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Federal Express

Crystal Montroy
New York State Department of Environmental Conservation
Bureau of Eastern Remedial Action, Room 242
50 Wolf Road
Albany, New York 12233-7010

Re: Remedial Investigation Results
Former Bulova Corporation Facility
Valley Stream, New York
NYSDEC Site No. 1-30-084

Dear Ms. Montroy:

ENVIRON International Corporation (ENVIRON) has prepared this letter, on behalf of Bulova Corporation (Bulova), to detail results of a remedial investigation completed at the former Bulova manufacturing facility in Valley Stream, New York (the "Site"). The scope of the remedial investigation was developed based on requests from the New York State Department of Environmental Conservation (NYSDEC) to characterize hydrogeologic conditions at and in the vicinity of the Site, delineate the vertical extent of impacted ground water, and evaluate soil vapor quality at the southeast corner of the Site. The following sections provide background information related to the Site history and development of the remedial investigation requirements, detail the scope and results of the remedial investigation, and provide recommendations for additional actions at the Site.

A. Background

1. Location and Physical Setting

The Site is located in the Town of Hempstead, Nassau County, New York in a mixed-use urban area with residential, commercial, and light industrial properties. The Site is included in the Lynbrook, New York USGS topographic quadrangle and the Site location is depicted on Figure 1. The Site covers approximately 7.2 acres and is bordered to the northwest and northeast by retail stores and paved parking areas. The Green Acres shopping mall is immediately northeast of the Site. The northern limits of the retail stores and parking areas are bordered by the Sunrise Highway and the Far Rockaway branch of the Long Island Railroad. A residential area is adjacent to the eastern property boundary. Light industrial facilities, including distribution and shipping companies, are located to the south of the Site at the Airport Industrial Office Park (AIOP). John F. Kennedy International Airport is approximately 2 miles southwest of the Site. The Site layout and the surrounding area are depicted on Figure 2.

Hook Creek, an intermittent stream, is located beyond the western edge of the Site. The creek receives storm water drainage from the Site as well as from upgradient areas including the paved parking areas, Sunrise Highway, and the Long Island Railroad adjacent to Sunrise Highway. Hook Creek flows south, merges with Valley Stream approximately 0.5 miles south of the Site, and then flows to the west, discharging to Jamaica Bay. Clear Stream, located approximately 0.3 miles southeast of the Site, flows to the south and joins Valley Stream approximately 0.2 miles upstream of Hook Creek. In the vicinity of the Site, the Nassau/Queens County line roughly follows Hook Creek.

2. Geology

The Site is located within Long Island's glacial outwash plain, which extends 10 miles southward from the Ronkonkama and Harbor Hill terminal moraines to the south shore. Surface topography at the Site is flat, with surface elevations ranging from approximately 8 to 10 feet above mean sea level (AMSL). Topography in the vicinity of the Site is also generally flat and gently slopes toward the south and southeast in the direction of Hook Creek and Valley Stream.

The Site is underlain by upper Pleistocene deposits, which form the upper glacial aquifer. The upper Pleistocene deposits consist mainly of stratified beds of fine to coarse sand and of sand and gravel. Thin beds of silt and clay are often interbedded with the coarse-grained material. The upper glacial aquifer is underlain by the "20-foot" clay and the Gardiners Clay. The "20-foot" clay is lithologically similar to the underlying Gardiners Clay and the two units are distinguished primarily by stratigraphic position. In some portions of southern Nassau County, the "20-foot" clay is separated from the Gardiners Clay by a layer of upper Pleistocene deposits. The "20-foot" clay and the Gardiners Clay represent the major confining layers within the upper portion of the ground water reservoir beneath Nassau County. Additional information related to the regional geology is detailed in the *Geologic Review and Well Record Search Results* letter report (ENVIRON, April 16, 1998).

3. Site History

Industrial operations at the Site are believed to have started in the late 1920s with the construction of the Curtiss-Wright Airport in 1929.[1] Airport-related structures at the Site included airplane hangars and a portion of the runway. Although Curtiss Flying Service abandoned the airfield in approximately 1938, several other air service companies continued to operate the airfield. Occupants included the Columbia Aircraft Corporation, which built airplanes for military and private concerns between 1940 and 1948. The Bulova Watch Company leased the property from 1948 until 1960, when Bulova took title to the property.

When Bulova took occupancy of the Site in 1948, two airplane hangars existed on the eastern portion of the Site. Based on discussions with Bulova personnel, it is believed that Bulova connected the airplane hangars in 1952, creating Building No. 1. Building No. 2 was erected west of Building No. 1 in 1967. During Bulova's occupancy, the eastern and

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[1] Information related to prior site operations was obtained from a Phase I environmental assessment performed by Certified Engineering and Testing Company during 1990.

northern portions of the Site were paved; a portion of the paved area incorporated the original concrete airfield runway, which traversed the eastern portion of the property of the Site from north to south. Bulova ceased operations at the Site during 1990 and title of the property was transferred to Home Depot in April 1993. As detailed in ENVIRON's March 26, 1999 letter, Bulova's operations at the Valley Stream facility did not include the use of any radioactive materials.

The Site was redeveloped during 1993. Redevelopment included demolition of all existing Site structures and construction of a Home Depot retail store. The entire Site is currently covered by the Home Depot building and the associated paved parking areas. Potable water and sanitary service at the Site are provided by the local municipal authority. Storm water drainage from the building roof and paved parking areas is collected at a series of catch basins and directed via reinforced concrete piping beyond the eastern property boundary.

4. Remedial Investigation Development and Objectives

The remedial investigation was completed in two phases. The initial phase was completed during January 1999 in response to an August 14, 1998 correspondence from the NYSDEC to Bob Weber and a subsequent conference call on September 8, 1998. As proposed in ENVIRON's December 16, 1998 correspondence, sampling activities completed during January 1999 included the completion of two off-site soil borings (SB-2 and SB-3) and the collection of one round of ground water samples from each monitoring well at the Site. The off-site soil borings were completed to (1) confirm the continuity and thickness of the "20-foot" clay; (2) identify the top of the Gardiners Clay; and (3) determine if the "20-foot" clay and the Gardiners Clay represent a single confining unit or if a transmissive zone of upper Pleistocene deposits is present between the clay units.

The second phase of the remedial investigation was completed during April 1999. The scope of the April 1999 investigation was developed to address data gaps identified during a March 2, 1999 meeting between NYSDEC and the New York State Department of Health (NYSDOH). NYSDEC requested additional sampling activities in a letter dated March 12, 1999 and the proposed scope of work was provided to NYSDEC in a letter from ENVIRON dated March 26, 1999. NYSDEC comments related to the proposed investigation were detailed in a letter dated April 12, 1999. The final scope of work included the collection of soil gas samples from six points at the southeastern portion of the Site (including an ambient air sample), completion of two deep on-site soil borings with soil conductivity logging, collection of ground water samples from several depth intervals at two on-site locations, and collection of ground water samples from monitoring wells MW-HD4 and MW-HD6. Ground water level measurements were collected at the on-site monitoring wells during the January and April 1999 field investigation.

B. Remedial Investigation Results

As described above, the remedial investigation included the completion of deep soil borings and collection of ground water level measurements to characterize local hydrogeology, collection of soil gas samples to determine volatile organic compound (VOC) concentrations in the unsaturated zone at the southeastern portion of the Site, and the collection of ground water samples to characterize shallow and deep ground water quality at and in the vicinity of the

Site. NYSDEC representatives observed field activities completed by ENVIRON during January and April 1999.

Drilling activities during the remedial investigation were performed using Geoprobe and rotary drilling rigs. Drilling services were provided by TerraProbe, Inc., of Carversville, Pennsylvania and Advanced Drilling, Inc., of Washington, New Jersey. Analytical laboratory services were provided by Accutest, Inc., of Dayton, New Jersey, a NYSDOH ELAP CLP-certified laboratory. In accordance with prior requests from NYSDEC, sample containers were unpreserved. NYSDEC ASP Category B laboratory deliverables are provided as Attachment I to this letter. Data Usability Summary Reports are provided as Appendix A. The following sections summarize findings of the hydrogeologic characterization, detail results of the soil gas and ground water sample collection activities, and provide a summarized compilation of Freon compound sampling results at the Site, as requested by NYSDEC.

1. Hydrogeologic Characterization

Off-Site Soil Borings

Based on NYSDEC requests in an August 14, 1998 letter and as discussed during a September 8, 1998 conference call, two soil borings were completed to the south of the Site. NYSDEC requested that the soil borings be completed to confirm the continuity and thickness of the "20-foot" clay, determine if a transmissive zone was located between the "20-foot" clay and the Gardiners Clay in the vicinity of the Site, and locate the top of the Gardiners Clay. Locations for soil borings beyond the southern Site boundary were selected by ENVIRON and NYSDEC on December 10, 1998, following receipt of access approval from the AIOP property owner. Drilling was completed on January 9 and 10, 1999. The locations of the two off-site soil borings (SB-2 and SB-3) are depicted on Figure 2.

The off-site soil borings were each completed to a depth of approximately 65 feet below ground surface (bgs). Consistent with results of regional geologic investigations and prior Site-related sampling, soil sampling identified fine to medium sands to a depth of approximately 44 to 45 feet bgs. A clay unit, suspected to be the "20-foot" clay, was encountered at SB-2 and SB-3 at depths of 44 and 45 feet bgs, respectively. The thickness of the clay ranged from approximately 4 to 7 feet at the off-site soil borings. An approximately 5-foot-thick layer of silty fine sands was encountered at each soil boring location and is suspected to be associated with upper Pleistocene deposits between the "20-foot" clay and the Gardiners Clay. These intermediate upper Pleistocene deposits were underlain by glauconitic silty fine sands with trace amounts of clay, believed to represent the Gardiners Clay, at each off-site soil boring. Soil boring logs are provided in Appendix B. Following completion, each soil boring was pressure grouted with a cement/bentonite grout.

Ground water samples were collected at soil borings SB-2 and SB-3 in conjunction with the off-site drilling activities. Sampling intervals at each location were selected by ENVIRON and NYSDEC based on soil classification data gathered during drilling and were targeted toward zones above the "20-foot" clay, between the "20-foot" clay and the Gardiners Clay, and within the Gardiners Clay. Ground water samples were collected from each interval using a HydroPunch sampling device. Results of the off-site ground water sampling activities are summarized below.

On-Site Soil Conductivity Borings
Based on results of the March 1999 meeting with NYSDOH, NYSDEC requested that additional on-site Geoprobe sampling be completed to determine the vertical extent of impacted ground water. In order to delineate the vertical extent of on-site impacted ground water, ENVIRON and Bulova proposed to collect deep ground water samples from several intervals at two points at the southeastern corner of the Site (GP-5 and GP-9). Direct push borings (GP-5B and GP-9B) were completed adjacent to GP-5 and GP-9 prior to ground water sample collection to characterize the lithology at each location and select appropriate ground water sampling intervals. The lithologic characterization was completed on April 19, 1999, using a Geoprobe Direct Image Soil Conductivity System.

Soil conductivity borings at GP-5B and GP-9B were completed to depths of approximately 74 and 76 feet bgs, respectively. Soil conductivity measurements are depicted on Figure 3. Soil classification data gathered during drilling at off-site soil borings SB-2 and SB-3 and at on-site deep soil boring SB-1 were used to calibrate the soil conductivity measurements with local geologic conditions. Lithologic conditions encountered at GP-5B and GP-9B were generally consistent with prior drilling activities at and in the vicinity of the Site. Logging at GP-5B identified sandy deposits underlain by a clay unit, suspected to be the "20-foot" clay, at approximately 38 to 44 feet bgs. Logging at GP-9B did not detect this upper clay unit. A silty sand unit, consistent with the suspected Gardiners Clay unit observed adjacent to the Site at AIOP, was identified at approximately 45 to 52 feet bgs at GP-5B and GP-9B. Following completion of each conductivity log, the soil borings were pressure grouted with a cement/bentonite grout.

Following evaluation of the soil conductivity logs, ground water samples were collected from several discrete depth intervals at GP-5 and GP-9. Sampling depths were selected by ENVIRON and NYSDEC, and were targeted toward the top of the saturated zone, above the first potential confining unit encountered, below the suspected Gardiners Clay unit, and at the bottom of each boring. Ground water samples were collected from each interval using a Geoprobe sampling device. Results of the deep on-site ground water sampling activities are summarized below.

Ground Water Flow Evaluation
ENVIRON collected water level measurements at each on-site monitoring well during January and April 1999 to confirm the ground water flow direction within the shallow portion of the water-bearing zone. Another round of water level measurements had been collected by Soil Mechanics Environmental Services (Soil Mechanics) during September 1998 in conjunction with a closed NYSDEC spills file (Spill No. 93-07732). The depth-to-ground water measurements and corresponding ground water elevations for each gauging event are presented in Table 1.

Between September 1998 and April 1999, ground water levels at the Site increased by an average of approximately 0.6 feet. The measured water level fluctuations are believed to be consistent with seasonal variation in the water table elevation. Water level measurements collected during prior investigations at the Site have identified seasonal water level fluctuations of up to approximately 2 feet. Water level measurements collected during June 1998 did not suggest the potential for tidal influences on the ground water levels at the Site.

The ground water elevations were used to plot the potentiometric surface in the upper portion of the water-bearing zone beneath the Site. No significant changes in the ground water flow direction were identified based on the September 1998, January 1999, or April 1999 water level measurements. As depicted on Figures 4 through 6, shallow ground water flow beneath the Site appears to be directed toward the southeast, consistent with prior ground water measurement events. The potentiometric surface beneath a majority of the Site continues to display a very small hydraulic gradient of less than 0.001 ft/ft. Consistent with results of prior water level measurement events at the Site, a slightly higher hydraulic gradient (approximately 0.001 ft/ft) was identified at the northwestern corner of the Site between September 1998 and April 1999. The slight difference in hydraulic gradient beneath the Site is suspected to be related to localized variations in recharge patterns.

