl chloride	2	ug/L
Xylene (total)	5	ug/L
cis-1,2-Dichloroethene	5	ug/L
trans-1,2-Dichloroethene	5	ug/L

B9A-GW-04

–	Magensium	143
–	Sodium	153
–	Iron, Filtered	0.502
–	Trichloroethene	480
–	Vinyl chloride	210
–	cis-1,2-Dichloroethene	770
–	trans-1,2-Dichloroethene	15

B7-GW-03

–	Magnesium	39.6
–	Sodium	90.9
–	1,2-Dichloroethane	9
–	Benzene	1200
–	Ethylbenzene	560
–	Toluene	52
–	Xylene (total)	1300

B9A-GW-05

–	Iron, filtered	15.5
–	Manganese, filtered	0.527
–	Sodium	35.3
–	Trichloroethene	17
–	cis-1,2-Dichloroethene	19

B2-GW-08

–	Magnesium	47
–	Manganese, filtered	0.348
–	Sodium	66.1
–	1,2-Dichloroethane	140
–	Toluene	40 J
–	Trichloroethene	2400
–	Vinyl chloride	410
–	cis-1,2-Dichloroethene	4800

IS-GW-02

–	Manganese, filtered	0.457
–	Sodium	35.2
–	1,2-Dichloroethane	2 J
–	Trichloroethene	13
–	Vinyl chloride	15
–	cis-1,2-Dichloroethene	63

B9-GW-03

–	cis-1,2-Dichloroethene	20

MW20-GW-02

–	Vinyl chloride	11
–	cis-1,2-Dichloroethene	27

B2-GW-07

–	1,2-Dichloroethane	1
–	Vinyl chloride	53
–	cis-1,2-Dichloroethene	10

B2-GW-10

–	1,2-Dichloroethane	18
–	Trichloroethene	650
–	Vinyl chloride	81
–	cis-1,2-Dichloroethene	330

FOT-GW-03

–	Ethylbenzene	6

FOT-GW-04

–	Benzene	3

B2-GW-06

–	1,2-Dichloroethane	9900
–	Toluene	3200 J
–	Trichloroethene	230000
–	Vinyl chloride	3600 J
–	cis-1,2-Dichloroethene	100000

B11-GW-02

–	Cadmium, filtered	0.0210
–	Manganese, filtered	0.341
–	1,1,1-Trichloroethane	120
–	Acetone	1100
–	Toluene	390
–	Trichloroethene	12000
–	cis-1,2-Dichloroethene	530

B2-GW-05

–	Magnesium	61.9
–	Sodium	22.7
–	1,2-Dichloroethane	880 J
–	Toluene	500 J
–	Trichloroethene	45000
–	cis-1,2-Dichloroethene	10000

B9-GW-05

–	cis-1,2-Dichloroethene	12

B2-GW-04

–	Iron, filtered	1.71
–	Magnesium	44.6
–	Manganese, filtered	0.944
–	Sodium	22.8
–	1,2-Dichloroethane	9 J
–	Trichloroethene	370
–	Vinyl chloride	85
–	cis-1,2-Dichloroethene	710

B9-GW-04

–	1,2-Dichloroethane	1

B11-GW-01

–	Iron, filtered	0.305
–	Manganese, filtered	1.02
–	1,1-Dichloroethane	6

B2-GW-03

–	Iron, filtered	1.42
–	Manganese, filtered	0.845
–	Trichloroethene	1100
–	Vinyl chloride	44 J
–	cis-1,2-Dichloroethene	440

B11-GW-10

–	1,1,1-Trichloroethane	36
–	1,1-Dichloroethane	31
–	Trichloroethene	570
–	Vinyl chloride	12 J
–	cis-1,2-Dichloroethene	440

CY-GW-02

–	Trichloroethene	15
–	Xylene (total)	7

CY-GW-04

–	Trichloroethene	19

B2-GW-01

–	Trichloroethene	3200
–	Vinyl chloride	140
–	cis-1,2-Dichloroethene	1000

B2A-GW-03

–	Trichloroethene	6
–	Vinyl chloride	3
–	cis-1,2-Dichloroethene	13

B2A-GW-02

–	Trichloroethene	790

OB-DGW-03

–	Magnesium	44.5
–	Trichloroethene	53
–	Vinyl chloride	84
–	cis-1,2-Dichloroethene	390

OB-DGW-04

–	Trichloroethene	10

OB-SGW-02

–	Trichloroethene	40
–	Vinyl chloride	190
–	cis-1,2-Dichloroethene	820

B11-GW-04

–	Iron, filtered	2.82
–	Magnesium	53.3
–	Manganese, filtered	0.690
–	Sodium	47.7
–	Trichloroethene	3500
–	cis-1,2-Dichloroethene	1600

B2A-GW-04

–	1,2-Dichloroethane	1 J
–	Trichloroethene	98
–	Vinyl chloride	3 J
–	cis-1,2-Dichloroethene	150

OB-DGW-01

–	Magnesium	68.9
–	Trichloroethene	2400
–	cis-1,2-Dichloroethene	44

OB-SGW-03

–	Cadmium, filtered	0.0480
–	Iron, filtered	0.337
–	Manganese, filtered	0.566
–	Trichloroethene	85
–	Vinyl chloride	18
–	cis-1,2-Dichloroethene	200

IS-GW-03

–	Iron, filtered	0.386
–	Manganese, filtered	0.521
–	1,2-Dichloroethane	1 J
–	Trichloroethene	8
–	Vinyl chloride	23
–	cis-1,2-Dichloroethene	99

B2-GW-02

–	Sodium	31.1
–	1,2-Dichloroethane	23 J
–	Trichloroethene	2300
–	Vinyl chloride	15 J
–	cis-1,2-Dichloroethene	430

B7-GW-05

–	Magnesium	74.5
–	Sodium	72
–	Xylene	8

IS-GW-06

–	1,2-Dichloroethane	4

B7-GW-01

–	Iron, filtered	4.01
–	Sodium	46.2
–	1,2-Dichloroethane	8
–	Trichloroethene	170

B11-GW-09

–	Chloroform	240 J
–	Trichloroethene	230000
–	cis-1,2-Dichloroethene	3200

B2-GW-09

–	1,2-Dichloroethane	58
–	Trichloroethene	1200
–	Vinyl chloride	66
–	cis-1,2-Dichloroethene	520

OB-DGW-02

–	Iron, filtered	0.770
–	Magnesium	41
–	1,2-Dichloroethane	99
–	Trichloroethene	30
–	Vinyl chloride	45
–	cis-1,2-Dichloroethene	140

IS-GW-01

–	Magnesium	48.8
–	Sodium	50
–	1,2-Dichloroethane	2
–	Trichloroethene	17
–	cis-1,2-Dichloroethene	16

B11-GW-03

–	Trichloroethene	870
–	Vinyl chloride	14 J
–	cis-1,2-Dichloroethene	84

OB-SGW-04

–	1,2-Dichloroethane	190
–	Trichloroethene	260
–	Vinyl chloride	220
–	cis-1,2-Dichloroethene	1400

B2-GW-11

–	Trichloroethene	8

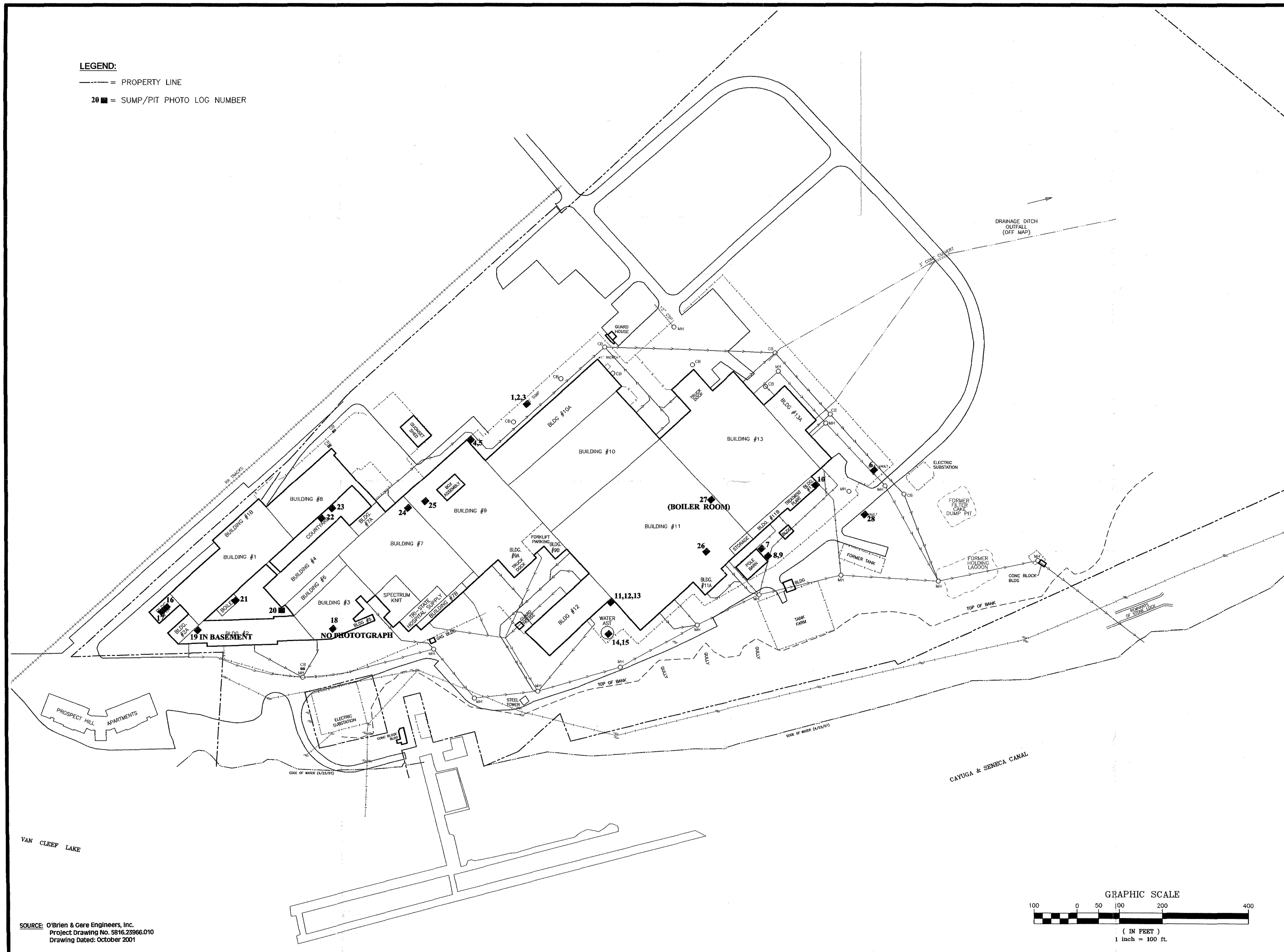
SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 10
CONSTITUENTS DETECTED IN GROUNDWATER EXCEEDING CLASS GA GROUND WATER STANDARDS