2. Soil Gas Sample Collection

Based on results of the March 1999 meeting with NYSDOH, NYSDEC requested that soil gas samples be collected from the southeastern corner of Site to characterize concentrations of VOCs in the unsaturated zone. Soil gas samples were positioned in the vicinity of prior ground water sampling points to allow for correlation between reported VOC concentrations in ground water and soil gas. Soil gas sampling points are depicted on Figure 7. Numerous underground utilities and the presence of outdoor storage containers used by the current property owner limited access within the southeastern portion of the Site.

Soil gas sampling activities were completed on April 19, 1999 using a Geoprobe sampling device. Sampling intervals were targeted toward approximately 3.5 to 4.0 feet bgs. Water level measurements at MW-HD4 and MW-HD6 identified ground water at approximately 6 feet bgs. Soil gas samples were collected in Tedlar bags and laboratory analyzed for VOCs plus a 5-compound forward library search using EPA Method TO-14. Proper surface seals were maintained at each sample point and minimal purge rates were used to minimize the potential for artificial introduction of ambient air into the subsurface vapor. As requested by NYSDEC in a letter dated April 12, 1999, soil gas sampling activities included the collection of an ambient air sample (using the soil gas sampling equipment) within the study area prior to initiating the soil gas survey. Soil gas samples were hand delivered to the laboratory by ENVIRON on April 19, 1999.

Soil gas sampling results are summarized in Table 2. Based on analytical results associated with the ambient air sample, reported concentrations of several VOCs (i.e., benzene, chloroform, ethylbenzene, methylene chloride, toluene, and xylenes) within the soil gas samples are believed to be related to ambient conditions at the Site and/or laboratory procedures and not indicative of Site-related contamination. With the exception of sampling results at GP-8 and GP-15, reported concentrations of Freon 113 are also believed to be related to ambient conditions at the Site and/or laboratory procedures and not indicative of Site-related contamination. As detailed in the Data Usability Summary Report provided in Appendix A, the reported Freon 113 concentrations at GP-15 have been identified as estimated concentrations with a probable high bias. In addition, reported Freon 113 concentrations at GP-15 increased with each sample dilution, suggesting that the reported concentrations may be partly the result of laboratory procedures. Reported concentrations of other VOCs at GP-15 were consistent across each sample dilution.

Consistent with historical ground water sampling results at the Site, the primary VOCs detected in the soil gas samples (i.e., constituents detected at several points within the study area at elevated concentrations relative to ambient air quality) included 1,1-dichloroethane, tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), and trichloroethene (TCE). Also consistent with prior ground water sampling results, the highest reported VOC concentrations in soil gas were detected in samples collected from points in the vicinity of monitoring well MW-HD4 (i.e., GP-8 and GP-15). With the exception of the reported PCE concentration in the soil gas sample collected at GP-1 (134 ppbv), lower VOC concentrations were detected in soil gas samples collected from points hydraulically downgradient of MW-HD4. Sample point GP-1 is positioned between the Site and commercial/light industrial facilities at AIOP. Much lower PCE concentrations were detected in soil gas samples collected between GP-1 and the residential area beyond the eastern site boundary (i.e. 3.2 ppbv at GP-2 and 2.6 ppbv at GP-9). The lowest VOC concentrations were detected in soil gas samples collected from points near the eastern property boundary.

Based on conversations with NYSDEC, ENVIRON understands soil gas cleanup criteria or screening values are not available from NYSDEC. As a result, ENVIRON has compared the soil gas data generated during the remedial investigation to Residential Volatilization Criteria for Soil Vapors used by the State of Connecticut (RCSA 22a-133k-3). The Residential Volatilization Criteria for Soil Vapors are used, in conjunction with the Volatilization Criteria for Ground Water, to determine the necessity for ground water remediation. The Connecticut Volatilization criteria were developed to evaluate potential exposure to VOC-impacted ground water, via contaminant volatilization, for ground water located less than 15 feet below a building used for residential purposes. Remediation of VOCs to the Volatilization Criteria for Ground Water is not required if the constituent concentration in soil vapors is equal to or less than the Residential Volatilization Criteria for Soil Vapor.

As presented in Table 2, reported VOC concentrations at each soil gas sample point are well below the corresponding Residential Volatilization Criteria for Soil Vapors. Reported soil vapor concentrations were at least two orders of magnitude below the corresponding soil vapor criteria at each soil gas sample point. Based on the decreasing VOC concentrations in the direction of the residential area adjacent to the eastern property boundary and results of the volatilization criteria evaluation, which indicate that reported VOC vapor concentrations are well below an appropriate set of cleanup criteria, ENVIRON and Bulova believe that vapors related to the impacted ground water at the southeastern corner of the Site do not represent a significant health concern and that no further actions are necessary with respect to soil gas at the Site.

3. Ground Water Sample Collection

Off-Site Deep Ground Water Sampling

As described above, off-site drilling activities at AIOP during January 1999 included ground water sample collection from several intervals at soil borings SB-2 and SB-3 to characterize ground water quality to the south of the Site. The off-site soil boring locations are presented on Figure 2. Drilling activities were observed by NYSDEC and ground water sampling intervals were selected to target intervals above the "20-foot" clay, within the transmissive zone between the "20-foot" clay and the Gardiners Clay, and within the Gardiners Clay. Ground water sampling at each soil boring was performed using a HydroPunch sampling device. Ground water samples were hand delivered to the laboratory by a courier and analyzed for VOCs.

As summarized in Table 3, low concentrations of several VOCs were detected in each off-site ground water sample. Reported chloroform and TCE concentrations in samples collected from soil boring SB-2 exceed the applicable New York Ground Water Quality Standard. The only constituent to exceed an applicable ground water quality standard at soil boring SB-3 was *cis*-1,2-dichloroethene, in the deepest ground water sample.

Based on ground water flow patterns at the Site, as depicted on Figures 4 through 6, off-site soil borings SB-2 and SB-3 are not hydraulically downgradient of the Site. Ground water sampling at the Site has identified 1,1-dichloroethene and TCA as two of the primary contaminants of concern. Neither of these compounds was detected in the off-site ground water samples. In addition, although sampling at AIOP has identified concentrations of chloroform above the applicable ground water quality standard, historical sampling results at the Site dating back to 1994 have identified chloroform in only one sample (2 µg/l at MW-HD4 on September 5, 1995). Based on the review of Site-specific ground water flow information and evaluation of constituents detected in ground water beneath AIOP and the Site, ENVIRON and Bulova believe that VOCs detected in the off-site deep ground water samples are not associated with the impacted ground water at the southeastern corner of the Site and that no additional actions by Bulova are warranted with respect to the reported concentrations.

On-Site Vertical Delineation Sampling

In a March 12, 1999 letter, NYSDEC requested that additional sampling be completed at the Site to delineate the vertical extent of impacted ground water, as prior deep sampling had not provided samples with VOC concentrations below the applicable ground water quality standards and off-site drilling results suggested that the clay units beneath the Site may be permeable and/or non-continuous. Additional deep on-site vertical delineation sampling was completed on April 19 and 20, 1999. Sample locations were positioned near the southeastern property boundary in the vicinity of prior Geoprobe sampling locations GP-5 and GP-9. Sampling locations are depicted on Figure 7.

As described above, soil conductivity logging was completed in the vicinity of GP-5 and GP-9 prior to ground water sampling in order to select appropriate sampling intervals. Sampling depths were selected by ENVIRON and NYSDEC and were targeted toward the top of the saturated zone, above the first potential confining unit encountered, below the suspected Gardiners Clay unit, and at the bottom of each boring. Ground water samples were collected from each interval using a Geoprobe sampling device. As requested in the March 12 letter from NYSDEC, each ground water sample was analyzed for Priority Pollutant VOCs plus a 5-compound forward library search and Freon. Following sample collection, each boring was pressure grouted with a cement/bentonite grout. Ground water samples were also collected from monitoring wells MW-HD4 and MW-HD6 during the April 1999 field investigation to support evaluation of the vertical delineation and soil gas sampling results. Monitoring well sampling procedures used during April 1999 were consistent with the methods used during the January 1999 Site-wide sampling event. Monitoring well sampling procedures are detailed below.

As summarized in Table 4, the April 1999 monitoring well sampling results were consistent with recent sampling results (historical results from the monitoring wells are summarized in Table 6). Although the reported concentrations of several VOCs were above the applicable New York ground water quality standard, the VOC concentrations at MW-HD4 were much lower than historical sampling results. Reported concentrations of 1,1-dichloroethane, 1,1-dichloroethene, PCE, TCA, Freon 113, and TCE in the shallow ground water sample collected at GP-9 exceeded the applicable New York ground water quality criteria. TCE, Freon 113, and vinyl chloride were the only compounds detected at concentrations above an applicable New York ground water quality criteria in the shallow sample at GP-5. Lower VOC concentrations were detected in samples from the next deeper sampling interval at both GP-5 and GP-9. TCE was the only compound to exceed an applicable New York ground water quality criteria in these samples. Samples collected beneath the Gardiners Clay at GP-5 and GP-9 did not detect VOCs at concentrations above an applicable New York ground water quality criteria. Based on results of the on-site delineation sampling, the impacted ground water at the southeast corner of the Site extends to approximately 50 feet bgs and does not appear to extend below the Gardiners Clay.

Monitoring Well Sampling

As proposed in the *Ground Water Delineation Investigation Results Report* (ENVIRON, August 5, 1998), ground water samples were collected from the six on-site monitoring wells on January 8, 1999. Depth to water measurements were collected at each well using an electronic depth-to-water indicator prior to purging. All wells were purged a minimum of three well volumes using a peristaltic pump and dedicated polyethylene tubing. Temperature, pH, specific conductance, and dissolved oxygen were measured using a Horiba U-10 water quality meter fitted with a PVC flow-through cell. Ground water field parameters were collected after each well volume was evacuated to ensure the collection of a representative ground water sample. When a sufficient volume of water had been purged from each well, ground water samples were collected using dedicated, disposable Teflon bailers. Care was taken when lowering the bailers so that minimal agitation occurred when the bailer entered the water column. Upon collecting samples, a final set of field parameters were measured and recorded. Field parameter measurements are summarized in Appendix C. Each ground water sample was analyzed for Priority Pollutant VOCs.

As summarized in Table 5, analysis of ground water samples collected from upgradient monitoring wells MW-HD1 and MW-HD2 during January 1999 detected chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, and dichlorodifluoromethane (Freon 12) at concentrations above the applicable New York ground water quality standard. Based on the ground water flow direction at the Site and historical Site operations, the reported VOC concentrations at MW-HD1 and MW-HD2 are not believed to be indicative of Site-related contamination. VOCs were not detected in the sample collected from upgradient monitoring well MW-HD3.

Consistent with historical sampling results at the Site, analysis of ground water samples from monitoring wells MW-HD4 and MW-HD6 detected several VOCs (1,1-dichloroethane, 1,1-dichloroethene, TCA, TCE, and PCE) at concentrations equal to or above the applicable New York ground water quality standards. Trichlorofluoromethane (Freon 11) was also detected in the samples collected from MW-HD4 and MW-HD6 (319 and 679 μg/l, respectively) at concentrations above the applicable standard. Prior sampling at the southeastern corner of the Site had not detected Freon 11. VOCs were not detected in the sample collected from monitoring well MW-HD5. Sampling during 1997 and 1998 at MW-HD5 had detected trace concentrations of several VOCs, and historical sampling had identified VOC concentrations above the applicable New York water quality standards.

Historical ground water sampling results at each on-site monitoring well are summarized in Table 6. As detailed in prior reports and confirmed during the remedial investigation, impacted ground water related to Site operations is located in the vicinity of the southeastern property boundary, with the highest reported constituent concentrations detected in samples collected from monitoring well MW-HD4. Concentrations trends for several compounds detected at MW-HD4 are depicted on Figures 8 and 9 (TCA, 1,1-DCE; and 1,1-DCA, TCE, respectively). As depicted on Figures 8 and 9 and summarized in Table 6, contaminant concentrations have displayed an overall decreasing trend and reported compound concentrations have decreased by as much as approximately two orders of magnitude since a September 1995 sampling event completed by Soil Mechanics.

4. Freon Data Review

Based on the recent Freon detections in ground water samples at the Site, NYSDEC requested that ENVIRON review historical sampling data, including tentatively identified compounds, for Freon compounds. ENVIRON's review included laboratory deliverables associated with each ground water sampling event completed by ENVIRON at the Site between 1991 and 1999 and a summary table related to ground water sampling activities completed at the Site by Soil Mechanics between 1995 and 1998. Based on historical and recent ground water sampling results at the Site, Freon compounds included in ENVIRON's review included trichorofluoromethane (Freon 11), dichlorodifluoromethane (Freon 12), and 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113). Freon 113 is not listed in the Soil Mechanics summary table and laboratory deliverables related to the sampling completed by Soil Mechanics were not available for ENVIRON's review. As a result, ENVIRON was unable to review Freon 113 concentrations related to the Soil Mechanics sampling activities. However, sampling activities completed by ENVIRON have overlapped the Soil Mechanics sampling events and the available laboratory deliverables are believed to provide an adequate representation of Freon 113 concentration trends at the Site. The following information was compiled based on ENVIRON's review of the ground water sampling results at the Site:[2]

- Historical sampling (i.e., 1991 to 1993) at abandoned monitoring wells MW-1, MW-2, MW-4, MW-5, MW-6, MW-7, and MW-8 did not detect Freon compounds. Historical sampling at abandoned monitoring well MW-3 detected low estimated concentrations of Freon 113 with the reported concentrations displaying a decreasing trend (i.e., 35 μg/l during January 1991 to not detected during August 1993). Freon 11 (4 μg/l) was detected at MW-3 during a January 1992 sampling event only. Freon 12 was not detected in samples collected from MW-3.

- Freon compounds have not been detected in samples collected at upgradient monitoring wells MW-HD2 and MW-HD3 between 1995 and 1999. The only Freon compound detection in samples collected from these wells was limited to an estimated concentration of Freon 11 (1.3 μg/l) during June 1994.