DATE: MAY 16, 2002	
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: SB
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115



SOURCE: O'Brien & Gere Engineers, Inc.
Project Drawing No. 5816.23966.010
Drawing Dated: October 2001

GTE OPERATIONS SUPPORT INCORPORATED
FORMER PHILIPS DISPLAY COMPONENTS SITE
SENECA FALLS, NEW YORK

FIGURE 11
SUMP AND PIT SURVEY RESULTS

DATE: MAY 16, 2002	
JOB NO.: 27010-040-007	
DRAWN BY: MAR	CHK'D BY: SB
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
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Attachment 1
Former Phillips Display Components Facility
Seneca Falls, New York
OBG Site Characterization Methods

1.0 Work Plans

The investigation activities carried out by O'Brien & Gere Engineers, Inc. (OBG) during the RFI were detailed in the following work plan documents:

- *RCRA Facility Investigation Work Plan* (SECOR 1996);
- *RFI Work Plan for the Former Philips Display Components Site Seneca Falls, New York Addendum No. 1* (OBG September 29, 2000);
- *RFI Work Plan for the Former Philips Display Components Site Seneca Falls, New York Addendum No. 2* (Bedrock Interface Wells) (OBG 2001a);
- *RFI Work Plan for the Former Philips Display Components Site Seneca Falls, New York Addendum No. 3* (Bedrock Ground Water Wells, Effluent Sample, and Sump Survey), (O'Brien & Gere 2001b); and
- Letter Re: Addendum #3 Indoor Air Sampling from Alvin Ludwig (GTEOSI) to Steve Malsam (New York State Department of Environmental Conservation (NYSDEC)) dated July 18, 2001.

The SECOR International, Inc. (SECOR) Work Plan (1996) provided the initial framework for the investigation. The plan, approved by New York State Department of Environmental Conservation (NYSDEC), was designed to investigate 10 areas of the Site based on their past use. These areas do not necessarily correspond to the Solid Waste Management Units (SWMUs) originally identified in the RCRA Facility Assessment (RFA) process. The investigative areas were numbered sequentially to correspond to nearby building additions or features such as the Courtyard. The following are the 10 initial investigative areas:

- Court Yard Area;
- Building 9 Area;
- Fuel Oil Tank Area;
- Six-inch Effluent Line;
- Building 11 Area;
- Building 7 Area;
- Building 2 Area;
- Historic Outfalls;
- MW-20 Area; and
- Building 13 Truck Dock Area.

Prior to the implementation of the SECOR Work Plan (1996), OBG prepared a Work Plan addendum expanding the scope of the investigation (OBG 2000). NYSDEC approved the Work Plan Addendum in October 2000. Following completion of the proposed scope of work, OBG prepared work plan Addendum No. 2 (OBG 2001a). Addendum No. 2 was developed in collaboration with NYSDEC and issued in January 2001 to install three groundwater monitoring wells at the bedrock interface. Finally, Addendum No. 3 was prepared to install six bedrock monitoring wells and address indoor air questions raised by NYSDEC at an April 2001 meeting between NYSDEC, GTEOSI, and OBG. Addendum No. 3 was issued and approved in May 2001. The following sub-sections briefly describe the components of Addenda No. 1, No. 2 and No. 3. To date, the expanded scope of work has resulted in the investigation of 21 areas.

Addendum 1

Addendum 1 was prepared based on the findings of a Site walk-over conducted by OBG, a preliminary review of previous Site investigation reports, results of a June 1999 ground water sampling event (OBG 1999), and discussions held during a meeting at NYSDEC Regional Offices in Albany, New York. Representatives of NYSDEC, GTEOSI, and OBG attended the meeting. In October 2000, following NYSDEC approval, the SECOR Work Plan (1996) and Addendum No. 1 fieldwork was conducted.

Addendum 2

Although the installation of two bedrock interface (BI) monitoring wells (MWs) was conceptually included in Addendum No. 1, the analytical results of Addendum No. 1 were used to guide the selection of the specific locations of the two wells. A third bedrock interface well location was also selected at this time. Addendum No. 2, therefore, was issued to provide specific locations and to describe the drilling method (SONIC) that would be used to install bedrock interface wells.

The locations of two of the BI MWs were selected in collaboration with NYSDEC in September 2000. These locations are shown on Figure 1-2 of the initial work plan revision, dated September 29, 2000. The third BI MW (which was not scoped in the Addendum 1) was installed near the Pole Barn in an area where volatile organic compounds (VOCs) were previously detected in both soil and ground water. The BI MWs were installed to collect sufficient data to:

- Evaluate whether a confining layer was present on-Site;
- Avoid cross contamination between distinct lithologic zones separated by a definable confining layer;
- Investigate the presence or absence of residual or dissolved solvents at the bedrock interface; and
- If residuals were detected, evaluate the potential for horizontal migration along the overburden bedrock interface.

Addendum 3

Once the SECOR Work Plan, Addendum No. 1, and Addendum No. 2 tasks were completed and the data from these efforts interpreted, Addendum 3 was prepared. Addendum 3 was based primarily on the finding that TCE and its breakdown products were present in the subsurface above New York State (NYS) Technical and Administrative Guidance Manual (TAGM) #4046 guidance levels. Most of the detected constituents were located along the southern portion of the Site. Addendum 3 was designed to further evaluate whether TCE and its breakdown products could have migrated to bedrock or other environmental media. Addendum No. 3 describes the:

- Installation of six bedrock monitoring wells (BR-MW-01 through BR-MW-06);
- The collection of a sample from the interceptor sewer effluent; and
- A survey of the building sumps and pits.

As noted earlier, the Work Plan and its various addenda culminated in a total of 21 investigative areas. In addition to being discussed by matrix type, the investigative findings reported herein are discussed in terms of investigative areas. Areas 11 through 21 include:

- Background evaluation;
- Building 2/2A;
- Building 3 Sump;
- Building 9A;
- Building 13 Fuel Oil Tank;
- Historic Outfalls;
- Grassy Areas Near Buildings;
- Fields East of the Facility Building;
- Interceptor Sewer Bedding;
- Overburden Temporary Wells; and
- Bedrock Interface Monitoring Wells on the Southern Portion of the Site.

1.1 Investigation field activities

This section summarizes the field activities of the RFI. The field activities are further described in the respective RFI work plan documents cited in Section 1. A Quality Assurance Project Plan (QAPP) contained in the RFI work plan addendum was followed during the investigation (OBG 2000). Data validation for the RFI Addendum analytical results (October 2000 field sampling) was conducted by MJW Corporation, under the supervision of OBG. Data validation for the RFI Addendum #3 analytical results (July 2001 field sampling) was conducted by OBG.

1.1.1 Community air monitoring program (CAMP)

A Community Air Monitoring Plan (CAMP) was implemented during the RFI. The CAMP was conducted in accordance with the *New York Department of Health Generic Community Air Monitoring Plan* (NYSDOH 2000). CAMP results are included in Appendix C.

Exposure monitoring was conducted during investigative activities to evaluate if Site workers or the general public were exposed to chemicals during fieldwork and if so, to what extent. On-Site air monitoring included the use of two Mini Rae photoionization detectors (PIDs) and a portable aerosol monitor (DustTrak). Field analytical equipment was calibrated, and tested to see if it was in good working condition immediately prior to each day's use. This calibration ensured that the equipment was functioning within the allowable tolerances that were established by the manufacturer and required by the project.