- Low concentrations of Freon 12 were detected in samples collected from upgradient monitoring well MW-HD1 during September 1996, December 1996, and January 1999 (7, 6, and 6 μg/l, respectively). Freon compounds were not detected in samples collected from MW-HD1 during 1997 and 1998.

- Freon 113 (25 μg/l estimated) was detected in the initial ground water sample collected at monitoring well MW-HD5 during May 1994. No other Freon compounds were detected in the May 1994 sample and no Freon compounds have been detected at MW-HD5 since May 1994.

- Sampling completed at monitoring well MW-HD4 between 1994 and 1998 did not detect Freon compounds. Sampling completed at MW-HD4 during January 1999 detected Freon 11 (302 μg/l) and Freon 113 (7.8 μg/l estimated). Although the April 1999 sampling event at MW-HD4 did not detect Freon 11, the reported Freon 113 concentration (627 μg/l) was well above the reported January 1999 concentration. Freon 12 was not detected in the samples collected from MW-HD4.

- Monitoring well MW-HD6 was installed during July 1997 and each ground water sampling event at MW-HD6 has detected Freon 113. Reported Freon 113 concentrations have ranged from 64 to 413 μg/l. Freon 11 (679 μg/l) was detected in the January 1999 sample from MW-HD6 only. Freon 12 was not detected in samples collected from MW-HD6.

- Recent Geoprobe sampling at the southeast corner of the Site has also detected Freon 113 in ground water. During November 1997, Freon 113 was detected at

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[2] Monitoring wells MW-1 through MW-8 were installed during 1991 and were abandoned during Site re-development in 1993. Monitoring wells MW-HD1 through MW-HD5 were installed in 1994 following Site re-development. Monitoring well MW-HD6 was installed during July 1997.

GP-3 (3,500 µg/l estimated, at 20 to 24 feet bgs) and GP-4 (36 µg/l estimated at 6 to 10 feet bgs). Freon 113 was also detected at GP-9 (412 µg/l at 6 to 10 feet bgs) and GP-5 (12.4 µg/l at 6 to 10 feet bgs) during April 1999. No other Freon compounds were detected during the on-site Geoprobe sampling activities. Freon compounds were not detected in the off-site Geoprobe or HydroPunch ground water samples.

Consistent with concentration patterns for other VOCs at the Site, elevated concentrations of Freon compounds are present at the southeast corner of the Site. However, while elevated concentrations of other VOCs have been detected in ground water samples collected at the southeast corner of the Site dating back to 1991, Freon compounds were not detected at the southeast corner of the Site until 1997. In addition, while reported concentrations of other VOCs have displayed a decreasing trend since 1995, reported Freon concentrations have significantly increased during the recent Geoprobe and monitoring well sampling events. Based on the recent timing (i.e., 1997 or later) of the Freon compound detections relative to the other VOCs, ENVIRON and Bulova believe that the reported Freon concentrations are related to recent activities at or in the vicinity of the Site. As detailed above, Bulova has not owned or operated the Site since 1993.

In addition to the differences in the timing of the Freon compound detections relative to the other VOCs, the Freon compound concentration patterns also suggest that the reported concentrations are related to a recent release relative to the other VOCs present at the southeastern corner of the Site. As described above, shallow ground water sampling at GP-9, MW-HD4, and MW-HD6 has identified elevated concentrations of several VOCs, including Freon compounds. Although vertical delineation sampling at GP-9 detected elevated concentrations of other VOCs at a depth of 46 feet bgs, Freon compounds were not detected in the samples collected below the upper portion of the saturated zone (i.e., 6 to 24 feet bgs). The limited vertical extent of the elevated Freon compound concentrations relative to the other VOCs at the Site suggests that the reported Freon concentrations are related to a more recent activity at or in the vicinity of the Site. Based on results of the Freon data review, ENVIRON and Bulova believe that no further actions to be completed by Bulova are warranted with respect to the reported Freon concentrations.

C. Conclusions and Recommendations

As detailed above, the remedial investigation has included the completion of deep soil borings and collection of ground water level measurements to characterize local hydrogeology, collection of soil gas samples to determine VOC concentrations in the unsaturated zone at the southeastern corner of the Site, and collection of ground water samples to characterize shallow and deep ground water quality at and in the vicinity of the Site. Based on observations during the deep soil boring program, geologic conditions at and in the vicinity of the Site are consistent with the findings of regional geologic investigations. The upper Pleistocene deposits are underlain by the "20-foot" clay and the Gardiners Clay. Regional geologic investigation reports indicate that the northern boundary of the "20-foot" clay is present in the vicinity of the Site, and remedial investigation results indicate that the "20-foot" clay is discontinuous beneath the Site. Where the "20-foot" clay is present, a thin layer of upper

Pleistocene deposits appears to be positioned between the "20-foot" clay and the Gardiners Clay. Consistent with results of each prior investigation at the Site, shallow ground water flow is directed to the southeast.

Soil gas sampling completed during the remedial investigation has identified VOCs at the southeast corner of the Site. VOCs detected in the soil gas samples were consistent with compounds detected in ground water samples from adjacent ground water sampling points. Also consistent with the ground water sampling results, the highest reported VOC concentrations in soil gas were detected in samples collected in the vicinity of monitoring well MW-HD4. Generally lower VOC concentrations were detected in samples hydraulically downgradient of MW-HD4 and the lowest VOC concentrations were detected in samples collected from points adjacent to the eastern property boundary. As New York State has not established soil vapor cleanup criteria, soil gas sampling results were compared to criteria developed by the State of Connecticut for evaluation of potential residential exposure to VOC vapors associated with impacted ground water beneath a building. Reported VOC concentrations at each soil gas point were well below the corresponding Connecticut Residential Volatilization Criteria for Soil Vapors. Based on the decreasing VOC concentrations in the direction of the residential area adjacent to the eastern property boundary and results of the volatilization criteria evaluation which indicate that reported VOC vapor concentrations are well below an appropriate set of cleanup criteria, ENVIRON and Bulova believe that vapors related to the impacted ground water at the southeastern corner of the Site do not represent a significant health concern and that no further actions are necessary with respect to soil gas at the Site.

Deep ground water samples were collected during the remedial investigation from points beyond the southern Site boundary at AIOP. As detailed above, off-site deep ground water sampling has identified several compounds at concentrations above the applicable New York ground water quality standards. However, based on a review of Site-specific ground water flow information and evaluation of constituents detected in ground water beneath AIOP and the Site, ENVIRON and Bulova believe that VOCs detected in the off-site deep ground water samples are not associated with the impacted ground water at the southeastern corner of the Site and that no additional actions to be completed by Bulova are warranted with respect to the reported off-site VOC concentrations.

Consistent with prior sampling events at the Site, shallow ground water sampling completed during the remedial investigation has identified VOC concentrations above the applicable New York State ground water quality standards at monitoring wells MW-HD1, MW-HD2, MW-HD4, and MW-HD6. Based on the ground water flow direction at the Site and historical Site operations, the reported VOC concentrations at MW-1 and MW-2 are not believed to be indicative of Site-related contamination. The highest VOC concentrations were detected in ground water samples from the southeast corner of the Site at MW-HD4. Results of vertical delineation sampling completed during the remedial investigation indicate that VOC concentrations above the applicable New York State ground water quality standards extend to a depth of approximately 50 feet bgs. However, contaminant concentration trends at the southeast corner of the Site, with the exception of Freon compounds, have displayed an overall decreasing trend and reported VOC concentrations have decreased by as much as approximately two orders of magnitude since a September 1995 sampling event. As detailed above, Freon compound concentration patterns and the recent timing of the Freon detections indicate that the reported Freon concentrations are likely related to activities subsequent to Bulova's ownership and operation of the Site. As such, ENVIRON and Bulova believe that no further actions by Bulova are warranted with respect to the reported Freon concentrations.

Decreasing VOC concentrations have also been identified adjacent to the southeast corner of the Site. Historical ground water sampling at monitoring well MW-HD5 detected concentrations of several VOCs above the applicable New York State ground water quality standards, but VOC concentrations in ground water samples collected from MW-HD5 during 1997 and 1998 were below the applicable standards. VOCs were not detected in the ground water sample collected from monitoring well MW-HD5 during January 1999.

Based on the decreasing VOC concentration trends at the Site, ENVIRON and Bulova believe that active ground water remediation is not warranted and that natural attenuation represents an appropriate alternative to address the impacted ground water at the Site. (Soil remediation to address potential sources of ground water contamination was completed during the property re-development.) Results of a well search, as detailed in the *Geologic Review and Well Record Search Results* letter report (ENVIRON, April 16, 1998), did not identify any potential withdrawal points in the vicinity of the Site. In addition, soil gas sampling results do not suggest the significant potential for health concerns related to potential volatilization of contaminants from the ground water. ENVIRON and Bulova recommend that ground water samples be collected on a semiannual basis from monitoring wells MW-HD4 and MW-HD6 to monitor changes in VOC concentrations for a period of two years. During each proposed sampling event, water level measurements will be collected at each Site-related monitoring well to monitor the ground water flow direction at the Site.

[illegible]

Please contact us at your earliest convenience to discuss any questions or comments.