In accordance with the approved New York State CAMP, ambient and source air samples were collected at the Site during subsurface investigations over the periods of October 16, 2000 through October 27, 2000, January 16, 2001, and January 17, 2001. The upwind and downwind locations of the air monitoring activities were selected by OBG, based on the locations of ground intrusive activities and the anticipated mean wind flow pattern during each sampling event. Wind flow pattern changes were monitored with a hand held wind directional device.

Particulate sampling

A DustTrak Aerosol Monitor (DustTrak) equipped with a cyclone was used to sample ambient air for particulate less than or equal to 10 micrometers (μm) in diameter. The work area and the perimeter of the Site were monitored for particulates using the DustTrak. The DustTrak detects the presence of total or respirable particulates through use of a laser photometer. A pump draws both solid and liquid particles through an optics chamber for measurement purposes.

The DustTrak was factory calibrated according to the procedures outlined in the operation manual. In addition to the factory calibration, prior to each sampling episode the instrument was zeroed using a factory zeroing cassette cartridge. The DustTrak draws ambient air at a constant volumetric flow rate of approximately 1.7 liters per minute. Sample collection was based on 15 minute averaging periods. The particulate data relevant to each sampling period was data logged.

VOC sampling

Monitoring of VOCs was performed in accordance with the New York State CAMP. VOC air sampling was performed with a Mini RAE 2000 (Mini RAE) PID air sampler. The PID was equipped with a 10.7 eV lamp that is capable of detecting over 70 percent of VOCs on the NYSDECs target compound list (TCL). The PID was calibrated in the "Fresh Air" mode prior to and following each sampling episode.

The Mini RAE monitors total concentrations of many hazardous organic and some inorganic gases and vapors capable of ionizing and detecting compounds with an ionization potential of less than 10.7 eV. The main solvent detected at the Site, TCE, has an ionization potential of 9.45 eV. The instrument ionizes molecules using ultraviolet (UV) radiation by producing a current that is proportional to the number of ions present. The instrument was calibrated and recharged daily using a standard calibration gas specified by the manufacturer. Calibration data were recorded in field notebooks and on calibration log sheets. The monitoring data was data-logged at 15 minute intervals.

1.2. Site characterization methods

This section describes the field methods used to characterize the Site including field modifications to the Work Plan. The Work Plan was intended to have sufficient flexibility to respond to field conditions. Field modifications included increasing the number and depths of soil borings to adequately characterize the nature and extent of residuals identified during field screening. NYSDEC concurred with the Work Plan modifications made in the field.

Field activities were performed while attempting to minimize disturbance to on-Site businesses and traffic patterns. The field activities were conducted from October 16 through November 3, 2000 and from January 16 through 19, 2001. Field efforts included:

- Utilities clearance,
- Field record maintenance,
- Soil and water sampling investigation; and
- Decontamination.

The field methods used are described in the following sections.

1.2.1 Utility clearance

On-Site utilities, to the extent possible, were identified for the health and safety of field personnel and to prevent damage to underground utilities during intrusive activities. Prior to initiation of the field activities, sampling locations were designated and marked in concurrence with GTEOSI and NYSDEC. OBG contacted Underground Facilities Protection Organization (UFPO) to locate and mark Site utilities at 50 Johnston Street for each field event. UFPO coordinates the locations of utilities on public property and right-of-ways for those companies subscribing to their service. Therefore, OBG subcontracted Syracuse Utilities of Syracuse, New York to perform a supplemental utility clearance on the private portions of the property. For each field sampling effort, a Syracuse Utilities technician investigated the area around each proposed boring location using an inductive utility-locating instrument.

1.2.2. Field records

Information related to the field investigation was recorded by the Project Coordinator and Field Geologist in field logbooks. The field logbooks were maintained to provide a daily record of significant events, observations, and measurements taken during the field investigation. Chain-of-custody forms were prepared for samples sent to the laboratory for analysis. Field logbooks and copies of chain-of-custody forms are maintained in the project file following completion of the fieldwork.

1.2.3. Soil and water sampling

The objectives of the subsurface soil and ground water screening investigation were to evaluate potential sources, define the vertical and horizontal extent of impacts, and evaluate migration pathways of chlorinated VOCs in both soil and ground water. Screening was used throughout the investigation in the selection of samples for laboratory analysis. A detailed description of the sampling methods is provided in the RFI work plan documents cited in Section 1. The following sections, however, summarize the general screening and sample collection methods for soil and water samples.

Soil investigation
Surface soils in grass and fields, soil/sediment along historic outfalls, sump solids/sediment, and subsurface soils were collected. The following sections present the approach to soil and solids sampling for the Site investigation.

Surface soil and sediment sampling
Surface soils in grassy areas near buildings and in the fields east of the buildings were collected in accordance with NYSDOH protocols described in the Draft Technical Reference - 001 regarding Soil Samples for Characterizing Potential Human Exposures (NYSDOH 50370200/04/14/95). Grab samples were collected from the historic outfalls and from the Building 3 sump.

Subsurface soil boring and continuous soil sampling
The initial RFI field investigation was completed from October 16 through November 3, 2000 in accordance with the approved RFI Work Plan Addendum. The objective of the investigation was to evaluate the nature and extent of process residuals related to former Site use. NYSDEC personnel participated in and concurred with the selection of the original soil boring locations defined in the Work Plan. The Work Plan Addendum (OBG 2000), however, was designed to accommodate additional borings in response to field results. The actual number of sampling locations, therefore, was greater than those listed, since the encountered field conditions or screening results warranted the collection of additional samples to meet overall program objectives. Figure 2 depicts the RFI sample locations.

Cores were obtained using a direct push methodology (Geoprobe®). With the exception of the Courtyard, which were 4-foot cores, Geoprobe® soil samples were collected using 2-foot soil cores within acetate sleeves. The soil cores started from the ground surface at each location, and proceeded to a depth dictated by the area being investigated and the presence or absences of headspace vapor readings. The boring depths were based on Site-specific areas of interest, the conditions encountered in the field, and field screening results. The overall approach was as follows:

Sewers: Areas of potential contamination around the historic outfall sewers or the interceptor sewers were to be probed to approximately 12 feet bgs since this was the anticipated depth to the bottom of sewer bedding. However, initial borings adjacent to sewers revealed that the sewer bedding was not a permeable bedding but native silt and clay soils. Therefore, since Site-related residuals were found at depths greater than 12 feet bgs in some areas, the sewer bedding was subsequently probed to greater depths.

USTs: Locations of suspected subsurface impacts due to petroleum fuels were investigated to at least 8 feet beneath the pavement.

Buildings: Borings placed near other wells or building areas were advanced to approximately 12 to 26 feet bgs.

Refusal was not encountered in most of the borings, however the swelling of the clays made direct push methodologies difficult. Soil boring logs are in Appendix A. Several borings were given multiple designations (for example IS-SBS-5 and 5B) due to refusal or because elevated concentrations of VOC constituents were detected during field screening. A second boring was advanced next to the first to further delineate the vertical extent of residuals.

The samples were collected in 1-inch diameter acetate liners. The quantity of sample recovered was limited. Consequently, the proposed analytical parameters were prioritized based on field screening results and the volume of sample material recovered.

Subsurface soil screening
For health and safety purposes, the acetate liners used inside the steel casings, were scanned immediately upon retrieval for the presence of headspace vapor readings (prior to opening and logging the soil core). Additionally, extensive field screening was performed to evaluate and select the soil interval(s) from the soil core to be sent to the laboratory for analysis.

Each core was screened in the field using a PID and at the discretion of the analyst, an UV light. The PID was used to evaluate the potential presence of VOCs and their general magnitude. Soil samples were collected from intervals where screening suggested the presence of elevated VOCs were present; that were discolored; appeared to contain residuals; or that may be of interest to the analyst. Headspace screening was conducted by placing a representative portion of each soil sample into a glass jar covered with aluminum foil and then allowing it equilibrate within the jar at room temperature for approximately 15 to 20 minutes. Readings were taken over a 20-second timeframe. The highest concentration of VOCs measured was recorded. At least one headspace analysis was conducted per core (acetate liner). UV light readings were used to evaluate the presence of non-aqueous phase liquid (NAPL). PID and UV light screening results were recorded on the Test Boring Log Forms.

Samples were selected for either field gas chromatography (GC) - (Photovac 10S7 or equivalent) analysis and/or laboratory analysis based on the frequency with which VOCs were encountered, the number of cores required to characterize a particular area, if cores exhibited NAPL via UV screening, and the type of materials encountered. In the absence of other factors, the ability to characterize the material encountered and to confirm the Mini Rae 2000 screening of samples formed the primary means of determining whether field GC or laboratory analysis of a sample was warranted. The objective of the GC analysis was to further document the presence and relative concentration of VOCs, minimize the number of samples requiring laboratory analysis and help support field decisions made to evaluate the nature and extent of residuals. Based on the quantity of laboratory samples scheduled to be collected from the Site, use of the field GC was limited. When used, the field GC reported the following analytes: tetrachloroethene (PCE), TCE, trans-1,2-dichloroethene(DCE), cis-1,2-DCE, and benzene, toluene, ethylbenzene, and xylenes (BTEX). The SOP for the field GC method is contained in the RFI Work Plan Addendum - Appendix A (OBG 2000).