Sincerely,

Thomas V. Fusillo
Principal

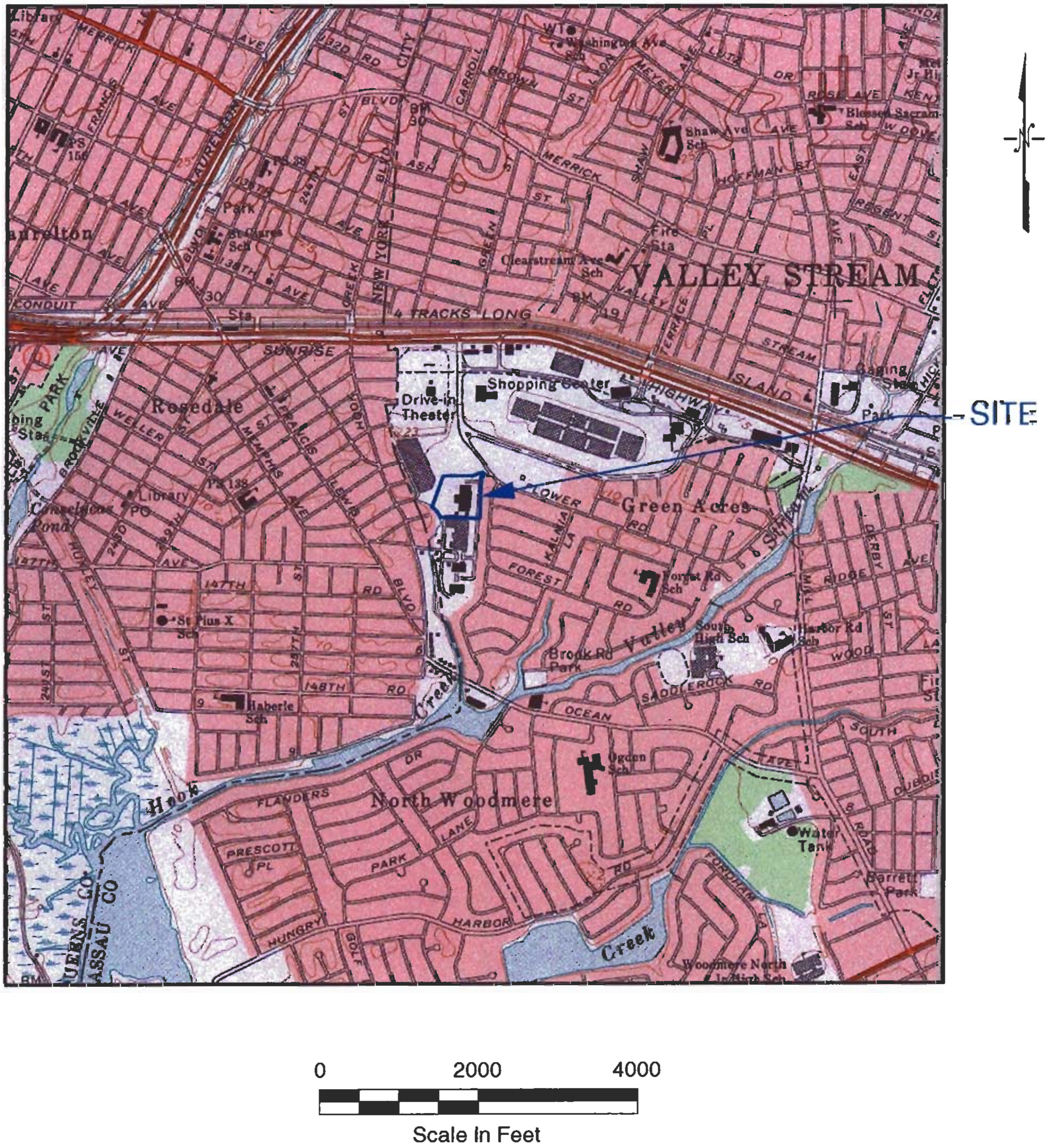
Michael J. Potts
Manager

TVF/MJP:jml
02-1961A:PRIN_WP/11234v1.DOC

Attachment

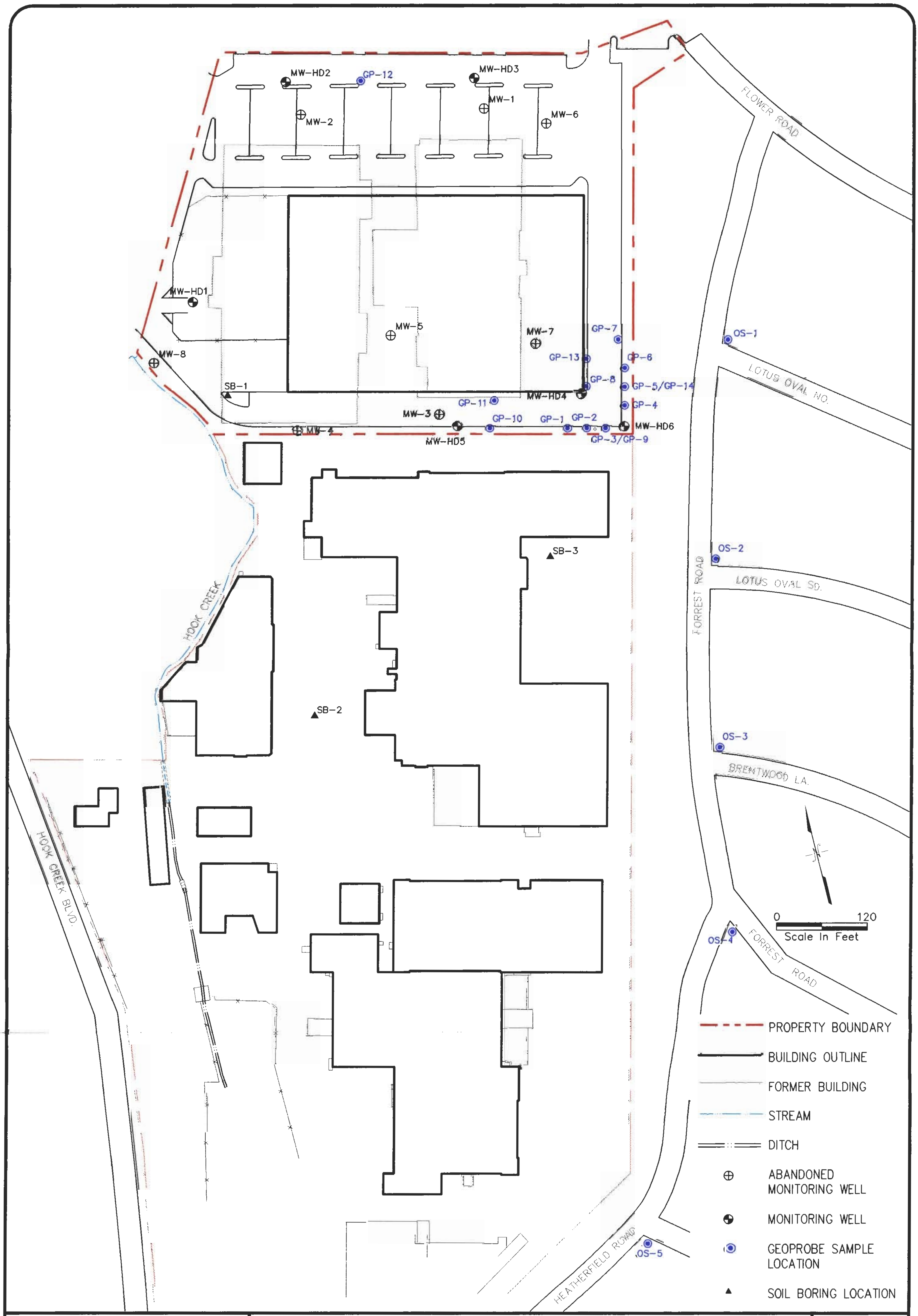
cc: B. Weber

FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, LYNBROOK, NY; 1969.

ENVIRON	SITE LOCATION MAP FORMER BULOVA CORPORATION FACILITY VALLEY STREAM, NEW YORK	FIGURE 1
DRAFTED BY: KPM/TJF DATE: 5/25/99		1961AJ01.PRE



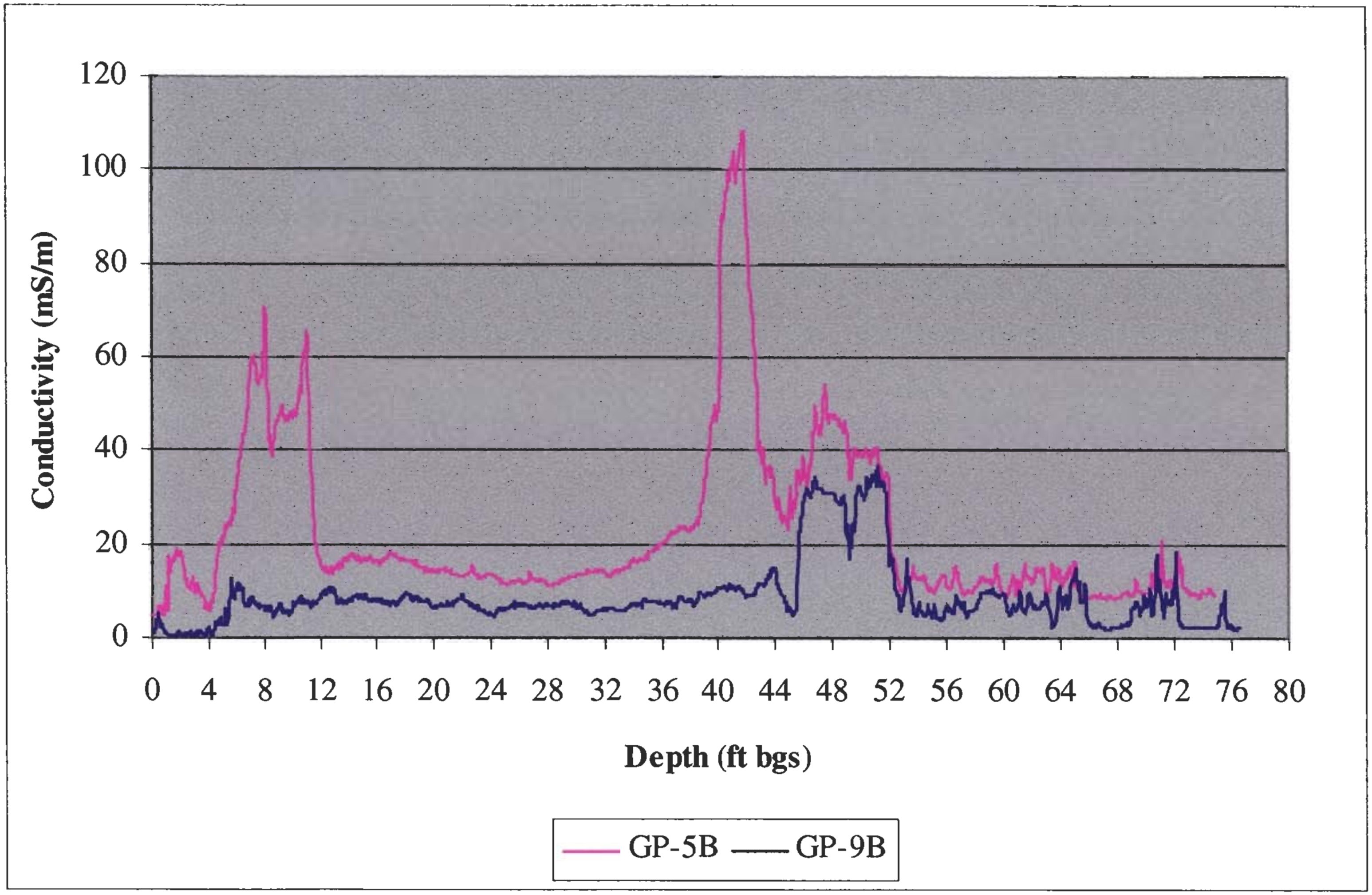
ENVIRON

DRAFTED BY: KPM
DATE: 6/14/99

SITE MAP AND SAMPLING LOCATIONS
FORMER BULOVA CORPORATION FACILITY
VALLEY STREAM, NEW YORK

FIGURE
2

1951A04



ENVIRON

Drafted By: TJF

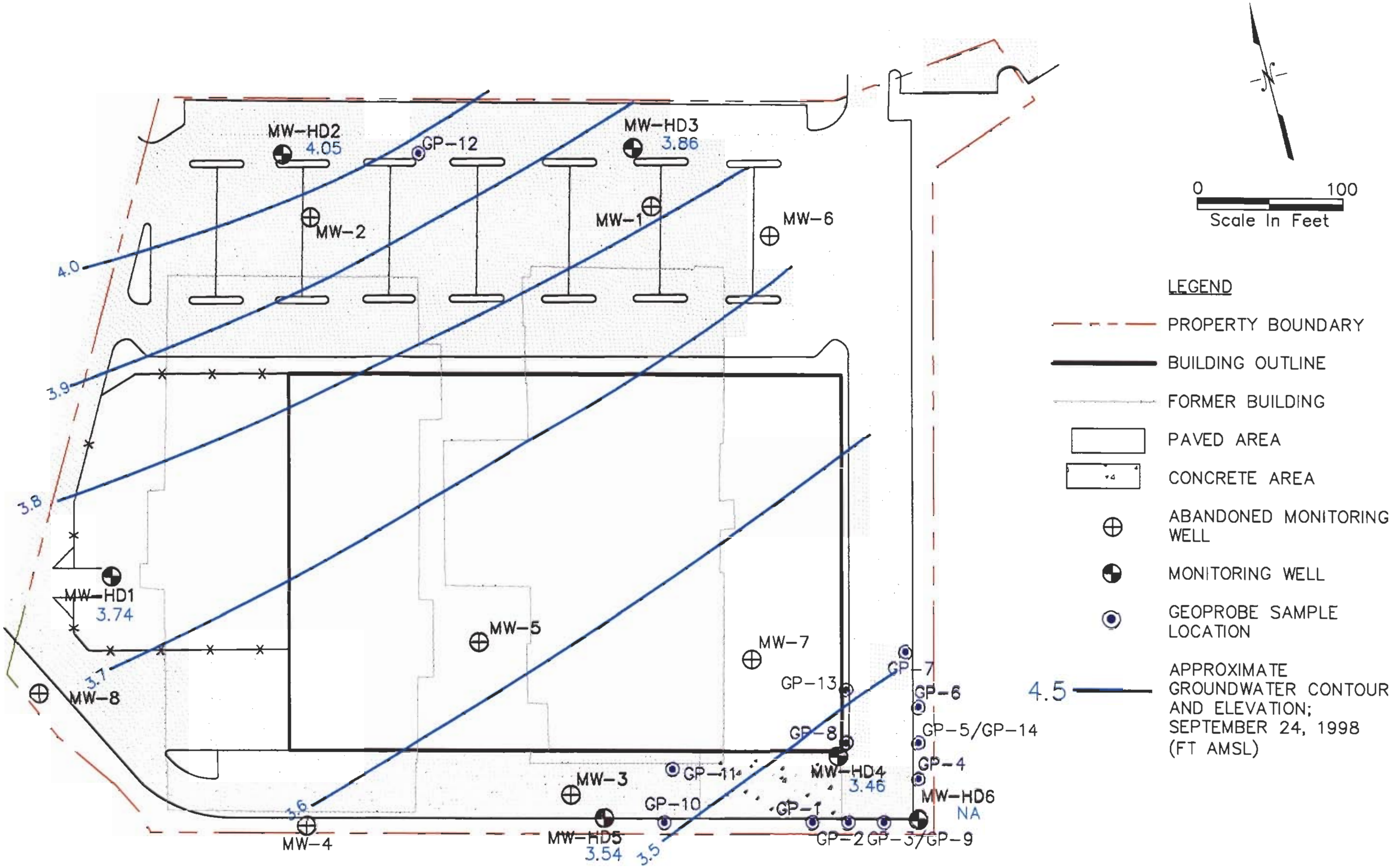
Date: 5/25/99

SOIL CONDUCTIVITY LOGS

FORMER BULOVA CORPORATION FACILITY
VALLEY STREAM, NEW YORK

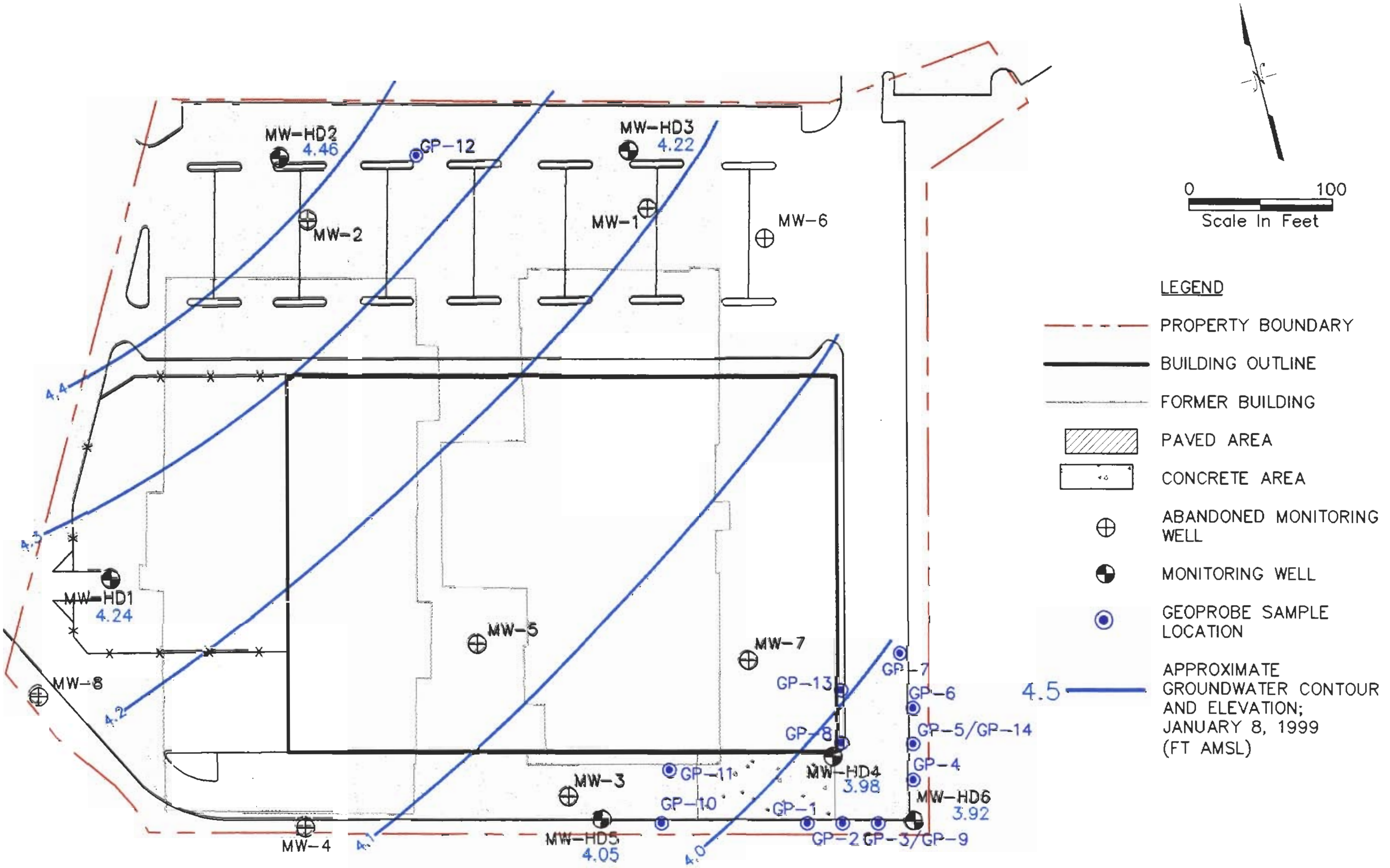
Figure
3

1961AJ02.PRE



SOURCE:
HENDERSON AND BODWELL CONSULTING ENGINEERS
GRADING & UTILITIES PLAN, SEPT. 1992

ENVIRON	GROUND WATER POTENTIOMETRIC SURFACE—SEPTEMBER 1998 FORMER BULOVA CORPORATION FACILITY VALLEY STREAM, NEW YORK	FIGURE 4
DRAFTED BY: KPM/CCG/TP DATE: 5/25/99		1961AW06