If PID screening results did not provide information useful to select a soil sample to evaluate the former process sewers, a sample from the approximate depth of the sewer was retained for analysis using the field GC. In addition, appropriate QA/QC was performed in order to provide data to correlate and confirm the on-Site analyses, provide a set of validatable data for use in assessing risk, and examine the nature and extent of residuals .

Soils were described according to the Unified Soil Classification System (USCS) by an on-Site OBG scientist. Soil descriptions included: soil type, color, percent recovery, moisture content, odor and other observations such as organic content and cohesiveness. A representative portion of each sample was retained for analysis and labeled with: Site name, boring number, sample interval, date, and time of collection.

When more than one discrete subsurface zone within a soil boring exhibited evidence of process residuals, either by visual observation or by field screening, additional soil samples were collected and analyzed by the field GC. The GC screening was performed on portions of the core where PID screening suggested the highest levels of VOCs were present, that were discolored, or may have been of interest to the field scientist.

Each sample was given an identification number or designation. Sample identification was classified by matrix, location, depth (if applicable), sampler name, date, and time. Labels were attached to each sample container. Based on the objectives for the particular investigative area, analyses may have included VOCs, SVOCs metals, and fluoride. Recovery rates often varied due to subsurface conditions from 0 to 100 percent.

Water investigation
Temporary groundwater monitoring wells were set in most soil borings subsequent to soil sample collection. In addition, three bedrock interface monitoring wells and six bedrock ground water wells were installed. Finally, one water sample was collected from a sump/pit in Building 3 and one storm-water effluent sample was collected from the former flow house of the interceptor sewer system.

Temporary well installation
The Geoprobe® rig was used to advance soil borings and place the temporary well points. The wells were placed within the soil borings, if applicable. Steel casing was driven to place several of the wells. The remaining wells were pushed into the borehole upon removal of the sampling equipment. The temporary wells were comprised of a 1-inch PVC well placed in a 2-inch diameter borehole.

Temporary well gauging and sampling. Temporary wells consisted of 1.1-inch diameter, 0.010-inch factory slotted Schedule 80 PVC screen with end cap, threaded flush with a Schedule 40 PVC riser. Following installation, the wells were allowed to sit overnight to allow for water to accumulate in the borehole.

Prior to sampling, the water level and total well depth was measured with a water-level indicator. The samples were collected in a 2-foot long disposable bailer. Because of the slow recharge and sample volumes, inadequate sample volume was often obtained, limiting the suite of parameters for laboratory analysis. Ground water sample collection was prioritized in the following order: VOCs, SVOCs, metals, and fluoride, if applicable, in accordance with the QAPP. Because of high ground water turbidity, inorganic samples were filtered through a 0.45-micron filter. Both filtered and unfiltered metals samples were collected and analyzed. Well sampling logs are contained in Appendix B.

Temporary well abandonment.
The wells were backfilled with bentonite clay to maintain a permanent closure. The New York State recommended ground water monitoring well decommissioning procedures (NYSDEC 1995) were used to ensure that the well does not remain as a vertical hydraulic connection or conduit for groundwater or potential contamination between aquifers or zones and to eliminate physical hazards.

Bedrock interface monitoring wells
A SONIC drilling technique, which is described in the RFI Addendum No. 2 work plan, was used to advance the bedrock interface wells. Cores were advanced and then retrieved for screening in 10-foot increments for borings 30 feet in depth. At depths greater than 30 feet, cores were advanced and retrieved in 5 foot increments in order to identify the presence of confining layers or dense non-aqueous phase liquid (DNAPL) and minimize the potential for cross contamination.

An OBG scientist was on-Site during the drilling and sampling operations to describe each soil sample consistent with the direct-push cores. Based on the results of screening, which was similar to the screening of direct push borings, at least one soil sample from each boring was collected. Samples were evaluated and selected at the discretion of the field personnel and sent to the laboratory for analysis via USEPA Method 8260B. A minimum of one soil sample was collected from each bedrock interface well.

Bedrock interface wells were installed 1 to 2 feet into bedrock. A 5 to 10 foot long well screen was set at the bottom of the borehole. A sand pack was installed around the screen extending at least 2 feet above the screen. A minimum 2-foot bentonite seal was installed at the top of the sand pack to seal off connection to the borehole. The remainder of the borehole was grouted and a protective casing installed.

Bedrock Monitoring Wells

Data were collected from soil borings, temporary ground water wells, and bedrock interface monitoring wells during the October 2000 and January 2001 field investigations. Subsequently, a preliminary review indicated that soil borings, temporary ground water wells, bedrock interface monitoring wells, and an ongoing ground water monitoring program were sufficient to evaluate the overburden ground water and the bedrock interface. However, data did not provide a sufficient basis for evaluating the bedrock ground water. Therefore, six bedrock wells were installed at the Site in April 2001. The objective of the installation of bedrock wells was to evaluate:

- the nature of and flow direction of bedrock ground water near the Site;
- the potential for migration of Site-related residuals to bedrock ground water; and
- the potential for off-Site migration of residuals in bedrock ground water.

The six bedrock monitoring wells were installed near locations that were discussed and agreed to with NYSDEC in April 2001. Well locations were selected to surround the facility and collect information related to bedrock ground water. Figure 2 shows the locations of the wells. Approximate locations of the wells are:

- MW-BR-01 near the offices at the west side of the facility,
- MW-BR-06 south of the electric power substation near Van Cleef Lake,
- MW-BR-05 and MW-BR-04 along the southern property boundary along the Seneca River, and
- MW-BR-02 and MW-BR-03 along roadway areas north and east of the facility.

Building 2/3 Sump Water
Both an unfiltered and field-filtered sump water sample was collected from the Building 3 sump and sent for analysis.

Sewer Effluent
A grab sample of storm-water was collected from the interceptor sewer at the former flow house. Substantial storm water flow was observed in the flow house after a significant rain event. The grab sample was collected several days after the rain event while the storm sewer system was under low-flow conditions.

1.2.4. Decontamination procedures

Equipment used to collect subsurface soil and ground water samples was decontaminated between sampling locations. Decontamination fluids were collected in 55-gallon drums. Surface soil and sediment sampling equipment, such as spoons and trowels, were disposable or were decontaminated using the following procedure:

- scrub with non-phosphate detergent solution;
- potable water rinse;
- distilled water rinse; and
- air dry.

Investigation-derived waste, including soil cuttings, decontamination water, and disposable sampling equipment were segregated and containerized in approved 55 gallon drums and staged on-Site in an area specified by the Site operator. Subsequently, soil cuttings were disposed of at an approved disposal facility. Following submission of ground water sample results and the approval of the Seneca Falls municipal WWTP operator, purge water and decontamination water derived from the field investigation were disposed of via the sanitary sewer system on Johnston Street.

1.2.5. Surveying

A licensed surveyor performed a survey to record sample locations, building corners, fences, manhole driveways, and monitoring well elevations. Prior to fieldwork, each proposed sampling point located in a grassy area was marked with a stake, while surveyor shiners were used to mark locations on asphalt. Borings were advanced and grab samples collected as close as practical to the marked locations. If the proposed sample location was relocated, the marker was also relocated. The locations were surveyed to place the soil sample locations on the Site map. The locations of the remaining Site features were based on historical facility maps.

The published elevation for the inner 4-inch PVC casing at existing monitoring well MW-26 was established as the benchmark for the Site vertical datum. The horizontal system was a local coordinate system. The bearings are related to deed bearings. For consistency, ground elevations are reported to the nearest 0.01-foot. The survey sample locations, primary building features, and key catch basin and manhole locations were digitized and incorporated into the Site map taken from the Work Plan.

1.2.6. Analytical methods

A QAPP, contained in the RFI work plan addendum (OBG 2000) was followed while performing the investigation. Analyses for environmental media sampled in investigative units followed the RFI work plan and related documents. The samples collected and analyses performed are summarized in Section 2 of the report. In concurrence with NYSDEC and according to the QAPP, the following analytical methods were followed.

- TCL VOCs – USEPA Method 8260B
- TCL SVOCs – USEPA Method 8270
- TAL Metals – USEPA Method 6010
- Fluoride – USEPA Method 340.2

Note: Both total and filtered samples were analyzed for TAL metals. Total and several decanted samples were analyzed for fluoride.

1.2.7. Data validation and QA/QC summary

Twenty percent of the data analyzed by the laboratory were validated using USEPA Contract Laboratory Program (CLP) validation procedures and checklist modifications as needed to comply with NYSDEC Analytical Services Protocol (ASP). The validated samples were representative of the full set of data. The validated samples chosen were evenly distributed between undetected, low hits, and high concentrations. Only a limited amount of those data validated required qualification and no data were rejected. The results of the data validation indicate that the data are acceptable and fully usable for all qualitative and quantitative purposes. The data validation reports are presented as Appendix F.