SOURCE:
HENDERSON AND BODWELL CONSULTING ENGINEERS
GRADING & UTILITIES PLAN, SEPT. 1992

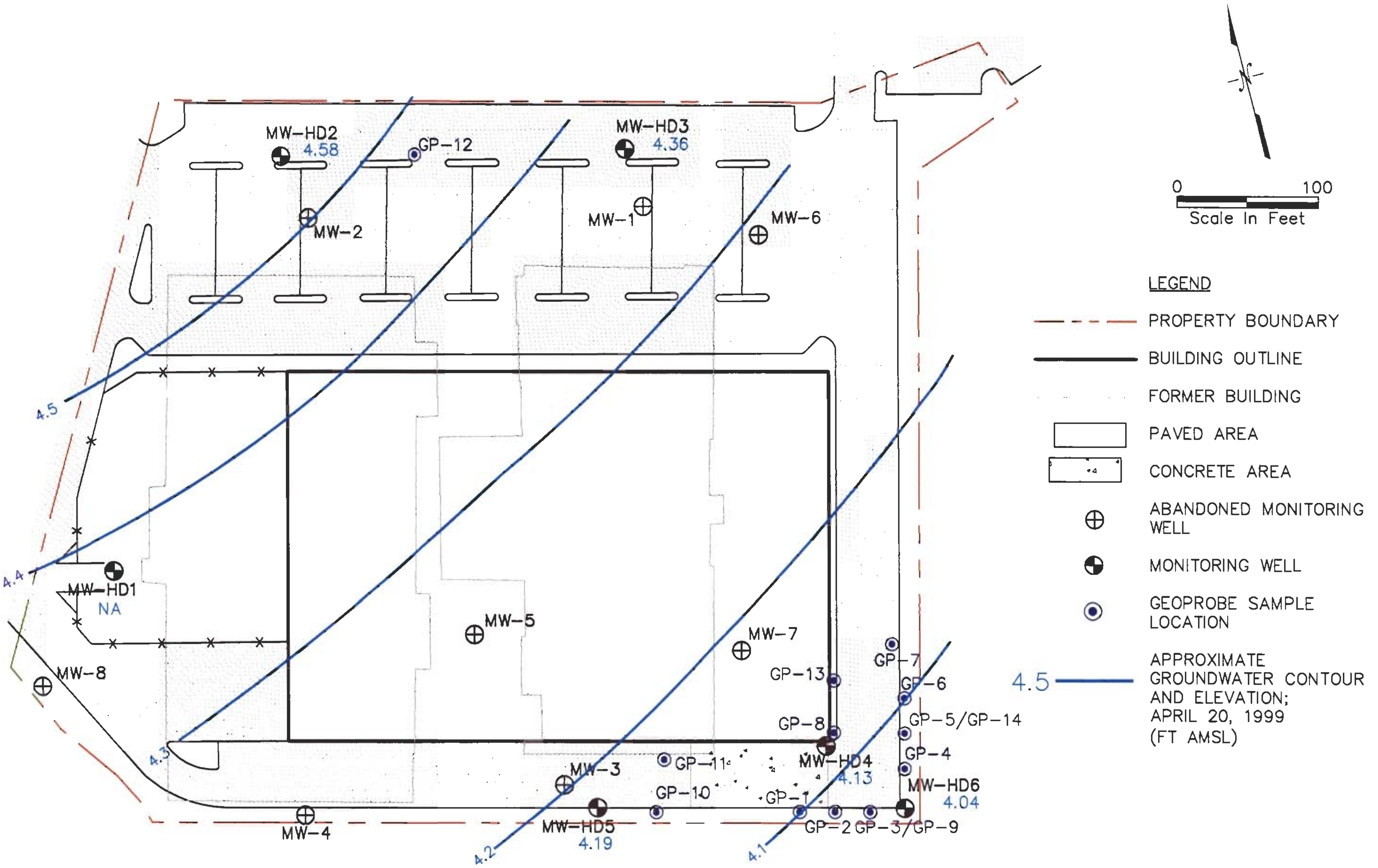
ENVIRON

DRAFTED BY: KPM/CCG
DATE: 5/25/99

GROUND WATER POTENTIOMETRIC SURFACE–JANUARY 1999
FORMER BULOVA CORPORATION FACILITY
VALLEY STREAM, NEW YORK

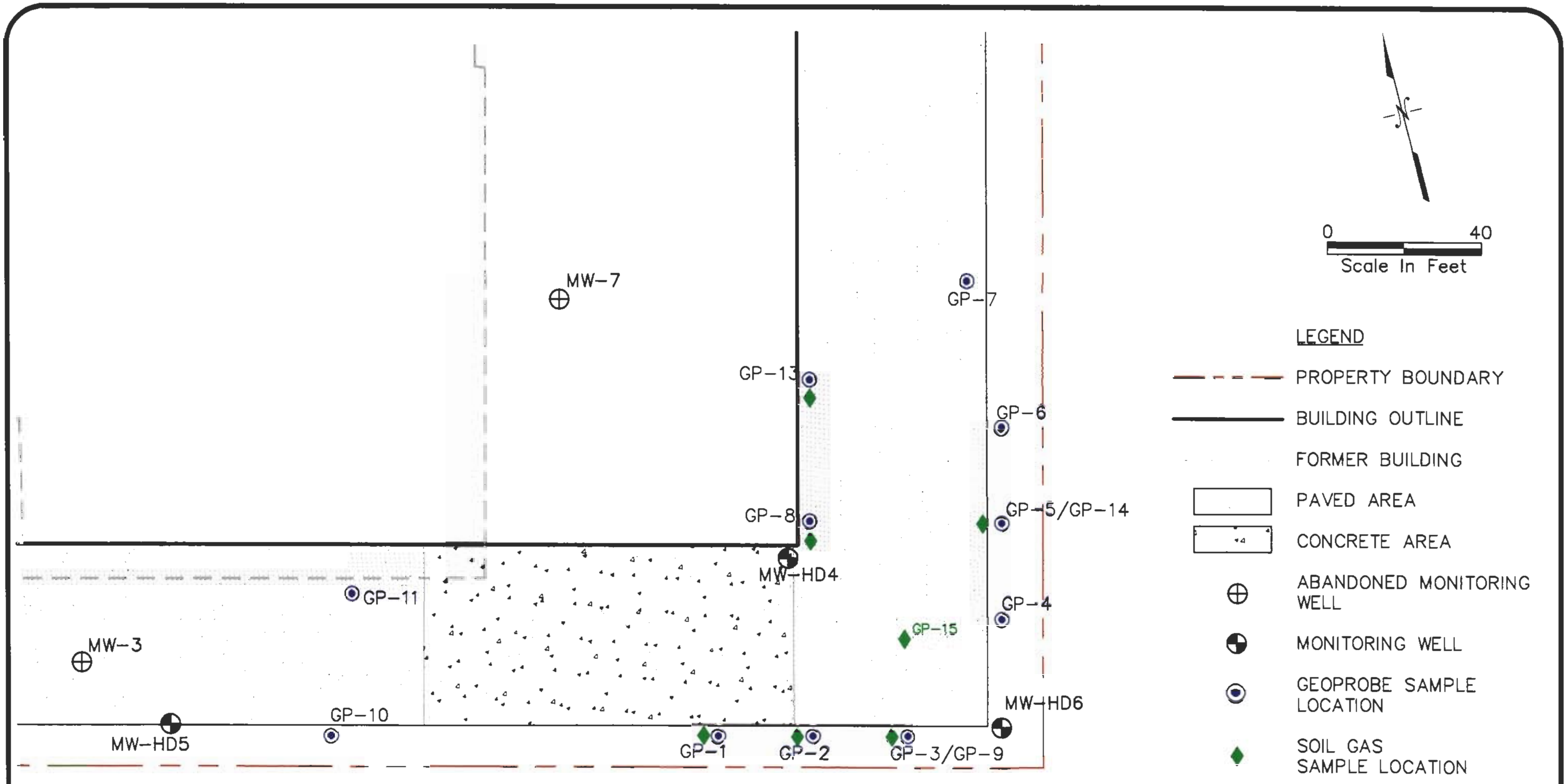
FIGURE
5

1961AW03



SOURCE:
HENDERSON AND BODWELL CONSULTING ENGINEERS
GRADING & UTILITIES PLAN, SEPT. 1992

ENVIRON	GROUND WATER POTENTIOMETRIC SURFACE–APRIL 1999 FORMER BULOVA CORPORATION FACILITY VALLEY STREAM, NEW YORK	FIGURE 6
DRAFTED BY: KPM/CCG · DATE: 5/25/99		1961AW05