Attachment 2
Former Phillips Display Components Facility
Seneca Falls, New York
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Attachment 3
Former Phillips Display Components Facility
Seneca Falls, new York
Acronym List

AOC	Areas of Concern
ASP	Analytical Services Protocol
bgs	below ground surface
BI	Bedrock Interface
BTEX	benzene, toluene, ethylbenzene, xylene
CAH	chlorinated aliphatic hydrocarbon
CAMP	Community Air Monitoring Program
CLP	Contract Laboratory Program
DCA	Dichloroethane
DCB	Dichlorobenzene
DCE	Dichloroethene
DNAPL	dense non-aqueous phase liquid
ECL	Environmental Conservation Law
EDR	Environmental Data Resources
GA values	New York State Ambient Water Quality Standards and Guidance Values for ground water as a source of drinking water
GC	Gas chromatography
GTEOSI	GTE Operations Support Incorporated
HO	Historic Outfall
HWMU	Hazardous Waste Management Unit
ITO	Interceptor Trench Outfall
IWWTP	Industrial wastewater treatment plant
LDC	Landsmen Development Corporation
μm	Micrometer
MCL	Maximum contaminant level
mg/m^3	Milligrams per cubic meter
msl	mean sea level
MW	monitoring well
NAPL	Non-aqueous phase liquids
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OBG	O'Brien & Gere Engineers
PAH	Polycyclic aromatic hydrocarbon (aka PNA or polynuclear aromatic hydrocarbon)
PCA	Tetrachloroethane
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PET	Potential evapotranspiration
PID	Photoionization detector

ppm	parts per million
PRG	Preliminary remediation goals
PVC	Polyvinyl chloride
QA/QC	Quality assurance and quality control
QAPP	Quality assurance project plan
RCRA	Resource Conservation & Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RQD	Rock quality designation
SOP	Standard Operating Procedures
SPDES	State Pollution Discharge Elimination System
SVOC	Semi-volatile organic compound
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target analyte list
TCA	Trichloroethane
TCE	Trichloroethene
TCL	Target compound list
UFPO	Underground Facilities Protection Organization
ug/L	micrograms per liter
URS	URS Corporation
USCS	Unified Soil Classification System
USGS	United States Geological Survey
USEPA	United States Environmental Protection Agency
UST	Underground storage tank
UV	Ultraviolet
VC	Vinyl chloride
VOC	Volatile organic compounds
WWTP	wastewater treatment plant

Attachment 4
Former Phillips Display Components Facility
Seneca Falls, New York
Site and Regional Setting

1.0. Environmental setting

This attachment describes the Site and regional setting of the Site in greater detail and includes sections on climate, soils, land use, geology, and hydrogeology.

1.1. Climate and water budget

New York has a short but intense growing season with cool nights and warm humid but not hot days. The winters tend to be extremely cold. The mean annual temperature of Seneca County is 47.8 degrees Fahrenheit. Based on climatic data from Geneva, New York, an average of 32.60 inches of precipitation is received annually, with a low record of 22.81 inches and a high record of 40.41 inches. Approximately 30 percent of the total annual precipitation occurs between June and August (Crain 1974).

Precipitation data is used to calculate an area's water budget and estimate of groundwater recharge. The mean monthly potential evapotranspiration and overland runoff are subtracted from mean monthly precipitation to obtain a water surplus or deficit value. From December through April a water surplus generally exists in Seneca County and groundwater recharge can occur. However, the high potential evapotranspiration rate during the late spring and summer months creates water deficit conditions that normally prevent significant recharge and drops the moisture content of the soil below field capacity. The soil moisture deficit must be overcome before recharge can again occur. Since the average annual precipitation is approximately 32.60 inches and the total calculated evapotranspiration is estimated to be 22.60 inches, an average of 10 inches is available for runoff and recharge and to overcome soil moisture deficits (Crain 1974). Water budget conditions will change as climatic conditions fluctuate.

1.2. Site environmental setting and land use

The environmental setting and land use varies across the Site's 85 acres. Since the Site is an industrial/commercial complex, this is the predominant current and anticipated future land use. However, there are four potential environmental settings/land uses on and adjacent to the Site, industrial, undeveloped, waterways, and residential. These settings are described below.

Industrial area

The industrial area includes a series of interconnected buildings covering approximately 13 of the Site's 85 acres. This area is characterized by man-made structures such as buildings, paved parking lots, and roadways. The industrial area is commonly accessed by people working in and visiting the industrial buildings.

Undeveloped area
The portion of the Site not covered by buildings or the asphalt parking lot is grass, scrub vegetation, or woodland. The majority of this open space is on the east side of the Site. Most of this area is not commonly accessed by people and is, therefore, largely undisturbed.

Van Cleef Lake and the Seneca River/Barge Canal
An escarpment forms a natural border between the Site and Van Cleef Lake and the Seneca River/Barge canal to the south. The waterways are located 500 feet south of the industrial buildings. Water is drained from Van Cleef Lake on an as needed basis (generally biannually) to allow for inspection of previous repair work[1] of nearby locks. The water levels will usually be lowered in January, and could remain drained until April. If additional repair work is required, the lake will be drained in consecutive years. The area does not appear to be used for recreational purposes.

Residential area
The Seneca Falls facility is bordered to the west by a senior living complex, Prospect Hill Apartments. The apartments were constructed and occupied in 2001. This land was previously owned by the Former Philips Display Components and was used as a parking lot. Residential houses are also located northwest of the Site, on the north side of the railroad tracks.

1.3. Regional geology

The following subsections provide descriptions of the physiographic setting, and regional unconsolidated and bedrock geology.

Physiographic setting
The Former Philips Display Components Site is in Seneca Falls, New York. Seneca Falls is in the northern portion of Seneca County, on the northwestern end of Cayuga Lake. Seneca County lies within the Western Oswego River Basin. The Western Oswego River Basin encompasses approximately 2,600 square miles. This basin also includes portions of Wayne County to the north, Cayuga County to the east, Tompkins County to the southeast, Schuyler County to the south, and Ontario and Yates Counties to the west. The drainage within the basin is via a tributary to the Oswego River, which ultimately discharges to Lake Ontario (Crain 1974).

Seneca County lies within two physiographic provinces: the Appalachian Plateau province and the Central Lowland province. The Appalachian Plateau province makes up approximately the southern two-thirds of the County. The Appalachian Plateau is characterized by rolling hills and uplands with large and broad stream and lake valleys lying in between (Mozola 1951). In Seneca County, the Appalachian Plateau rises to nearly 2,000-feet above mean sea level (msl).

The Site lies within the glacial lake plain of the Central Lowland province. The Central Lowland province makes up approximately the northern third of the County. The topography of the Central Lowland is relatively flat with elevations between 400 – 600 feet msl. Drumlins, concentrated mainly to the north of the NYS Thruway (I-90), rise 100 – 300 feet above the

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[1] O'Brien & Gere Engineers, Inc. communication with Robert Horschnieder, Water Engineer for Seneca River and Van Cleef Lake on October 2, 2001.

Lowland plains. The topography is nearly flat, with very little relief between the NYS Thruway and the northern ends of Seneca and Cayuga Lakes (Mozola 1951).

Regional unconsolidated deposits

New York State was subjected to multiple glacial events during the Pleistocene Epoch (1.8 million years ago to 10,000 years ago). Each glacial episode destroyed to a large degree the geologic records of the previous glaciation. During the height of the Late Wisconsin glaciation (approximately 20,000 years ago), a continental ice sheet covered most of New York. The glacial margin extended across northeastern Pennsylvania and northern New Jersey to its southern limit along the length of Long Island, New York. The final retreat of glacial ice from the region occurred about 10,000 years ago.

Glacial drift was deposited beneath and in front of the last ice sheet during the Pleistocene Epoch creating a mantle of unconsolidated material covering nearly the entire bedrock surface of the County. The Pleistocene drift in the northern portion of Seneca County is thicker than that to the south (Mozola 1951). The glacial drift consisted of coarse-grained, stratified sands and gravels deposited by glaciofluvial environments, silts and clays deposited in glaciolacustrine environments, and till consisting of a heterogeneous mixture of non-stratified or poorly stratified material ranging in size from clay to boulders. Local alluvial deposits are confined to narrow bands adjacent to the streams from which they were formed (Mozola 1951). The alluvial material represents reworked till and other glacial deposits consisting of clays, silts, sands, and gravels.

Regional bedrock stratigraphy

The bedrock within the Central Lowlands physiographic region is of Devonian and Silurian age. The Appalachian Plateau physiographic region bedrock is of Devonian-age. The bedrock generally strikes east-west with a gentle regional southward dip of approximately 50 feet per mile and is approximately 750 feet thick (Crain 1974). The bedrock from oldest to youngest are represented by the Camillus Shale and Bertie Limestone members of the Salina Group, and the Cobleskill Dolomite, Rondout Limestone, and Manlius Limestone. The local Devonian-age bedrock from oldest to youngest are represented by the Oriskany Sandstone, Onondaga Limestone, four shale members of the Hamilton Group, the Tully Limestone, three shale members of the Genesee Group, and shales and sandstones of the Sonyea, West Falls, and Java Groups (Crain 1974).

A bedrock elevation contour map of the northern portion of Seneca County is included as Figure 4. As shown on this figure, a relatively narrow bedrock trough (elevation contour of 400 feet msl) is present near Seneca Falls extending approximately midway between Seneca Falls and Waterloo to the west. This trough lies to the north of the Cayuga-Seneca Canal. As the trough does not directly coincide with the Cayuga-Seneca Canal, it may represent a paleochannel.