SOURCE:
HENDERSON AND BODWELL CONSULTING ENGINEERS
GRADING & UTILITIES PLAN, SEPT. 1992

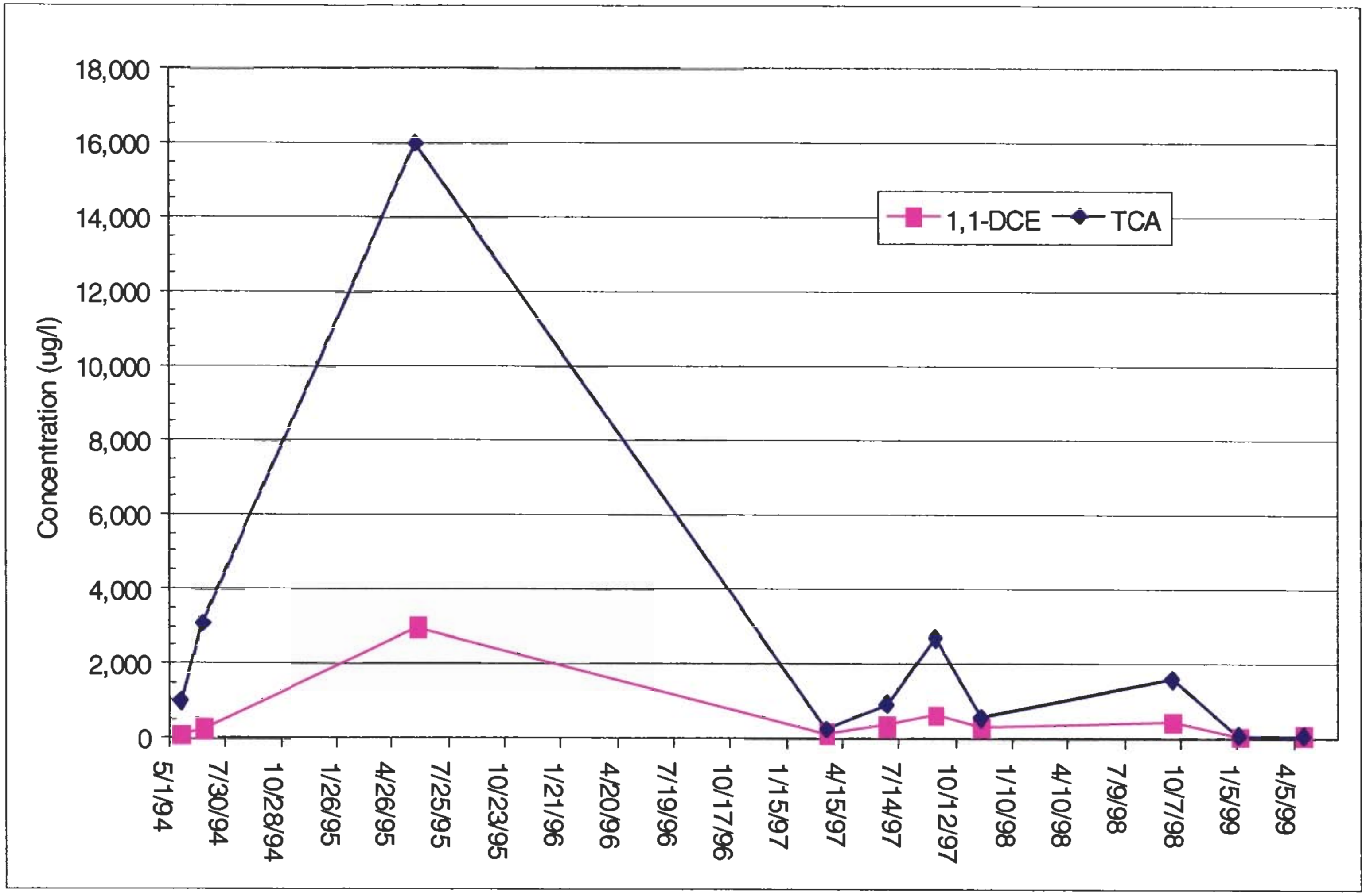
ENVIRON

DRAFTED BY: HFZ/TJF/KPM | DATE: 6/3/99

SOIL GAS AND GEOPROBE SAMPLE LOCATIONS
FORMER BULOVA CORPORATION FACILITY
VALLEY STREAM, NEW YORK

FIGURE
7

1961AW04



ENVIRON

Drafted By: TJF

Date: 5/25/99

MONITORING WELL MW-HD4 - TCA/1,1-DCE CONCENTRATION TRENDS

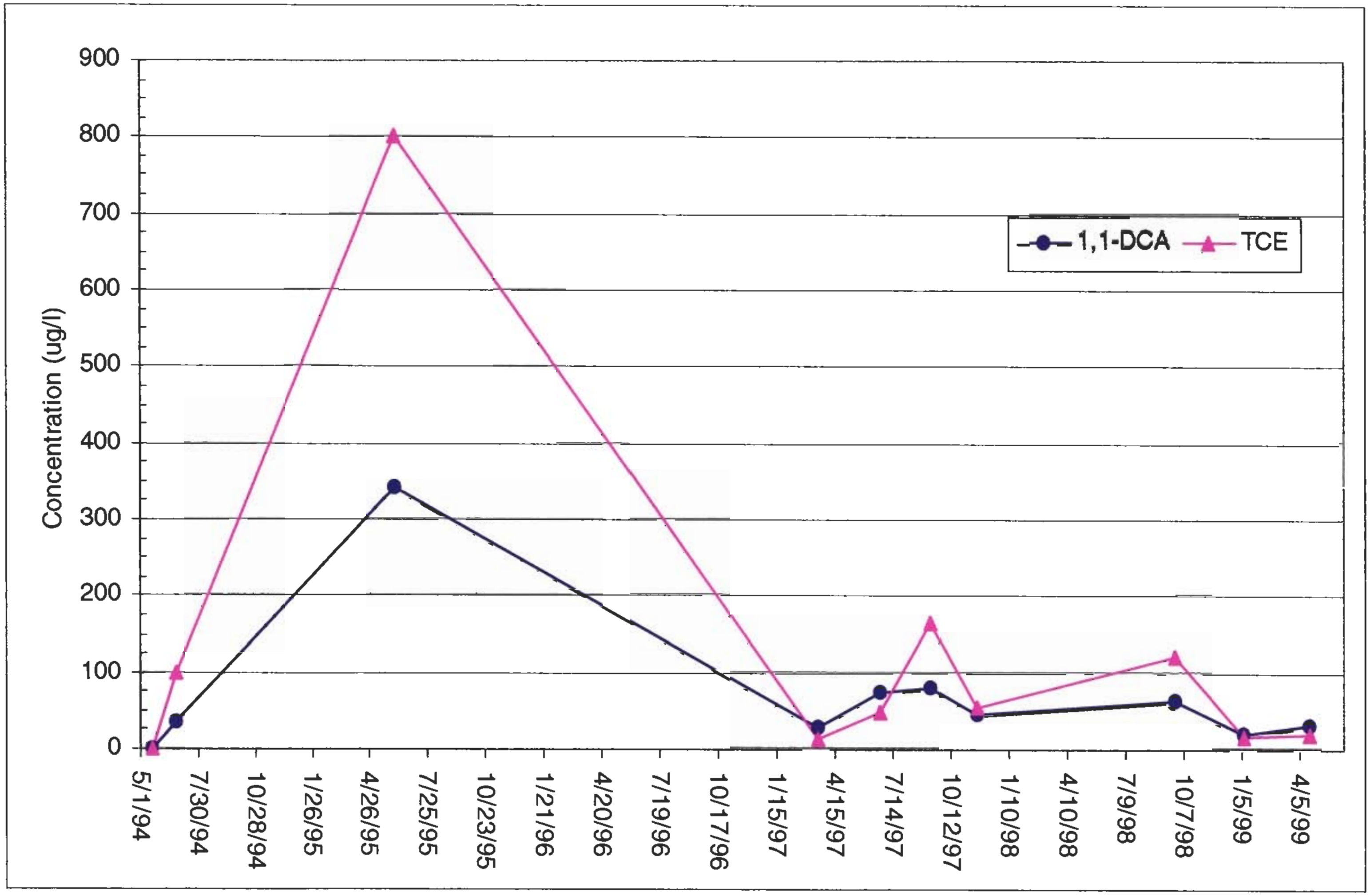
FORMER BULOVA CORPORATION FACILITY

VALLEY STREAM, NEW YORK

Figure

8

1961AJ02.PRE



ENVIRON

Drafted By: TJF

Date: 5/25/99

MONITORING WELL MW-HD4 - 1,1-DCA/TCE CONCENTRATION TRENDS

FORMER BULOVA CORPORATION FACILITY

VALLEY STREAM, NEW YORK

Figure

9

1961AJ02.PRE

TABLES

TABLE 1
Ground Water Elevation Data
Former Bulova Corporation Facility

Monitoring Well	Top of Casing Elevation (ft AMSL)	September 24, 1998		January 8, 1999		April 20, 1999	
		Depth to Water (ft TOC)	Elevation (ft AMSL)	Depth to Water (ft TOC)	Elevation (ft AMSL)	Depth to Water (ft TOC)	Elevation (ft AMSL)
MW-HD1	9.93	6.19	3.74	5.69	4.24	NA	NA
MW-HD2	9.45	5.40	4.05	4.99	4.46	4.87	4.58
MW-HD3	9.93	6.07	3.86	5.71	4.22	5.57	4.36
MW-HD4	10.09	6.63	3.46	6.11	3.98	5.96	4.13
MW-HD5	9.45	5.91	3.54	5.40	4.05	5.26	4.19
MW-HD6	9.97	NA	NA	6.05	3.92	5.93	4.04

Note:

1. Abbreviations:
    TOC: Top of casing.
    AMSL: Above mean sea level.
    NA: Not available.

TABLE 2
Summary of April 1999 Soil Gas Sampling Results
Former Bulova Corporation Facility - Valley Stream, New York

Location	**NA**	**GP-01**	**GP-02**	**GP-05**	**GP-08**	**GP-09**	**GP-13**	**GP-15**	**GP-15**	**Connecticut Residential Soil Vapor Volatilization Criteria (RCSA 22a-133k)**
Sample ID	**FB01-990419**	**GP01-SG01**	**GP02-SG01**	**GP05-SG01**	**GP08-SG01**	**GP09-SG01**	**GP13-SG01**	**GP15-SG01**	**GP15-SG11**	
Sample Date	**4/19/99**	**4/19/99**	**4/19/99**	**4/19/99**	**4/19/99**	**4/19/99**	**4/19/99**	**4/19/99**	**4/19/99**	
Collection Method	**Geoprobe**	**Geoprobe**	**Geoprobe**	**Geoprobe**	**Geoprobe**	**Geoprobe**	**Geoprobe**	**Geoprobe**	**Geoprobe**	
Comments	**Ambient Air**								**Duplicate**	
Volatile Organic Compounds										
Acetone	7.4 (b)	13 (b)	19.5 (b)	14.2 (b)	31.1 (b)	11.1 (b)	125 (b)	8.6 (b)	9.1 (b)	2,400,000
Benzene	2.3	1.2	1.6	ND	2.5	1.5	4.6	2.8	4.3	1,000
Carbon disulfide	ND	1.9	1.4	2.2	2.8	1.2	3.1	ND	ND	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	3.4	3.5	NA
Chloroform	13.5	3.8	1.5	1.5	55.4	2.8	1.6	1.8	0.85	4,500
1,1-Dichloroethane	ND	14.8	ND	ND	73.9	2	6.5	103	100	850,000
1,1-Dichloroethene	ND	ND	ND	ND	21.8	ND	ND	5.9	5.5	1,000
1,2-Dichloroethane	ND	ND	ND	ND	0.87	ND	4.3	ND	ND	1,000
cis-1,2-Dichloroethene	ND	2.7	ND	ND	ND	ND	ND	1.2	1.3	NA
Ethylbenzene	1.9	2.8	2.8	1.6	2.6	2.8	3.3	1	2.7	1,650,000
2-Hexanone	ND	ND	ND	ND	ND	ND	2.1	ND	ND	NA
Methyl ethyl ketone	1	15.8	20.9	6.7	16.6	9	45.3	3.4	3.8	2,400,000
Methyl Isobutyl Ketone	ND	ND	ND	ND	ND	ND	0.81	ND	ND	140,000
Methylene chloride	9.9	5	4.6	4.8	17.7	5.3	5.5	1.5	1.3	1,200,000
Tetrachloroethlene	ND	134	3.2	2.7	2.3	2.6	ND	10	9.2	11,000
Toluene	15.6	15.9	14.4	8.5	17.2	15.9	17.3	10	18.8	760,000
1,1,1-Trichloroethane	ND	88.2	ND	1.8	483	16.5	7.6	169	157	1,310,000
Trichloroethene	ND	13.1	4.8	12	1.4	4.3	1.4	27.9	26.3	7,000
1,1,2,-Trichloro-1,2,2-Trifluoroethane	31 (b)	37.9 (b)	4.9 (b)	8.5 (b)	186 (b)	65.2 (b)	5.8 (b)	4340 (b, j)	5140 (b, j)	NA
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	3	5.1	1,000
Xylenes (total)	10.8	14.3	14.3	8.7	13.9	14.4	14.5	6	15.6	500,000
Total Volatile TICs	34.3	535	527	370	502	570	748	1301	1263	NA

Notes:

1. All concentrations are reported in ppbv.
2. Only compounds detected in one or more samples are listed in the table.
3. Abbreviations:
   - NA: Not Applicable.
   - b: Compound detected in associated method blank.
   - j: Estimated concentration.

TABLE 3
Summary of January 1999 Hydropunch Sampling Results
Airport Industrial Office Park – Valley Stream, New York

Location	**SB02**	**SB02**	**SB02**	**SB03**	**SB03**	**SB03**	**New York Ground Water Standards**
Sample ID	**SB02-GW01**	**SB02-GW02**	**SB02-GW03**	**SB03-GW01**	**SB03-GW02**	**SB03-GW03**	
Sample Date	**1/9/99**	**1/9/99**	**1/9/99**	**1/10/99**	**1/10/99**	**1/10/99**	
Collection Method	**Hydropunch**	**Hydropunch**	**Hydropunch**	**Hydropunch**	**Hydropunch**	**Hydropunch**	
Depth (feet bgs)	**39.0-39.5**	**51.5-52.0**	**62.5-63.0**	**37.5-38.0**	**52.5-53.0**	**62.5-63.0**	
Comments							
Volatile Organic Compounds							
Bromoform	ND	ND	ND	1.5	ND	ND	NA
Chloroform	**11.6**	5.8	**11**	ND	ND	ND	7
Dibromochloromethane	ND	ND	ND	1.2	ND	ND	5
cis-1,2-Dichloroethene	ND	ND	ND	4.8	2.8	**5.2**	5
Tetrachloroethene	1.9	1.4	3.2	3.8	1.8	3.4	5
Trichloroethene	4.6	**14.7**	4.6	2.7	1.7	3.4	5

Notes:

1. All concentrations are reported in μg/l (parts per billion).
2. Only compounds detected in one or more samples are listed in this table.
3. Bold values exceed the New York Ground Water Standard.
4. Abbreviations:
   ND: Not Detected.
   NA: Not Applicable.

TABLE 4
Summary of On-Site Vertical Delineation Sampling Results
Former Bulova Corporation Facility - Valley Stream, New York

Location	GP05	GP05	GP05	GP05	GP09	GP09	GP09	GP09	MW-HD4	MW-HD6	New York Ground Water Standards
Sample ID	GP05-GW01A	GP05-GW02A	GP05-GW03A	GP05-GW04A	GP09-GW01A	GP09-GW02A	GP09-GW03A	GP09-GW04A	MW-HD4-990420	MW-HD6-990420	
Sample Date	20-Apr-99	20-Apr-99	20-Apr-99	20-Apr-99	19-Apr-99	19-Apr-99	19-Apr-99	19-Apr-99	20-Apr-99	20-Apr-99	
Collection Method	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Bailer	Bailer	
Depth (feet bgs)	6 - 10	36 - 42	52 - 56	72 - 76	6 - 10	42 - 46	53 - 57	72 - 76	6 – 15	6 – 14	
Comments											
Volatile Organic Compounds											
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	3
Dichlorodifluoromethane	ND	ND	ND	ND	4.3	ND	ND	ND	2.8	2.7	5
1,1-Dichloroethane	4.5	ND	ND	ND	**31.9**	1.2	ND	ND	**28.4**	**5.6**	5
1,1-Dichloroethene	ND	ND	ND	ND	**38.4**	ND	ND	ND	**92**	**10.9**	5
cis-1,2-Dichloroethene	4.7	3.8	ND	ND	ND	3.6	ND	ND	2.9	ND	5
Tetrachloroethene	ND	ND	ND	ND	**5.8**	ND	ND	ND	**7.8**	**7.5**	5
1,1,1-Trichloroethane	4.2	ND	ND	ND	**88.3**	ND	ND	ND	**98.2**	**38**	5
Trichloroethene	**21.3**	**5.6**	ND	ND	**23.5**	**11.3**	ND	0.71	**17.2**	**11.1**	5
1,1,2-Trichloro-1,2,2-Trifluoroethane	**12.4**	ND	ND	ND	**412 (e)**	ND	ND	ND	**627 (e)**	**413 (e)**	5
Vinyl chloride	**3.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	2
Total Volatile TICs	84.5	ND	20.4	28.7	78	ND	ND	38	34.7	52.5	NA

Notes:

1. All concentrations are reported in μg/l (parts per billion).
2. Only compounds detected in one or more samples are listed in this table.
3. Bold values exceed the New York Ground Water Standard.
4. Abbreviations:
    - ND: Not Detected.
    - NA: Not Applicable.
    - (e) Value exceeds calibration range.

TABLE 5
Summary of January 1999 Monitoring Well Sampling Results
Former Bulova Corporation Facility - Valley Stream, New York

Location	**MW-HD1**	**MW-HD2**	**MW-HD3**	**MW-HD4**	**MW-HD4**	**MW-HD5**	**MW-HD6**	**New York Ground Water Standards**
Sample Date	**1/8/99**	**1/8/99**	**1/8/99**	**1/8/99**	**1/8/99**	**1/8/99**	**1/8/99**	
Collection Method	**Bailer**	**Bailer**	**Bailer**	**Bailer**	**Bailer**	**Bailer**	**Bailer**	
Comments					**Duplicate**			
Volatile Organic Compounds								
Chlorobenzene	ND	**16.4**	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	**19.3**	ND	0.68	0.6	ND	ND	3
1,3-Dichlorobenzene	ND	0.9	ND	ND	ND	ND	ND	3
1,4-Dichlorobenzene	ND	**41.9**	ND	1.4	1.4	ND	0.99	3
Dichlorodifluoromethane	**6**	ND	ND	ND	ND	ND	ND	5
1,1-Dichloroethane	2.4	ND	ND	**18**	**18.7**	ND	**12.5**	5
1,1-Dichloroethene	ND	ND	ND	**64.8**	**69.4**	ND	**25**	5
1,1,1-Trichloroethane	ND	ND	ND	**80.7**	**83.2**	ND	**86.1**	5
Tetrachloroethene	ND	ND	ND	4.8	**5**	ND	**12**	5
Trichloroethene	ND	ND	ND	**13.6**	**14.6**	ND	**80.6**	5
Trichlorofluoromethane	ND	ND	ND	**302**	**319**	ND	**679**	5

Notes:

1. All concentrations are reported in μg/l (parts per billion).
2. Only compounds detected in one or more samples are listed in this table.
3. Bold values exceed the New York Ground Water Standard.
4. Abbreviations:
   ND: Not Detected.
   NA: Not Applicable.

TABLE 6
Summary of Historical Ground Water Sampling Results
Former Bulova Corporation Facility - Valley Stream, New York

Location	MW-HD1			MW-HD2							MW-HD3						
Sample Collection Date	**3/19/97**	**9/24/98**	**1/8/99**	**5/18/94**	**6/23/94**	**9/5/95**	**3/19/97**	**6/23/97**	**9/24/98**	**1/8/99**	**5/18/94**	**6/23/94**	**9/5/95**	**3/19/97**	**6/23/97**	**9/24/98**	**1/8/99**
Volatile Organic Compounds																	
Chlorobenzene	ND	ND	ND	ND	ND	5	ND	ND	7	16.4	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5	ND	ND	NA	NA	47	ND	ND	ND	19.3	NA	NA	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	NA	NA	ND	ND	ND	ND	0.9	NA	NA	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	NA	NA	96	ND	ND	ND	41.9	NA	NA	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	1	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	5	ND	3	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	7.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.6	32.8	6	4	1.1	4	ND
Trichlorofluoromethane	ND	ND	ND	ND	1.3 (j)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

1. All concentrations are reported in micrograms per liter (μg/L) (parts per billion [ppb]).
2. Only Priority Pollutant compounds detected in one or more samples are listed in this table.
3. Abbreviation:
   ND = Not Detected.
   NA = Not Analyzed.

TABLE 6 (continued)
Summary of Ground Water Sampling Results
Former Bulova Technologies Facility - Valley Stream, New York

Location	MW-HD4										MW-HD5						
Sample Collection Date	5/18/94	6/23/94	9/5/95	3/19/97	6/23/97	9/9/97	11/21/97	9/24/98	1/8/99	4/20/99	5/18/94	6/23/94	9/5/95	3/19/97	6/23/97	9/24/98	1/8/99
Volatile Organic Compounds																	
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	NA	NA	ND	ND	ND	ND	ND	ND	0.68	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	0.9	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	NA	NA	ND	ND	ND	ND	ND	ND	1.4	1	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	34.9	340	26	71.7	78.8	44.7	61	18	28.4	8.81	7.76	2	2	ND	ND	ND
1,2-Dichloroethane	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	120	281	3,000	150	360	640	313	450	64.8	92	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	84	2	ND	ND	ND	28	ND	ND	ND	ND	7	2	ND	3	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	6	18.6	13.6	ND	ND	2.9	ND	ND	ND	ND	0.65	ND	ND
trans-1,2-Dichloroethene	ND	9.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.57	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	2	ND	ND	ND	ND	8	4.8	7.8	113	32.6	1	ND	1.2	ND	ND
Toluene	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	1,010	3,100	16,000	260	929	2,680	572	1,600	80.7	98.2	24.7	37	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	27.4	99.4	800	12	46	163	52.2	120	13.6	17.2	3.68	3.05	4	2	2.3	1	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	302	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	2	ND	ND	ND	ND	1	ND	ND	ND	ND	3	ND	ND	2	ND

Notes:

1. All concentrations are reported in micrograms per liter (μg/L) (parts per billion [ppb]).
2. Only Priority Pollutant compounds detected in one or more samples are listed in this table.
3. Abbreviation:
   ND = Not Detected.
   NA = Not Analyzed.

TABLE 6 (continued)
Summary of Ground Water Sampling Results
Former Bulova Technologies Facility - Valley Stream, New York

Location	MW-HD06				
Sample Collection Date	**7/14/97**	**9/9/97**	**11/21/97**	**1/8/99**	**4/20/9**
Volatile Organic Compounds					
Chlorobenzene	ND	ND	ND	ND	ND
Chloroethane	ND	14	10.8	ND	ND
Chloroform	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	0.99	ND
Dichlorodifluoromethane	ND	ND	ND	ND	2.7
1,1-Dichloroethane	11.8	14.5	9.1	12.5	5.6
1,2-Dichloroethane	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	1.7	ND	25	10.9
1,2-Dichloroethene	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND
Tetrachloroethene	1.0	1.3	ND	12	7.5
Toluene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	8.1	6.6	12.2	86.1	38
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Trichloroethene	2.4	21.6	7	80.6	11.1
Trichlorofluoromethane	ND	ND	ND	679	ND
Vinyl Chloride	ND	ND	ND	ND	ND

Notes:

1. All concentrations are reported in micrograms per liter (μg/L) (parts per billion [ppb]).
2. Only Priority Pollutant compounds detected in one or more samples are listed in this table.
3. Abbreviation:
    ND = Not Detected.
    NA = Not Analyzed.

APPENDIX A

Data Usability Summary Reports

DATA USABILITY SUMMARY REPORT (DUSR)
BULOVA: VALLEY STREAM
SAMPLING EVENTS - JANUARY 1999

I. INTRODUCTION

During these sampling events, a total of 17 aqueous samples, including wash and trip blanks, and one soil sample were collected by ENVIRON and submitted to Accutest Laboratories in Dayton, New Jersey for analysis. The aqueous samples were analyzed for priority pollutant volatile organics (VOC) using USEPA Method 624. The soil was analyzed for waste classification parameters (volatile organics using SW846 Method 8260B, semivolatile organics using SW846 Method 8270, pesticides using SW846 Method 8081A, herbicides using SW846 Method 8150, metals using SW846 Methods 6010B and 7470A, total petroleum hydrocarbons using EPA Method 418.1, and total polychlorinated biphenyls using SW846 Method 8082). Accutest prepared two data packages (Job Numbers E44113 and E44172) using the Category B Deliverables for New York Analytical Services Protocol (ASP).

ENVIRON reviewed the analytical and quality assurance/quality control (QA/QC) results contained in the data packages as well as the raw data. The data validation procedure and criteria were based on the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (February 1994), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (February 1994) and the appropriate methods where applicable. The USEPA data qualifiers used in this report are listed in Table 1.

Overall, the data is acceptable. The data packages provided by Accutest meet the requirements for a DUSR. No data transfer deviations were identified.

The description of the data review is in Section II and summarizes the problems detected that required the qualification of data. All samples were successfully analyzed for the requested analyses, except for the reporting limit for acrolein which should be adjusted to 50 ug/l. Some data were qualified as estimated ("J") due to problems with the leachate spike.

TABLE 1
Data Qualifier Definitions

The following definitions provide brief explanations of the national qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above, the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of any analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

II. DATA REVIEW

VOLATILE ORGANIC ANALYSIS
(USEPA Methods 624/8260B)

A. Technical Holding Time

The holding time requirement was met for all samples.

B. Instrument Performance Check

All field samples were analyzed within the 12 hour period following the injection of the BFB. Method 624 requires analysis within 24 hours of the instrument performance check.

C. Calibration

Initial Calibration

Method 624: The average relative response factor (RRF) for acrolein is less than 0.05. The reporting limit for acrolein is considered unreliable and qualified "R." The reporting limit should be raised to 50 ug/l which is the lowest standard for acrolein analyzed in association with these field samples.

Continuing Calibration

No problems requiring data qualification were identified during this review.

Method 8260B (Leachate): The percent difference (%D) exceeded 25% for 2-butanone for the continuing calibration standard analyzed 1/14/99 (10:22 am, instrument GCMSO). The compound that exceed 25% was not reported in the associated field samples.

C. Blanks

No problems were identified during this review.

D. Surrogate Standards

No problems requiring the qualification of data were identified during this review.

E. Matrix Spike/Matrix Spike Duplicate/Blank Spike (MS/MSD/BS)

The MS/MSD/BS analyses are used to determine long-term precision and accuracy of the analytical method for various matrices and/or sites. MS/MSD analyses are not used by themselves to qualify data points but are used in conjunction with other QC data to determine data usability issues.

Job Number E44113: 2-Chloroethyl vinyl ether was not recovered (less than 1%) in either the matrix spike or the matrix spike duplicate. It was recovered within the control limits for the blank spike. The sample used for the batch QA/QC was not from the field samples associated with this site. Data qualification is not required based on the MS/MSD/BS analyses.

The percent recovery for acrolein exceeded the upper control limit for the matrix spike/matrix spike duplicate/blank spike analyses. Acrolein was not detected in the associated field samples. Data qualification is not required based on the MS/MSD/BS analyses.

Job Number E44172: 2-Chloroethyl vinyl ether was not recovered (less than 1%) in either the matrix spike or the matrix spike duplicate. It was recovered within the control limits for the blank spike. The sample used for the batch QA/QC was not from the field samples associated with this site. Data qualification is not required based on the MS/MSD/BS analyses.

The percent recovery for acrolein exceeded the upper control limit for the blank spike analyses. Acrolein was not detected in the associated field samples. Data qualification is not required based on the MS/MSD/BS analyses.

Job Number E44172 (TCLP analysis - includes Leachate Spike): There are several percent recoveries which fall outside the control limits for the MS/MSD/BS analyses associated with the TCLP sample. However, a leachate spike for this sample **(WC01-SS01)** was provided by the laboratory. Issues detected with the leachate spike take precedence over those detected with the MS/MSD/BS analyses, as long as no systemic problems are identified.

The percent recoveries for the leachate spike for benzene, 2-butanone, and 1,1-dichloroethene exceed the upper control limit. These compounds were not detected in the sample. Data qualification is not required.

F. Internal Standards

No problems requiring the qualification of data were identified during this review.

G. Compound Identification, Quantitation and Detection Limits

No problems were identified during this review.

H. Overall Data Assessment

Data quality is acceptable. Note that a number of compounds were manually integrated in the field samples and the laboratory QA/QC samples including the calibration standards and MS/MSD/BS.

SEMIVOLATILE ORGANIC COMPOUNDS
(SW846 Method 8270)

A. Technical Holding Time
The holding time requirement met for all samples.

B. Calibration Standards
Initial: No problems were identified during this review.

Continuing: No problems were identified during this review.

C. Blanks
No problems were identified during this review.

D. Surrogate Standards
No problems were identified during this review.

E. Leachate Spike (LS)
The percent recoveries for 2,4,6-trichlorophenol, 2,4-dinitrotoluene, and hexachlorobutadiene were below the lower control limits. The reporting limits for these compounds for sample **WC01-SS01** are estimated and qualified "UJ".

F. Internal Standards
No problems were identified during this review.

G. Compound Identification, Quantitation and Detection Limits
No problems were identified during this review.

H. Overall System Performance
No problems were identified during this review.

PESTICIDES/HERBICIDES
(SW846 Methods 8081A/8150)

A. **Technical Holding Time**
The holding time requirement met for all samples.

B. **Calibration Standards**
Initial: No problems were identified during this review.

Continuing: No problems were identified during this review.

C. **Blanks**
No problems were identified during this review.

D. **Surrogate Standards**
No problems were identified during this review.

E. **Leachate Spike (LS)**
No problems were identified during this review.

F. **Compound Identification, Quantitation and Detection Limits**
No problems were identified during this review.

G. **System Performance**
No problems were identified during this review.

POLYCHLORINATED BIPHENYLS
(SW846 Method 8082)

A. **Technical Holding Time**
The holding time requirement met for all samples.

B. **Calibration Standards**
Initial: No problems were identified during this review.

Continuing: No problems were identified during this review.

C. **Blanks**
No problems were identified during this review.

D. **Surrogate Standards**
No problems were identified during this review.

E. **Matrix Spike/Matrix Spike Duplicate/Blank Spike (MS/MSD/BS)**
The MS/MSD/BS analyses are used to determine long-term precision and accuracy of the analytical method for various matrices and/or sites. MS/MSD analyses are not used by themselves to qualify data points but are used in conjunction with other QC data to determine data usability issues.

No problems requiring data qualification were identified during this review.