1.4. Site geology

The geology underlying the Site consists of unconsolidated glaciolacustrine silts and clays with some gravel, cobbles, and sand overlying bedrock. The unconsolidated deposits were either fill or overburden of glaciolacustrine origin. The thickness of the unconsolidated materials ranges from approximately 20 feet at bedrock monitoring well MW-BR-04 to approximately 45 feet at bedrock monitoring wells MW-BR-02 and MW-BR-03.

The overburden is composed of brown to gray silts and silty clays, and some fine sands. The sands that were encountered were in thin lenses, not of sufficient thickness or areal extent to be correlated across the Site. Gravel, cobbles, and boulders were also occasionally encountered in the glaciolacustrine deposits.

The glaciolacustrine materials are underlain by the Bertie Limestone. The Bertie Limestone is characterized as a hard, dense limestone exhibiting irregular conchoidal fractures. The limestone was deposited in beds ranging in thickness between 2- to 10-inches and is separated by thin friable shale partings. Although the Bertie Limestone is reported to be only 30 feet thick in Seneca County; approximately 120 feet of similar limestone was penetrated at monitoring well MW-BR-01. The band of limestone is responsible for the higher pH characteristic of the soils in the northern Finger Lakes Region. The limestone is underlain by Camillus Shale that consists of calcareous shale layers with occasional thin dolomitic limestone beds. Beds can be up to 4 inches thick highly fractured, and characterized by irregular bedding planes and numerous voids (Mozola 1951).

Bedrock cores were collected on top of the escarpment north of the facility (MW-BR-02) and below the escarpment adjacent to the Cayuga-Seneca Canal (MW-BR-05). The core logs are in Appendix A. The bedrock encountered is described as dark gray limestone with numerous gypsum veins characterized as slightly fractured to sound. The upper 5 feet of bedrock at MW-BR-05 had a rock quality designation (RQD) of 68 percent, indicating fair rock quality. The remainder of the wells had RQDs ranging from 90 to 100 percent.

Topography
Topography across the Site is generally flat with the ground elevation decreasing towards the barge canal. A 35-foot escarpment borders the south side of the Site. The elevation of the top of bedrock varies across the Site from a high of approximately 431 feet msl at MW-BR-01 to a low of approximately 377 feet msl at MW-BR-04. Based on this data, the top of bedrock appears to slope to the northeast and south beneath the Site.

1.6 Result of Hydrogeological Investigation

A direct hydraulic connection does not appear to be present between the two subsurface groundwater flow units (overburden and bedrock). Historical groundwater flow data collected from the overburden unit indicates flow predominantly to the southeast. Based on monitoring data, groundwater flow in the bedrock unit has yet to be adequately determined. A discussion of these units is provided below.

Overburden
Figure 6 depicts the potentiometric surface in the overburden unit. The general overburden groundwater flow pattern appears relatively consistent over time. Based on the March and September 2001 overburden groundwater elevation measurements, the rate of groundwater flow (average linear velocity) to the south and to the southeast within the overburden unit was

calculated to be approximately 0.007 feet/day (2.5 feet/year) and 0.004 feet/day (1.5 feet/year), respectively. These velocities are based on Darcy's Law, modified to account for effective porosity as follows:

$$v = Ki/n_e$$

where "v" is velocity (feet/day), "K" is average hydraulic conductivity (0.10 feet/day), "i" is the calculated hydraulic gradient, and n_e is the effective porosity, assumed to be 0.18 based on the specific yield of a silt matrix (Fetter 1980). The average hydraulic conductivity value was obtained from a slug test conducted by Chester Environmental on monitoring wells MW-20 through MW-29. These results are presented in the *Interim Sampling Visit Investigation* report, Appendix D (Chester 1994).

Bedrock

Groundwater flow within the bedrock hydrogeologic unit underlying the Site occurs principally through secondary porosity features such as fractures, joints, and bedding planes. Regional information indicates that two distinct sets of joints occur in Seneca County, dip joints and strike joints (Mozola 1951). The main set of joints or dip joints, trend between N. 15°-30° E. to N. 30°-45° W. The joint planes range between 46° to nearly vertical. The other set of joints (strike joints) trend from N. 60°-70° E. at right angles to the dip joints. Joint spacing ranged between 1- to 48-inches (Mozola 1951). Vertical fractures or joints were not evident from the rock cores at wells MW-BR-02 and MW-BR-05.

A groundwater contour map of the bedrock unit for the September 2001 monitoring period is shown on Figure 7. Some of the well data may not be reliable due to questionable construction methods used during installation. Review of the static bedrock groundwater elevations indicate that the bedrock wells located at the base of the escarpment (MW-BR-05 and MW-BR-06) are influenced locally by Van Cleef Lake and the Cayuga-Seneca Canal.

On September 26, 2001, surface and groundwater elevations were collected across the Site. The groundwater elevation recorded at MW-BR-06, which is located adjacent to Van Cleef Lake (near the dam), was 405.11 feet msl. The surface water elevation of Van Cleef Lake was 430.2 feet msl. This would indicate that Van Cleef Lake was locally recharging the bedrock groundwater near MW-BR-06. In addition, the groundwater elevation of 430.51 feet msl at MW-BR-01, which is located approximately 250 feet north of Van Cleef Lake, was similar to the lake elevation.

The groundwater elevation recorded at MW-BR-05 was 384.49 feet msl. In comparison, the surface water elevation of the Cayuga-Seneca Canal was 383.7 feet msl. This would indicate that bedrock groundwater was locally discharging near the Cayuga-Seneca Canal. Bedrock groundwater near MW-BR-05 appears to be in good hydraulic connection with the Cayuga-Seneca Canal. Water levels in this well were noted to rise rapidly when the lock gate was opened (to release water to the canal) and quickly decline upon gate closure. In addition, groundwater elevations at MW-8 to MW-BR-05 and the surface water elevation of the Cayuga-Seneca Canal indicate that bedrock groundwater flows to the south toward the Cayuga-Seneca Canal.

Given the inconsistent water levels at wells MW-BR-02 and MW-BR-03, the current groundwater elevations from the bedrock monitoring wells do not provide sufficient information to address Site-wide groundwater flow conditions. The inconsistent bedrock well construction techniques need to be further evaluated to ensure that the collected data is representative and usable.

Seasonal fluctuations

Groundwater levels fluctuate seasonally in the overburden and bedrock hydrogeologic units. Generally, the overburden monitoring wells with the greatest fluctuations are in the grassy areas on the eastern portion of the Site. These wells include MW-1, MW-27, and MW-29. The likely reason that water level fluctuations are more pronounced in these wells is that they are in areas of the Site that likely have greater infiltration and evapotranspiration rates than wells located beneath the asphalt. Historical data indicate that overburden groundwater elevations at the Site are generally highest during the spring and summer months and lowest during the fall and winter months.

Water level trends in the bedrock were evaluated from the data collected from six previous bedrock wells (MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12) installed between September 1983 and July 1984. The six wells were located in the southeast portion of the Site near the former filter cake dump pit and holding lagoon. With the exception of MW-8, one year or less of water level data is available. In addition, the water levels recorded in MW-8 during the Chester investigation represented post-sampling levels and not static conditions. As a result, water level trend data in the bedrock has been difficult to evaluate.

This data is supplemented by water levels from bedrock wells MW-BR-01 through MW-BR-06 installed during June 2001. However, data to date do not provide sufficient information to evaluate seasonal trends across the Site. Further, the inconsistent water levels that have been recorded from these wells indicate that the bedrock wells may be unreliable.

Based on the data collected during the Chester investigation, the water levels in the bedrock show similar seasonal fluctuation trends as in the overburden, although the fluctuations are less pronounced. The groundwater elevations in the bedrock on the southeast side of the Site were highest during the summer months, declined through the fall, were lowest during the winter, and began to increase again during the spring. The wells typically fluctuated approximately 1- to 2-feet between monitoring events.

1.7. Conceptual hydrogeologic system

A conceptual model of the hydrogeologic system near the Site has been developed based on information obtained during various investigations. The unconsolidated deposits are comprised of a layer of fill material and overburden glaciolacustrine deposits having a thickness of approximately 20 to 45 feet. The groundwater table occurs in this hydrogeologic unit at depths between 1 and 7 feet bgs. Locally, horizontal groundwater flow in the overburden is to the south and east, as shown on Figure 6. There also appears to be a less significant yet present vertical component of groundwater flow due to downward hydraulic gradients. Due to the presence of sporadic sand lenses within the overburden silts and clays, the horizontal component is likely the most significant flow component.

As groundwater flow in the overburden approaches the escarpment south of the facility, the horizontal component of overburden groundwater flow is likely lost to evapotranspiration along the escarpment face. The vertical component of overburden groundwater may flow to the underlying bedrock, although the three bedrock interface wells have remained dry since installation.

Data from the former bedrock monitoring wells installed by Chester Environmental indicate that bedrock groundwater levels were below the bedrock surface. However, the June 2001 bedrock wells show water levels above the bedrock surface. Well MW-BR-04 is an artesian well located adjacent to the Cayuga-Seneca Canal. The groundwater elevation (approximately 25 feet above ground surface or 424.7 feet msl) in this well is similar to the elevation of Van Cleef Lake.