F. **Compound Identification, Quantitation and Detection Limits**
No problems were identified during this review.

G. **System Performance**
No problems were identified during this review.

METALS
(SW846 Method 6010B/7470A)

A. **Technical Holding Time**
The holding time requirement was met for these samples.

B. **Calibration**
No problems requiring data qualification were identified during this review.

C. **Blanks**
No problems were identified during this review.

D. **Matrix Spike/Matrix Spike Duplicate**
No problems were identified during this review.

E. **MS/MSD Duplicate/Laboratory Duplicate**
No problems were identified during this review.

F. **Laboratory Control Sample**
No problems were identified during this review.

G. **Interference Check Sample**
No problems were identified during this review.

H. **ICP Serial Dilution**
No problems were identified during this review.

I. **Overall Data Assessment**
Data quality is acceptable.

TOTAL PETROLEUM HYDROCARBONS
(Method EPA 418.1)

A. **Technical Holding Times**
The holding time requirement were met for these samples.

B. **Blanks**
No problems were identified during this review.

C. **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**
No problems were identified during this review.

D. **Laboratory Control Sample**
No problems were identified during this review.

E. **Detection Limits**
No problems were identified during this review.

02-1961A:PRIN_WP\10692v1.DOC

DATA USABILITY SUMMARY REPORT (DUSR)
BULOVA: VALLEY STREAM
SAMPLING EVENTS - JUNE 1998

I. INTRODUCTION

During these sampling events, a total of 12 aqueous samples, including wash and trip blanks, and nine air sample were collected by ENVIRON and submitted to Accutest Laboratories in Dayton, New Jersey for analysis. The aqueous samples were analyzed for priority pollutant volatile organics (VOC) using USEPA Method 624. The air samples were analyzed for VOCs using USEPA TO14. Accutest prepared two data packages (Job Numbers E48617 and E48636) using the Category B Deliverables for New York Analytical Services Protocol (ASP).

ENVIRON reviewed the analytical and quality assurance/quality control (QA/QC) results contained in the data packages as well as the raw data. The data validation procedure and criteria were based on the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (February 1994), and the appropriate methods where applicable. The USEPA data qualifiers used in this report are listed in Table 1.

Overall, the data is acceptable. The data packages provided by Accutest meet the requirements for a DUSR. No data transfer deviations were identified.

The description of the data review is in Section II and summarizes the problems detected that required the qualification of data. All samples were successfully analyzed for the requested analyses. Some data were qualified as estimated ("J") due to possible laboratory contamination.

TABLE 1
Data Qualifier Definitions

The following definitions provide brief explanations of the national qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above, the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of any analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

II. DATA REVIEW

VOLATILE ORGANIC ANALYSIS
(USEPA Methods 624)

A. Technical Holding Time

The holding time requirement was met for all samples.

B. Instrument Performance Check

All field samples were analyzed within the 24 hour period following the injection of the BFB. Method 624 requires analysis within 24 hours of the instrument performance check.

C. Calibration

Initial Calibration

No problems were identified during this review.

Continuing Calibration

No problems requiring data qualification were identified during this review.

D. Blanks

No problems were identified during this review.

E. Surrogate Standards

No problems requiring the qualification of data were identified during this review.

F. Matrix Spike/Matrix Spike Duplicate/Blank Spike (MS/MSD/BS)

The MS/MSD/BS analyses are used to determine long-term precision and accuracy of the analytical method for various matrices and/or sites. MS/MSD analyses are not used by themselves to qualify data points but are used in conjunction with other QC data to determine data usability issues.

No problems requiring the qualification of data were identified during this review.

G. Internal Standards

No problems requiring the qualification of data were identified during this review.

H. Compound Identification, Quantitation and Detection Limits

No problems were identified during this review.

I. Overall Data Assessment

Data quality is acceptable.

VOLATILE ORGANIC COMPOUNDS
(USEPA Method TO14)

A. Technical Holding Time

The holding time requirement met for all samples.

B. Calibration Standards

Initial: No problems were identified during this review.

Continuing: No problems were identified during this review.

C. Blanks

Freon 113 was reported in all associated method blanks. Freon 113 could be considered a common laboratory contaminant because of its use as a solvent in common laboratory analyses. Therefore the 10 times rule would apply. The following Freon 113 results should be considered probable laboratory artifact because the reported concentration is less than 10 times the associated blank: **GP13-SG01, GP05-SG01, GP02-SG01**.

Note that the Freon 113 result for sample **GP08-SG01** is valid, even though it is reported from a dilution analysis where the on-column Freon 113 is less than 10 times the associated blank. Both the undiluted analysis and the dilution analysis have similar concentrations (162 ppbv for the undiluted analysis versus 186 ppbv for the dilution analysis).

Acetone was detected in some associated method blanks. However, the field sample concentrations were, in all cases, greater than 10 times that detected in the method blank.

D. Surrogate Standards

No problems were identified during this review.

E. Laboratory Control Sample

No problems were identified during this review.

F. Internal Standards

No problems were identified during this review.

G. Compound Identification, Quantitation and Detection Limits

GP15-SG01: The Freon 113 result is estimated and qualified "J" with a probable high bias. This sample was analyzed three times; undiluted, eight times dilution, and 400 times dilution. The Freon 113 result was reported from the 400 times dilution. The Freon 113 result from the undiluted analysis is 100 ppbv; from the eight times, 1100 ppbv (on-column concentration is 139 ppbv); and from the 400 times dilution, 4340 ppbv (on-column concentration 10.8 ppbv). The increase in concentrations is not reasonable and suggests that the high Freon 113 values may partly be the result of laboratory contamination. Note that the concentrations for 1,1-dichloroethane and 1,1,1-trichloroethane are consistent through the three analyses.

GP15-SG11: The Freon 113 result is estimated and qualified "J" with a probable high bias. This sample was analyzed two times, undiluted and 400 times dilution. The Freon 113 result was reported from the 400 times dilution. The Freon 113 result from the undiluted analysis is 310 ppbv, and from the 400 times dilution, 5140 ppbv (on-column concentration 12.9 ppbv). The increase in concentration is not reasonable and suggests that the high Freon 113 value may partly be the result of laboratory contamination. Note that the concentrations for 1,1-dichloroethane and 1,1,1-trichloroethane are consistent in both analyses.

H. Overall System Performance

No problems were identified during this review.

02-1961A:PRIN_WP/11255v1.DOC

APPENDIX B

Soil Boring Logs

BORING SB-2
PERMIT# N/A
DATE: Jan. 9, 1999
LOGGED BY: M. Potts
DRILLING CO.: Advanced Drilling
DRILLER: R. Logel

RIG: Gefco S-15
METHOD: Hollow-Stem Auger
BORING DIA.: 8-Inch
BORING DEPTH: 65 Ft
DEPTH TO WATER:
SURFACE ELEV.: N/A

ENVIRON
BORING LOG

PROJECT: Bulova: Valley Stream
Valley Stream, NY
CASE # 02-1961A

COMMENTS:

LOG\1961AL01

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	USCS SYMBOL	GRAPHIC LOG	CLASSIFICATION	REMARKS
					NA			Asphalt And Sub-Base = 0-0.5 Ft
		6,10,13,10	15	4" Red-Brown, Fine To Medium SAND Trace Silt Damp				
				11" Lt Brown, Fine To Medium SAND, Damp				
		5,5,5,7	13	Lt Brown, Fine To Medium SAND Trace Sand Trace Fine Gravel, Wet				
10		8,11,11,8	15					Flakes Of Muscovite In Sample
		2,3,3,7	12					Oxidized Sand Lenses
20		6,7,6,8	10					
30							Upper Pleistocene	
		8,6,12,10	16					
					sw			Collect Hydropunch Ground Water Sample SB02-GW01@39-39.5 Ft
40		5,20,8,14	0	4" Fine To Medium SAND Some Coarse Sand Some Gravel				
		7,13,19,18	12	8" Same As Above 11" Lt Brown, Fine To Coarse SAND				
		11,12,13,13	18	7" Gray CLAY, Damp				
		3,4,6,7	15	Blue-Gray CLAY, Damp	cl		20-Ft clay	Numerous Lenses Of Dark Brown Organic Matter (Peat?)
		4,5,7,8	6					
50				Dark Gray SILTY FINE SAND Trace Clay, Wet			Upper Pleist-ocene	Collect Hydropunch Ground Water Sample SB02-GW01@51.5-52 Ft
		8,12,12,20	12					
		3,3,5,5	6	Green-Gray, Fine SAND Trace Medium Coarse Sand, Wet				
		5,3,5,7	12	Gray, SILTY FINE SAND Trace, Silt SAND, Trace Clay	sm		Gardiners Clay (?)	
60		2,2,3,8	8					
		9,9,17,24	7					
		·	·					Collect Hydropunch Ground Water Sample SB02-GW03 @62.5-63 Ft
		7,7,11,11	8					
				Bottom of boring @ 65 Ft				

BORING SB-3

PERMIT# N/A

DATE: Jan. 10, 1999

LOGGED BY: M. Potts

DRILLING CO.: Advanced Drilling

DRILLER: R. Logel

RIG: Gefco SS-15

METHOD: 4 1/4 Inch Hollow-Stem Auger

BORING DIA.: 8-Inch

BORING DEPTH: 65 Ft

DEPTH TO WATER:

SURFACE ELEV.: N/A

ENVIRON
BORING LOG

PROJECT: Bulova: Valley Stream
Valley Stream, NY

CASE # 02-1961A

COMMENTS:

LOG\1961AL02

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	USCS SYMBOL	GRAPHIC LOG	CLASSIFICATION	REMARKS
								Asphalt And Sub-Base = 0-0.5 Ft
10								
20								
					sw		Upper Pleistocene	
30		12,7,11,13	8	Lt. Brown, Fine To Medium SAND Trace Coarse Sand, Wet				
		5,3,5,4	8					
								Collect Hydropunch Ground Water Sample SB03-GW01@37.5-38 Ft
40		7,8,13,16	10					
		6,6,11,13	3	Gray, Fine SAND Some Silt	sm			
		6,2,2,3	14	Gray CLAY Trace Silt, Damp			20-Ft Clay	Several Lenses Of Dark Brown Organic Matter (Peat?)
		3,4,6,4	8		cl			
		4,4,4,4	14					
50		2,1,2,2	12	8" Same As Above 4" Gray SILTY FINE SAND Trace Clay Trace Medium Sand Wet			Upper Pleist-ocene	Flakes Of Muscovite In Sample Collect Hydropunch Ground Water Sample SB03-GW02@52.5-53 Ft
		5,8,11,14	14					
		4,15,15,22	1	Green, FINE SAND Trace Silt Trace Medium Sand, Wet	sm		Gardiners Clay (?)	
		0,2,3,5	7	Greenish-Gray, SILTY FINE SAND Trace Clay, Wet				
60		8,8,12,15	0					
								Collect Hydropunch Ground Water Sample SB03-GW03 @62.5-63 Ft
		4,3,5,7	10	Gray, SILTY FINE SAND Trace Clay, Moist				
				Bottom of Boring @65 Ft				

APPENDIX C

Field Parameter Measurements

TABLE C-1
Former Bulova Corporation Facility
Ground Water Field Sampling Information
January 8, 1999

SAMPLE POINT ID	MW-HD1	MW-HD2	MW-HD3	MW-HD4	MW-HD5	MW-HD6
Date	1/8/99	1/8/99	1/8/99	1/8/99	1/8/99	1/8/99
Weather Conditions	snow/ice	snow/ice	snow/ice	snow/ice	snow/ice	snow/ice
PID Reading (ppm)	0.0	0.0	0.0	0.0	0.0	0.0
Free Product Thickness	NA	NA	NA	NA	NA	NA
Total Depth (ft)	17.3	13.9	14.87	14.45	14.60	13.96
Depth to Water (ft)	5.69	4.99	5.71	6.11	5.40	6.05
Height Water Column (ft)	11.61	8.91	9.16	8.34	9.20	7.91
One Casing Volume (gal.)	7.6	5.8	6.0	5.5	6.0	1.3
Three Volumes (gal.)	23	17.5	18	16.5	18	3.9
Actual Purge Volume (gal.)	24	18	19	17	19	4
Purge Start Time	1045	0953	0911	1242	1140	1219
Purge End Time	1115	1013	0934	1305	1200	1227
Flow Rate (gpm)	~1.0	~1.0	~1.0	~1.0	~1.0	~0.5
Date Sampled	1/8/99	1/8/99	1/8/99	1/8/99	1/8/99	1/8/99
Time Sampled	1120	1017	0940	1312	1207	1233
Purge Method	PP	PP	PP	PP	PP	PP
Sampling Method	TB	TB	TB	TB	TB	TB
Depth to Water After Purge (ft)	5.69	5.03	5.72	6.11	5.40	6.05
Depth to Water Before Sampling (ft)	5.69	4.99	5.71	6.11	5.40	6.05
FIELD PARAMETERS						
Prior to Purging						
pH	5.81	5.87	4.99	6.32	6.71	6.70
Specific Conductance (μs/cm)	0.494	0.419	0.429	0.289	0.509	0.240
Temperature (°C)	13.4	12.7	13.5	15.8	13.8	13.1
Dissolved Oxygen (ppm)	1.86	2.24	1.72	1.79	1.35	2.23
After Purging						
PH	6.31	5.86	5.91	6.52	6.91	6.13
Specific Conductance (μs/cm)	0.437	0.428	0.402	0.293	0.488	0.239
Temperature (°C)	14.4	14.7	15.0	16.8	14.8	14.2
Dissolved Oxygen (ppm)	1.24	1.33	1.27	1.22	1.34	1.66
After Sampling						
PH	6.55	5.85	6.02	6.37	7.21	6.60
Specific Conductance (ms/cm)	0.477	0.416	0.436	0.297	0.533	0.225
Temperature (°C)	11.7	12.0	13.0	14.7	11.8	11.8
Dissolved Oxygen (ppm)	2.95	2.71	2.65	2.70	2.81	2.87
Comments						

SAMPLING/PURGE METHOD
FP = free product
OD = odor observed from purge water
NS = not sampled
TB = teflon bailer
SP = submersible pump
PP = peristaltic pump
* = well purged dry