Recharge to the bedrock immediately beneath the Site is likely from Lake Van Cleef and possibly from sand lenses in the till unit. At certain times of the year the Cayuga-Seneca Canal appears to recharge the bedrock groundwater. At other times (particularly when the surface water elevation of the canal is lowered during winter months) the bedrock groundwater likely discharges to the Cayuga-Seneca Canal. The bedrock groundwater is likely continually recharged by the lake and discharged to the river, except during periods when the lake level is intentionally dropped for maintenance and repairs along the dam and locks. This anthropogenic alteration of groundwater flow patterns may cause a localized bedrock groundwater flow path around the dam from west to east under the southern portion of the Site.

Attachment 5
Former Phillips Display Components Facility
Seneca Falls, New York
Site History and Chain of Title Report

1. Previous Site owners and operators

An *EDR-Historical Chain of Title Report* (EDR 2000) was obtained from EDR in July 2000 to identify the current and previous owners. The *Historical Chain of Title Report* is presented as part of this attachment. Former Site owners in chronological order starting with the earliest listed owner, are presented below.

- Sylvania Electric Products Incorporated (Massachusetts Corporation)
- Sylvania Electric Products Incorporated (Delaware Corporation)
- On December 23, 1970 Sylvania changed its name to GT & E Sylvania Incorporated
- On January 9, 1980 GT & E Sylvania Incorporated became GTE Products Corporation
- North American Philips Consumer Electric Corporation
- North American Philips Corporation
- Seneca County Industrial Development Agency (SCIDA)

GTE Operations Support Incorporated (GTEOSI) is successor in interest to GTE Products Corporation for this matter.

Site Operations

A sequential list identifying reported Site operators from the 1940s until present is shown below.

- Sylvania Electric Products Incorporated
- GTE Products Corporation
- Former Philips Lighting
- Philips ECG
- Seneca County Industrial Development Agency
- Landsman Development Corporation (LDC)
- LDC Seneca Corporation
- LDC Seneca Associates
- HP Neun Company (currently leases the Site from SCIDA)
  Tenants:
  John Sipos, Attorney
  Raymond Kelley Associates
  Tri State Hospital Supply
  Spectrum Industries
- Prospect Hill Apartments (southwest corner of the former Site)

1.1. Background information

The five original facility buildings were constructed in 1914 by the Rumsey Pump Corporation, which had foundry and machining operations. In the 1940s, Sylvania purchased the plant, expanded the facilities, and began the manufacture of black and white television picture tubes. During the 1960s, Sylvania began to manufacture color television picture tubes. Philips Display Components acquired the property in the early 1980s and continued production until the mid-1980s. The facility was subsequently sold to the Seneca County Industrial Development Agency (SECOR 1996). In 1989, H.P. Neun Company, Inc. began leasing the Site and currently subleases building space to several tenants. The facility is used for commercial purposes including offices and warehousing.

Manufacturing at the facility during Sylvania's ownership included interior coating of tubes with a variety of phosphors, manufacture of metal components and fittings, and assembly of television tubes. Processes included cleaning, finishing, coating, and tube salvage operations (Chester 1995b). The original manufacturing by Sylvania was conducted in Buildings 1 through 5. Over time, the facility was expanded to include Buildings 6 through 13. By 1972, Sylvania was conducting most of its manufacturing in Buildings 8, 10, 10A, 11 and 13 (Chester 1995b).

Between 1948 and 1972, the facility discharged process waters to Van Cleef Lake and the Seneca River/Barge Canal through several outfalls along the escarpment located south of the facility. Prior to 1972, the sumps and pits at the Site conveyed the process wastewater through sewer lines to the outfalls. The outfalls were not monitored during this period. By 1981, many of the sumps, pits, and drains in the original sewer system were filled with concrete and abandoned (Chester 1995a).

In 1971 and 1972, Sylvania segregated the sewer lines handling non-process wastewater (storm and floor drains) from those handling process wastewater requiring treatment. In conjunction with these changes an industrial wastewater treatment plant (IWWTP) was constructed. The IWWTP treated hydrofluoric acid, chrome, lead-bearing caustic, and acid wastewater. In addition to the IWWTP, a sewer line was installed on the south side of the facility to intercept the wastewater outfalls and divert the wastewater to the IWWTP. Plant wastewater was subsequently conveyed to a settling lagoon prior to discharge to the Seneca River/Barge Canal under a New York State Pollution Discharge Elimination System (SPDES) Permit NY-0001228 (Chester 1995a). By 1992, the lagoons and IWWTP were decommissioned (Keystone 1992b). The SPDES permit was canceled in February 1990. Currently the sewer system conveys storm water runoff from roof drains and exterior catch basins and discharges the storm water to the Seneca River/Barge Canal.

1.2. Historical orders, decrees, permits, or approvals

Historical documents and Environmental Data Resources (EDR) Radius Map with GeoCheck Report (EDR 2000b) were reviewed to obtain a Site-related list of orders, decrees, permits, violations, or approvals regarding the Environmental Conservation Law (ECL) or equivalent federal environmental status. Also, a variety of investigations were conducted between 1986 and 2001. These investigations included the collection of soil and ground water from Site locations that were thought to be potential residual environmental sources. A list of RCRA milestones is included in Table 1-1 below.

Table 1-1 RCRA Documents and Reporting Milestones

7	1980	Philips informed EPA that facility involves "hazardous waste" per Section 1004 (5) RCRA, 42 U.S.C 6903(5) and 40 CFR 261.3 (required by 11/19/1980?)	*Cited in: USEPA Complaint Docket No. II RCRA-*
7	1984	Philips submitted a Part B application (7/23/1984).	*Cited in: USEPA Complaint Docket No. II RCRA-*
2	1985	EPA Notice of Deficiency (NOD) to Philips (2/15/1985) set new date for submission of Part B as 4/9/1985.	*Cited in: USEPA Complaint Docket No. II RCRA-*
2	1985	Philips requests additional extension for submittal of Part B	*Cited in: USEPA Complaint Docket No. II RCRA-*
3	1985	EPA Addendum to NOD to Philips (3/27/1985) extended Part B submission to 5/9/1985	*Cited in: USEPA Complaint Docket No. II RCRA-*
5	1985	EPA grants extension for submittal of Part B until 6/7/1985.	*Cited in: USEPA Complaint Docket No. II RCRA-*
6	1985	Philips response to NOD and addendum to NOD (6/6/1985)	*Cited in: USEPA Complaint Docket No. II RCRA-*
7	1985	NYSDEC request to Philips for "financial assurance" in lieu of TSDF permit	*Letter 7/09/1985*
9	1985	Incinerator taken out of service	*Cited in: Fact Sheet of Closure Plan Public Notice (9/22/1987)*
9	1985	Incinerator Feed Storage Tanks taken out of service	*Cited in: Fact Sheet of Closure Plan Public Notice (9/22/1987)*
11	1985	EPA finds Philips response to NOD and addendum to NOD incomplete and deficient, and, therefore, in violation (11/15/1985) - $9,500 penalty proposed.	*USEPA Complaint Docket No. II RCRA-85-0209*
10	1985	NYSDEC/Philips Consent Order - MWs - violations of recordkeeping and reporting procedures; MW network incapable of identifying impact of releases.	*NYSDEC to Philips Oct 30,1985*
11	1985	USEPA Complaint Docket No. II RCRA-85-0209	*USEPA Complaint*
11	1985	NYSDEC second request to Philips for financial assurance in lieu of TSDF permit	*Letter 11/21/1985*
11	1985	Philips "financial assurance" bond Rider to provided to NYSDEC	*Letter 11/27/1985*
7	1986	Work Plan - Philips ECG, Inc. Closure Plan (Two Hazardous Waste Surface Impoundments and Incinerator) (7/1986)	*Chester (July 1986)*
5	1987	Work Plan - Philips ECG, Inc. Closure Plan (Two Hazardous Waste Surface Impoundments and Incinerator) revision (5/22/1987)	*Chester (May 1987 rev.)*
9	1987	NYSDEC Direction to provide newspaper public notice, by 9/30/198, of application for closure of two impoundments and an incinerator by Philips.	*NYSDEC to Philips Sep 22,1987*
9	1987	NYSDEC SEQR (Unlisted Status) Negative Declaration - Determination of Non-Significance (9/22/87) for Philips EPA I.D. No. NYD002246015.	*Cited in: Fact Sheet of Closure Plan Public Notice (9/22/1987)*
10	1987	Philips field effort to determine if "a release potentially harmful to human health and the environment" has taken place per 40 CFR part 264 App. IX.	*Cited in: Report on Soil Sampling for (RCRA) Clo Documentation*
1	1989	Report - Report on Soil Sampling for (RCRA) Closure Documentation - HWMUs	*Chester (January 1989)*
?	1989	Surface Impoundments removed.	*Cited in: Report on Soil Sampling for (RCRA) Clo Documentation*
?	1989	Incinerator and feed tanks removed.	*Cited in: Report on Soil Sampling for (RCRA) Clo Documentation*
2	1990	NYSPEDES Permit (NY-0001228) (Note: Not RCRA a "permit by rule") to discharge was cancelled by new owner (2/1/1990).	*Cited in WWTP Decommissioning Report (Keystc 1991)*
8	1991	Sediment sampling in Lake and Canal requested by NYSDEC	*Philips Meeting Notes (8/20/91) Galloway (GTE) A. Russo (NAPC)*
5	1992	Report - Waste Water Treatment Plant (WWTP) Decommissioning Report	*Keystone (May 1992b)*
6	1992	NYSDEC response to 5/13/1992 meeting issues - Inaccessible SWMUs, TPH Analysis, Action Levels	*NYSDEC to Philips (June 8,1992)*
6	1992	Work Plan - Sampling Visit (SV) Work Plan Vol. 1 Management Plan	*Keystone (June 1992a)*
6	1992	Work Plan - Sewer Evaluation Work Plan	*Keystone (June 1992c)*
7	1992	Work Plan - Supplemental Sampling Visit Work Plan USTs and Old Sewers	*Keystone (July 1992d)*
9	1992	Work Plan - Addendum to Closure Plan	*Keystone (September 1992e)*
9	1992	Work Plan - Status of seven work plans	*NYSDC to Philips Sep 25, 1992*
3	1993	Report RCRA Post-Closure Groundwater Monitoring Report	*Chester (March 1993)*
5	1993	Action Levels	*NYSDC to Philips May 25,1993*
7	1993	Report - Phase II Ground Water Screening (GWS) Survey	*Chester (July 1993)*
3	1994	Report - Interim Sampling Visit Investigation (ISVI) Report	*Chester (March 1994a)*
3	1994	Report - Sampling Visit Investigation (SVI) Report	*Chester (March 1994b)*
12	1994	Report - MW-1 RFI Report	*Chester (December 1994c)*
2	1995	Report - Sewer Evaluation (SE) Report	*Chester (February 1995a)*
3	1995	Report - Supplemental Sampling Visit Investigation (SSVI) Report	*Chester (March 1995b)*
6	1995	Report - Potential Remedial Alternatives for Remediation of Impacted Soil and Groundwater	*Groundwater Technologies (June 1995)*
7	1995	Groundwater Sampling Plan w/ Appendix B - Report of Subsoil Results	*Groundwater Technologies (July 1995)*
7	1996	Work Plan - RFI Work plan	*SECOR (July 1996)*
10	1999	Work Plan - Addendum to RFI Work plan	*O'Brien & Gere (1999)*
6	2000	Work Plan - Response for Comments on Addendum to RFI Work plan	*Cited in: Fact Sheet of Closure Plan Public Notice (9/22/1987)*

A RCRA Part B application, dated July 23, 1984 was submitted to NYSDEC by Philips. The application was not formally processed by NYSDEC because Phillips withdrew the application during the Interim Status period, before a draft RCRA permit was issued by the State. The application was withdrawn in 1986 when Phillips chose to close the Interim Status hazardous waste management units (lagoons, incinerator, incinerator feed tanks, and container storage areas). The decision to withdraw the permit triggered RCRA Closure of the listed units, Post-Closure monitoring on the surface impoundments, and Corrective Action at Solid Waste Management Units (SWMUs). A RCRA Post-Closure permit was never issued, and after three years of groundwater monitoring at the former impoundments, post-closure activities were discontinued. The Corrective Action activities began with the RCRA Facility Assessment (RFA) and a series of sampling visits in the early 1990s, and continuing into a RCRA Facility Investigation (RFI), which is being reported on here. A list of milestones, documents related to previous RCRA investigations, groundwater monitoring, and closures (Including title, author, and date) performed at the Site is presented in Table 1-1 on the previous page.

1.3. Previous investigations and RCRA closure assessments

Various investigations and remedial activities were conducted over the last twenty years to identify and address areas of environmental concern. The investigations were performed in conjunction with RCRA Interim Status requirements and subsequent RCRA closure of the surface impoundments on the east side of the Site. The impoundment (Waste Water Effluent Settling Lagoon), which discharged to SPDES Outfall 001 in the Seneca River, was closed in conformance with RCRA regulations in 1987 (Chester 1994b). In addition to the closures under RCRA, eleven underground storage tanks (USTs) previously used to store methanol or petroleum fuels have been closed (Keystone 1992, Chester 1994b). The RFI Work Plan (SECOR 1996), which was submitted to NYSDEC states: "All regulated units at the facility have been closed in accordance with the Facility Closure Plan. Closure has been approved by the New York State Department of Environmental Conservation (NYSDEC)." These past activities are summarized in Table 1-1.

In 1993 and 1994, Chester Environmental collected samples of shallow sediments/soils adjacent to seven historic outfalls to the Seneca River and Van Cleef Lake. Figure 2 shows the locations of historic outfalls. Samples were analyzed for VOCs, cadmium, chromium, lead, zinc, fluoride and pH. VOCs were not detected. Several inorganic compounds, however, were detected at levels above the NYSDEC TAGMs.

A walkover of Site grounds and portions of the facility's interior was conducted on April 30, 1999 by OBG to observe current conditions and identify the locations of monitoring wells and former Outfall areas 1, 2, and 3. During the walkover, the sump in Building 3, which was not previously identified on a map of the Site sumps and collection pits, was observed. The remainder of the sumps were reportedly backfilled with cement during closure activities prior to transfer of the property (Chester 1995a). The previous locations of floor drains and their closed status were evident from the cemented areas in the building floor.

1.1.6 Site solid waste management units (SWMUs)

The Philips Closure Plan (Chester 1986) lists the hazardous waste management units (HWMUs) as two surface impoundments, an incinerator, two incinerator-feed tanks and four container storage areas. The impoundments and incinerator-related units have been closed according to the Closure Plan (Chester 1986) and the *Report on Soil Sampling for Closure Documentation – Hazardous Waste Management Units* (Chester 1989). The container storage areas were retained as less than 90 day RCRA storage units, operational until March 10, 2005 pursuant to the 6 NYCRR Subpart 373 and Part 373.1.1(d)(1)(iii).

According to the RCRA Facility Assessment Sampling Visit Investigation Report (Chester 1994b), five initial SWMUs were investigated. The areas investigated were the Interim Drum Storage Area, the Satellite Storage area, the former underground fuel oil tank, the polychlorinated biphenyl (PCB) capacitor storage area, and a former open burning area. In addition, selected sumps, pits and floor drains were investigated. Investigations of areas beneath floor slabs were not performed, since the former plant buildings were declared to be an inaccessible SWMU (Chester 1994b). The current RFI investigation expands on the former investigation of these units.

HISTORICAL CHAIN OF TITLE REPORT

O'BRIEN & GERE ENGINEERS, INC.
50 JOHNSTON STREET
SENECA FALLS, NEW YORK

Submitted to:

ENVIRONMENTAL DATA RESOURCES, INC.
C/O
O'BRIEN & GERE ENGINEERS, INC.
5000 Brittonfield
Syracuse, New York 13221
315-437-6100

Attention: John Hunt

Project No. N00-1753

January 8, 2002

Nationwide Environmental Title Research hereby submits the following ASTM historical chain-of-title to the land described below, subject to the leases/miscellaneous shown in Section 2. Title to the estate or interest covered by this report appears to be vested in:

SENECA COUNTY INDUSTRIAL DEVELOPMENT AGENCY

The following is the current property legal description:

All that certain piece or parcel of land being further bound and described in attached vesting deed, lying and situate in the City of Seneca Falls, County of Seneca, State of New York.

1. HISTORICAL CHAIN OF TITLE

1. Sylvania Electric Products, Inc., a Massachusetts corporation acquired title to the property prior to 1940.

2. DEED:

RECORDED:	03-02-1959
GRANTOR:	Sylvania Electric Products, Inc., a Massachusetts corporation
GRANTEE:	Sylvania Electric Products, Inc., a Delaware corporation
INSTRUMENT:	Bk 287, Pg 193

3. DEED:

RECORDED:	06-27-1981
GRANTOR:	GTE Products Corporation, formerly known as GTE Sylvania Incorporated, formerly known as Sylvania Electric Products, Inc., a Delaware corporation, also formerly known as Sylvania Electric Products, Inc., a Massachusetts corporation
GRANTEE:	North American Philips Consumer Electronics Corporation, a Delaware corporation
INSTRUMENT:	Bk 388, Pg 1038

4. DEED:

RECORDED:	12-13-1989
GRANTOR:	North American Philips Corporation, successor in interest to North American Philips Consumer Electronics Corporation, a Delaware corporation
GRANTEE:	Seneca County Industrial Development Agency
INSTRUMENT:	Bk 462, Pg 272

2. LEASES AND MISCELLANEOUS

1. LEASE:

RECORDED:	02-22-1990
LESSOR:	Seneca County Industrial Development Agency, a New York public benefit corporation
LESSEE:	LDC Seneca Associates, a general partnership
INSTRUMENT:	Bk 464, Pg 331

2. No environmental liens were found of record.

3. LIMITATION

This report was prepared for the use of Environmental Data Resources, Inc., and O'Brien & Gere Engineers, Inc., exclusively. This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. Nationwide Environmental Title Research does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from the various agencies that make it available. The total liability is limited to the fee paid for this report.